# Converged Address Book (CAB) Specification

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**Open Mobile Alliance**

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# Contents

# Figures

# Tables

# 1. Scope

This document provides the Technical Specification of the CAB Enabler to fulfil the requirements outlined in the Converged Address Book Requirements document [CAB RD] for CAB V1.0 and in compliance to the architecture described in Converged Address Book Architecture document [CAB AD]. The Technical Specification provides the definition of data elements of the CAB Enabler and the description of the procedures for the features supported by the CAB Enabler.

Additionally, this document describes a set of detailed flows for the functionalities of the CAB Enabler. These flows explain the system concepts in a graphical manner and describe the relationships between the functional components of the CAB Enabler architecture.

# 2. References

## 2.1 Normative References

| | |
|---|---|
| **[CAB AD]** | "Converged Address Book Architecture", Version 1.0, Open Mobile Alliance™, OMA-AD-CAB-V1_0, URL:http://www.openmobilealliance.org/ |
| **[CAB RD]** | "Converged Address Book Requirements", Version 1.0, Open Mobile Alliance™, OMA-RD-CAB-V1_0, URL:http://www.openmobilealliance.org/ |
| **[CAB MO]** | "Converged Address Book Management Object", Version 1.0, Open Mobile Alliance™, OMA-TS-CAB-MO-V1_0, URL:http://www.openmobilealliance.org/ |
| **[CAB XDMS]** | "Converged Address Book XDM Specification", Version 1.0, Open Mobile Alliance™, OMA-TS-CAB-XDMS-V1_0, URL:http://www.openmobilealliance.org/ |
| **[OMA CPM CONV FCT TS]** | "CPM Conversation Functions", Version 1.0, Open Mobile Alliance™, OMA-TS-CPM_Conv_Fnct-V1_0, URL:http://www.openmobilealliance.org/ |
| **[OMA CPM IWF TS]** | "CPM Interworking", Version 1.0, Open Mobile Alliance™, OMA-TS-CPM_Interworking-V1_0, 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 DS DevInf]** | "OMA DS Device Information", Version 1.2, Open Mobile Alliance™, OMA-TS-DS_DevInf-V1_2, URL:http://www.openmobilealliance.org/ |
| **[OMA DS Pro]** | "DS Protocol", Version 1.2.2, Open Mobile Alliance™, OMA-TS-DS_Protocol-V1_2_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/ |
| **[OMA XDM Core]** | "XML Document Management Specification", Version 2.1, Open Mobile Alliance™, OMA-TS-XDM_Core-V2_1, URL:http://www.openmobilealliance.org/ |
| **[OMA XDM List]** | "List XDM Specification", Version 2.1, Open Mobile Alliance™, OMA-TS-XDM_List-V2_1, URL: http://www.openmobilealliance.org/ |
| **[OMA XDM RD]** | "XML Document Management Requirements", Version 2.1, Open Mobile Alliance™, OMA-RD-XDM-V2_1, URL:http://www.openmobilealliance.org/ |
| **[OMA XDM UPP]** | "UPP Directory XDM Specification"; Open Mobile Alliance™, OMA-TS-XDM_UPP_Directory-V1_0, 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 |
| **[RFC2425]** | A MIME Content-Type for Directory Information. T. Howes, M. Smith, F. Dawson. September 1998. URL: http://www.ietf.org/rfc/rfc2425.txt |
| **[RFC2426]** | vCard MIME Directory Profile. F. Dawson, T. Howes. September 1998.URL: http://www.ietf.org/rfc/rfc2426.txt |
| **[RFC4660]** | IETF RFC 4660 "Functional Description of Event Notification Filtering", H. Khartabil et al., September 2006 URL: http://www.ietf.org/rfc/rfc4660.txt |
| **[RFC4661]** | IETF RFC 4661 "An Extensible Markup Language (XML)-Based Format for Event Notification Filtering", H. Khartabil et al,, September 2006 URL: http://www.ietf.org/rfc/rfc4661.txt |
| **[SCRRULES]** | "SCR Rules and Procedures", Open Mobile Alliance™, OMA-ORG-SCR_Rules_and_Procedures, URL:http://www.openmobilealliance.org/ |
| **[vCard2.1]** | "vCard The Electronic Business Card Version 2.1", A versit Consortium Specification, September 18, 1996URL: http://www.imc.org/pdi/vcard-21.doc |
| **[XSD cab pcc]** | "XML Schema Definition: CAB Personal Contact Card document", Version 1.0, Open Mobile Alliance™, OMA-SUP-XSD_cab_pcc-V1_0, URL: http://www.openmobilealliance.org/ |

| | |
|---|---|
| **[XSD extSearch]** | "XML Schema Definition: CAB Search Document extension for External Directories", Version 1.0, Open Mobile Alliance™, OMA-SUP-XSD_cab_search_external_directories-V1_0, URL: http://www.openmobilealliance.org/ |

## 2.2 Informative References

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|---|---|
| **[OMADICT]** | "Dictionary for OMA Specifications", Version 2.8, Open Mobile Alliance™, OMA-ORG-Dictionary-V2_8, URL:http://www.openmobilealliance.org/ |
| **[OMA Pres]** | "OMA Presence SIMPLE", Version 2.0, Open Mobile Alliance™, URL:http://www.openmobilealliance.org/ |
| **[OMA Pres TS]** | "OMA Presence SIMPLE Specification", OMA-TS-Presence_SIMPLE-V2_0, Open Mobile Alliance™, URL:http://www.openmobilealliance.org/ |
| **[OMA PDE]** | "OMA Presence SIMPLE Data Extensions V1.3" , Open Mobile Alliance™, 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** | See [CAB AD]. |
| **Access Permissions** | See [OMA XDM RD]. |
| **Access Permissions Document** | See [OMA XDM AD]. |
| **Active User Preferences Profile** | See [OMA XDM RD]. |
| **Address Book** | See Converged Address Book in [CAB RD]. |
| **Application Unique ID** | See [OMA XDM Core]. |
| **Application Usage** | See [OMA XDM Core]. |
| **CAB Client** | See [CAB AD]. |
| **CAB Feature Handler Document** | See [CAB AD]. |
| **CAB Format** | An XML format containing a set of attributes representing contact information. |
| **CAB Server** | See [CAB AD]. |
| **CAB User** | See [CAB RD]. |
| **CAB User Preferences** | See [CAB AD]. |
| **CAB User Preferences Document** | See [CAB AD]. |
| **CAB Server** | See [CAB AD]. |
| **CAB XDMS** | See [CAB AD]. |
| **Contact Entry** | See [CAB RD]. |
| **Contact Share** | See [CAB RD]. |
| **Contact Status** | See [CAB AD]. |
| **Contact Subscription** | See [CAB RD]. |
| **Contact View** | See [CAB RD]. |
| **Cross-Network Proxy** | See [OMA XDM AD]. |
| **Document Reference** | See [OMA XDM AD]. |
| **Document Selector** | See [OMA XDM Core]. |
| **Data synchronization protocol** | See [OMA DS Pro]. |
| **DS Client** | See Client [OMA DS]. |
| **DS Server** | See Server [OMA DS]. |
| **Enabler** | See [OMADICT]. |
| **External Directories** | See [CAB AD]. |
| **Forward XDCP Request** | See [OMA XDM Core]. |
| **Forwarding Notification List Document** | See [OMA XDM List]. |

| | |
|---|---|
| **Global Document** | See [OMA XDM Core]. |
| **Global Tree** | See [OMA XDM Core]. |
| **History Information** | See [OMA XDM AD]. |
| **Legacy Formats** | See [CAB RD]. |
| **Limited XQuery over HTTP** | See [OMA XDM AD]. |
| **Management Object** | See [OMA DM TND]. |
| **Non-CAB address book system** | See [CAB AD]. |
| **Non-CAB User** | See [CAB AD]. |
| **Personal Contact Card** | See [CAB RD]. |
| **PCC Document** | See [CAB AD]. |
| **Principal** | See [OMADICT]. |
| **Published Contact Card** | See [CAB RD]. |
| **Request History Information Document** | See [OMA XDM Core]. |
| **Request-URI** | See [OMA XDM Core]. |
| **UPP Directory** | Use definition from [OMA XDM RD]. |
| **UPP Directory Document** | Use definition from [OMA XDM RD]. |
| **URI** | See [OMA XDM Core]. |
| **User Directory Document Selector** | See [OMA XDM Core]. |
| **Users Tree** | See [OMA XDM Core]. |
| **Search Document** | See [OMA XDM Core]. |
| **Search Proxy** | See [OMA XDM AD]. |
| **Search Request** | See [OMA XDM Core]. |
| **SIP MESSAGE** | The SIP method MESSAGE as defined by [RFC3428] |
| **SIP NOTIFY** | See [OMA XDM Core]. |
| **SIP SUBSCRIBE** | See [OMA XDM Core]. |
| **SIP URI** | See [OMA XDM Core]. |
| **Subscription Proxy** | See [OMA XDM AD]. |
| **XDCP Document** | See [OMA XDM Core]. |
| **XDCP Response** | See [OMA XDM Core]. |
| **XDCP Request** | See [OMA XDM Core]. |
| **XDM Agent** | See [OMA XDM AD]. |
| **XDM Client** | See XDMC in [OMA XDM AD]. |
| **XDM Document** | See [OMA XDM RD] |
| **XDM Preferences Document** | See [OMA XDM Core]. |
| **XDM Resource** | See [OMA XDM RD] |
| **XDMS** | See [OMA XDM AD]. |

## 3.3 Abbreviations

| | |
|---|---|
| **AB** | Address Book |
| **AUID** | Application Unique ID |

| | |
|---|---|
| **CAB** | Converged Address Book |
| **DM** | Device Management |
| **DS** | Data Synchronization |
| **DTD** | Document Type Definition |
| **HTTP** | Hyper Text Transfer Protocol |
| **IP** | Internet Protocol |
| **OMA** | Open Mobile Alliance |
| **PCC** | Personal Contact Card |
| **SCR** | Static Conformance Requirement |
| **SIP** | Session Initiation Protocol |
| **UPP** | User Preferences Profile |
| **URI** | Uniform Resouce Identifier |
| **XCAP** | XML Configuration Access Protocol |
| **XDCP** | XDM Command Protocol |
| **XDM** | XML Document Management |
| **XDMC** | XML Document Management Client |
| **XDMS** | XML Document Management Server |
| **XML** | eXtensible Markup Language |
| **XQuery** | XML Query |
| **XUI** | XCAP User Identifier |

# 4. Introduction (Informative)

The CAB Technical Specification provides the CAB User with the features described in sub clause 4.1 "*Version 1.0*". The CAB Technical Specification utilizes the technologies of data management and synchronization [OMA DS Pro] and XML document management [OMA XDM Core] to fulfil CAB requirements [CAB RD] and is based on CAB architecture described in the [CAB AD].

## 4.1 Version 1.0

CAB Technical Specification version 1.0 supports the following features as described in [CAB AD] sub clause 4.1:

1) Management of AB
2) Management of PCC
3) Contact Subscription
4) Notifications and status information
5) Sharing contact information
6) Searching contact information
7) Exposure of CAB information to external Enablers
8) Interaction with Non-CAB address book systems

# 5. Procedures at CAB Server

The CAB Server SHALL support the procedures described in the following sub clauses.

## 5.1 AB Synchronization Function

The CAB Server SHALL use OMA Data synchronization protocol [OMA DS Pro] as specified in CAB-1 interface [CAB AD] to synchronize the data modifications in the AB or subsets of AB with the CAB Client. .

The CAB Server SHALL support AB CAB Format for AB synchronization with CAB Client. In addition to the AB CAB Format, the CAB Server SHALL support the synchronization of Legacy Formats vCard 2.1 [vCard 2.1], and vCard 3.0 [RFC2425] [RFC2426]. Uses of vCard 2.1 and vCard 3.0 in synchronization are specified in

- sub clauses 5.3.26 "*ParamName*" to 5.3.29 "*ProbParam*" of [OMA DS DevInf] in terms of properties and parameters, and
- sub clause 8 "*Base Media and Content formats*" of [OMA DS] in terms of MIME type.

For synchronization of vCard 2.1 and vCard 3.0 formats, format adaptation is required. The CAB server SHALL perform the mapping as specified in sub clause 5.4.3 "*Format Adaptation*".

Note: The use of the Legacy Formats will result in reduced support of the contact information provided by the AB Application Usage.

The CAB Server SHALL act as a XDM Agent (see sub clause 5.5 *"XDM Agent")* to manage (e.g. retrieve, create, modify, delete) AB Document.

After successfully receiving address book changes from the CAB Client as part of the synchronization sequence, and if there is resulting data to be updated in the AB Application Usage, the CAB Server SHALL update the AB Application Usage before completing the procedure of OMA Data synchronization, i.e. prior to sending the [OMA DS Pro] message (Pkg #6) with the map acknowledgement to the CAB Client, or if Pkg #5 and Pkg #6 are not required, prior to sending Pkg #4.

The CAB Server SHALL use "Server Alerted Sync" as defined in [OMA DS Pro], sub clause 12 "*Server Alerted Sync*", to alert the CAB Client to initiate synchronization, when there are data updates in the AB Application Usage.

## 5.2 Contact Subscription Function

The Contact Subscription function is responsible for handling CAB User's subscription requests towards other CAB Users and data resulting from Contact Subscription updates,.

The Contact Subscription SHALL use XDM Agent (see sub clause 5.5 "*XDM Agent*") to retrieve the list of contacts (through either by document management operations or subscribing to changes to the CAB User Preferences Document [CAB XDMS]) to which it must establish Contact Subscription(s), from the CAB User Preferences Application Usage, with the following clarifications:

1) SHALL use auid "org.openmobilealliance.cab-user-prefs".
2) SHALL obtain the value of the 'id' attribute of <entry> elements included in entries of the <subscription-list> element, from the CAB User Preferences Document [CAB XDMS].
3) SHALL use the value of the 'id' attribute of <entry> elements to create PCC subscription request(s) directly to the PCC Application Usage or via Subscription Proxy as described in [OMA XDM Core].

If a <filter-set> element per [RFC4661] is associated with the 'id' attribute of <entry> element, then the Contact Subscription Function SHALL include the <filter-set> element in a MIME type "application/simple-filter+xml" [RFC4661] in the SIP SUBSCRIBE, in accordance with XML document change subscription procedures for an XDM Agent in sub clause 6.1.2 "*Subscribing to Changes in the XDM Resources*" of [OMA XDM Core].

When the CAB Client (via XDMC) changes a <filter-set> element in an <entry> of the <subscription-list> element, the Contact Subscription Function SHALL restart the backend SIP subscription.

The Contact Subscription SHALL use XDM Agent, (see sub clause 5.5 "*XDM Agent*"), to generate subscription request(s) (via SIP SUBSCRIBE) towards the PCC Application Usage [CAB XDMS] of each of the contact(s) retrieved from <subscription-list>. These subscriptions SHALL be done directly to the PCC Application Usage or via Subscription Proxy as described in [OMA XDM Core].

In case the CAB User to which the Contact Subscription needs to be established is not a contact in the AB Document, the Contact Subscription SHALL add it as a new Contact Entry in AB Document and then it SHALL generate the Contact Subscription.

Upon receiving an incoming notification for a contact's PCC update from a PCC Application Usage (via SIP NOTIFY), the Contact Subscription function:

1) SHALL use <contact-subscription-update> element from CAB User Preferences Document [CAB XDMS] to identify how to process the incoming update, and the following procedures SHALL be applied:
    a) When <contact-subscription-update> element is "true", Contact Subscription Function SHALL update AB Document in [CAB XDMS] with the resulting changes. If the CAB User Preferences element <notify-on-contact-subscription-update> is set to 'true' then the Contact Subscription Function SHALL set in the AB Document the <updated> element value to "contact subscription".
    b) When <contact-subscription-update> element is "false", Contact Subscription function SHALL store the delta changes to a new <contact> element in AB Document, and SHALL set the <temporary> element to "contact subscription", SHALL set 'contactIdRef' attribute to the reference of the Contact Entry to which the temporary contact entry type is associated with.

The Contact Subscription Function SHALL set the <contact-status> in the AB Document in [CAB XDMS]:

1) The value of the <contact-subscription status> element:
    a) <contact-subscription-status> = "active", when the value of the "Subscription-State" header of the SIP NOTIFY contains the value "active", meaning that the subscription has been accepted and has been authorized by the contact.
    b) <contact-subscription-status> = "pending", when the value of the "Subscription-State" header of the SIP NOTIFY contains the value "pending", meaning that the subscription has been received, but that the information in the contact's PCC Access Permissions is insufficient to accept or deny the subscription.
    c) <contact-subscription-status> = "denied", when the value of the "Subscription-State" header of the SIP NOTIFY contains the value "terminated" and the reason code is "rejected", or when the Contact Subscription Function receives a SIP "403 Forbidden" or "603 Decline" response, meaning that the subscription is not allowed by the CAB User's access permission or service provider policy and the subscription is not active.
    d) <contact-subscription-status> = "invalid_filter", when the Contact Subscription Function receives a SIP "488 Not Acceptable Here" response per [RFC4660] or when the Contact Subscription Function receives a SIP NOTIFY response per [RFC4660] with a event-reason-value of value "badfilter".
    e) <contact-subscription-status> = "not_found", when the value of the "Subscription-State" header of the SIP NOTIFY contains the value "terminated" and the reason code is "noresource", or when the Contact Subscription Function receives a "404 Not Found" error code, meaning that the contact could not be identified as a CAB User and the subscription is not active.
    f) <contact-subscription-status> = "other_error", meaning that the subscription is not active and the Contact Subscription Function determines that the non-availability is not transient, so the Contact Subscription Function does not retry.

NOTE: In case the Contact Subscription Function receives a SIP NOTIFY request with the "Subscription-State" header value of "terminated" and determines that the non-availability is transient (e.g., when the reason code is "deactivated" or "probation"), the Contact Subscription Function tries re-subscription, and the Contact Subscription function decides whether the <contact-subscription-status> need to be updated.

## 5.3 Contact Share Function

The Contact Share Function is responsible for handling CAB User's Contact Share requests, initiating an XDCP Request for forwarding Contact Share data, and invoking corresponding messaging actions towards either CAB User or non-CAB User.

### 5.3.1 Procedures at the Originating Side

The Contact Share Function SHALL support retrieval of Contact Share requests stored in the CAB Feature Handler Application Usage [CAB XDMS]. This is accomplished either by polling the document using document management operations or subscribing to changes to the CAB Feature Handler Document. The retrieval is performed via the XDM Agent (see sub clause 5.5 "*XDM Agent*").

Contact Share Function SHALL obtain the data for the Contact Share request via XDM Agent (see sub clause 5.5 "*XDM Agent*") from the CAB Feature Handler Application Usage with the following clarification:

- SHALL set the AUID to "org.openmobilealliance.cab-feature-handler"

Upon obtaining the CAB Feature Handler Document, the Contact Share Function SHALL extract the data from the <contact-share> element.

The Contact Share Function SHALL use the <recipients-list> element to determine the recipients and it identifies the recipients type (i.e. whether the recipient is a CAB or a non-CAB User) . For recipients that are in the CAB User's AB, the recipient type may be determined based on <contact-type> element of <contact-status> of the AB App Usage;

If the recipient is a CAB User:

a. it SHALL construct the XDCP Request using the data retrieved from the CAB Feature Handler Document [CAB XDMS] with the following clarifications:
    i. SHALL set the request URI of the XDCP Request as "http://[XCAP Root URI]/ org.openmobilealliance.cab-address-book /users/[XUI]" if the <data> element in the retrieved Contact Share request contains <AB> child element(s);
    ii. SHALL set the request URI of the XDCP Request as "http://[XCAP Root URI]/ org.openmobilealliance.cab-pcc /users/[XUI]" if the <data> element in the retrieved Contact Share request contains <PCC> child element(s);
    iii. SHALL create the XDCP Document to be included in the XDCP Request by copying the values from the retrieved elements of the <contact-share> ;
    iv. SHALL bind the value of the "id" attribute of the <cab-feature> element that contains the <contact-share> element, with the <request-id> element of the XDCP Request; and
    v. SHALL include <delivery-report> element in the XDCP Request with the value "true" if <delivery-report-request> element in the <contact-share> is set to "true".
b. SHALL send the XDCP request towards the recipient's CAB XDMS via the XDM Agent.

If the recipient is a non-CAB User:

a. It SHALL retrieve appropriate data from CAB User's PCC and/or AB Application Usage based on the data type indicated in the request.
b. It SHALL check the <format> element (if present) from the retrieved Contact Share request data, to determine the format to be used for encoding and delivery of the Contact Share data. If <format> element is not present, the default format value from the <contact-share-format> element in CAB User Preferences XML [CAB XDMS] document is used.
c. When applicable and subject to service provider policies, it SHALL request the CAB Interworking Function to convert the data to be shared to a Legacy Format (i.e. based on the previous step) via the Interworking Function (see sub clause 5.4 "*Interworking Function*").

d. When CPM Interworking Function is used as messaging delivery mechanism, it SHALL construct a message as described in [OMA CPM CONV FCT TS] and send a message towards the CPM Interworking Selection Function [OMA CPM IWF TS].

The Contact Share Function SHALL update the <response> element in the CAB Feature Handler Document based on the response received for the XDCP Request. If <delivery-report-request> element for this <contact-share> request was set to "true", it SHALL further update the <delivery-report-status> in the CAB Feature Handler Document based on the updates made by the CAB XDMS to the Forwarding Notification List Document [OMA XDM List].

For each of the recipients, it SHALL create a <entry-report> element per recipient and set the "uri" attribute of the recipient accordingly. The Contact Share Function SHALL obtain the Forwarding Notification List Document [OMA XDM List] through either by polling the document using document management operations or by subscribe/notify mechanisms of [OMA XDM Core] and populate the <delivery-status> element as follows:

- The <code> element contains the value of either "Pending", "Successful" or "Failure" based on the data retrieved from Forwarding Notification List Document [OMA XDM List] for the Forward XDCP Request.
  - The "Pending" value is set when there is no delivery Report available yet for the Forward XDCP Request.
  - The "Successful" value is set when the <status> element of the Forward Delivery Report XDCP Request is either "delivered" or "rejected".
  - The "Failure" value is set when the <status> element of the Forward Delivery Report XDCP Request is "expired".
- It MAY populate the <phrase> element with descriptive text corresponding to the delivery status.

### 5.3.2 Procedures at the Receiving Side

In case of Sharing PCC, at the receiving side, upon getting notified of the temporary document (i.e. ContactSharePCC.xml ) from PCC Application Usage, the Contact Share Function SHALL update AB Document of the recipient after performing the needed conversion with the following clarifications:

- if the preference set by the CAB User in the XDM Preferences Document based on the section 5.8.7.2 "*Forward-prefs Element*" of [OMA XDM Core] is "accept", it SHALL store the contact shared data into the appropriate <person-details>, <group-details> and/or <org-details> elements under the <contact> element and set the <updated> element of the <entry-status> of the <contact-status> to the value "contact share".
- if the preference set by the CAB User in the XDM Preferences Document based on the section 5.8.7.2 "*Forward-prefs Element*" of [OMA XDM Core] is "confirm", it SHALL store the contact shared data into the appropriate <person-details>, <group-details> and/or <org-details> elements under the <contact> and set <temporary> child element of the <entry-status> of the <contact-status> to the value "contact share".

## 5.4 Interworking Function

The Interworking Function SHALL support the following procedures, described in the sub clauses below:

- Import from non-CAB AB system(s)
- Contact search with External Directories
- Format adaptation (between CAB Format and Legacy Formats)

### 5.4.1 Import from Non-CAB AB Systems

The data for the scheduled import requests of contact(s) from non-CAB AB systems into CAB SHALL be retrieved from the CAB Feature Handler Application Usage [CAB XDMS]. This is accomplished either by document management operations or subscribing to changes to the CAB Feature Handler Document. The retrieval is performed via the XDM Agent (see sub clause 5.5 "*XDM Agent*").

The Interworking Function SHALL obtain the data for the import request via XDM Agent (see sub clause 5.5 "*XDM Agent*") from the CAB Feature Handler Application Usage as follows .

- SHALL set the AUID to "org.openmobilealliance.cab-feature-handler"
- SHALL use the <non-CAB-source> element to identify the source of the non-CAB system from which to import
- SHALL use the <scheduled-interval> element to determine the interval between successive accesses to the non-CAB address book system (i.e. in order to determine the level of synchronization between the non-CAB system and the CAB User's AB)
- MAY use the <credentials> element and the values of the child elements <username> and <password> to obtain access to the non-CAB system(s)

While processing the import request, the Interworking Function MAY set the value of the <code> under <response> element of the corresponding <import-non-cab> element of the CAB Feature Handler Document to "Pending".

If the Interworking Function failed to process the request, the Interworking Function SHALL set the value of the <code> under <response> element of the corresponding <import-non-cab> element of the CAB Feature Handler Document to "Failure".

After successful imported and format adaptation of the each imported contact, the Interworking Function:

1) SHALL use <import-update> element from CAB User Preferences Document [CAB XDMS] to identify how to store the imported contacts, as follows:
   a) When <import-update> element is "true", the Interworking Function SHALL update AB Document in [CAB XDMS] with the resulting changes and SHALL set the value of <updated> element as "contact imported".
   b) When <import-update> element is "false", Interworking Function SHALL store the imported contact to a new <contact> element in AB Document [CAB XDMS], and SHALL set the value of <temporary> element as "contact imported".
2) SHALL set the value of <contact-source> element in AB Document [CAB XDMS]to the value of <non-CAB-source> element in CAB Feature Handler Document [CAB XDMS].
3) SHALL set the value of the <code> element under <response> element of the corresponding <import-non-cab> element of the CAB Feature Handler Document [CAB XDMS] to "Success".

The CAB Server performs the AB synchronization as specified in sub clause 5.1 "*AB Synchronization Function*" in order to inform the CAB Client of the AB updates.

### 5.4.2 Contact Search with External Directories

The CAB Interworking Function SHALL support searches to External Directories, by hosting a standard XML format (see sub clause 5.4.2.1 "*Application Usage for External Directories Search*") and receiving search requests via XDM-7i interface (i.e. Limited XQuery over HTTP).

The contact search requests and responses SHALL be based the Search Document schema as described in [OMA XDM Core] sub clause 5.4.1 "Search Document".

Upon receiving the search request, the CAB Interworking Function SHALL use <dataSource> child element (see sub clause 5.4.2.1.5 "*Extension for <dataSource>*) to construct an external search request.

CAB Interworking Function translates the search requests received via XDM-7i to external search requests based on the format supported by the External Directories, in the case when External Directories do not support the standard XML format. When the External Directories support the standard XML format for search requests, translation MAY not be required.

Note: The interactions with External Directories and mapping the requests/responses to/from External Directories are out of scope of this specification.

The CAB Interworking Function SHALL route back the search requests responses from the External Directory to the Search Proxy via XDM-7i interface. If multiple External Directories are searched, the CAB Interworking Function SHALL aggregate the results prior to sending the response back to the Search Proxy.

#### 5.4.2.1 Application Usage for External Directories Search

This Applications Usage specifies the standard XML format for supporting searches towards External Directories.

If the External Directories content is stored at the CAB Server, the content SHALL conform to the standard XML format (see sub clause 5.4.2.1.4"*XML Schema*") and stored in the Global Tree of the Application Usage as described in [OMA XDM Core] sub clause 5.5 "Global Documents".

##### 5.4.2.1.1 Application Unique ID

The AUID SHALL be "org.openmobilealliance.cab-external-search".

##### 5.4.2.1.2 Default Namespace

The CAB Interworking Function document default element namespace is "urn:oma:xml:cab:external-search".

##### 5.4.2.1.3 Search Capabilities

This Application Usage SHALL support search requests towards External Directories based on standard XML search document that conforms to the XML schema defined in sub clause 5.4.2.1.4 "*XML Schema*" and the following rules apply in addition to the procedures defined in sub clause 5.4.1 "*Search Document*" of [OMA XDM Core]:

1. support a collection "org.openmobilealliance.cab-external-search/global/",
2. The basic XQuery expression supported by this Application Usage SHALL be as follows:

```
xquery version "1.0";
declare default element namespace "urn:oma:xml:cab-external-search";
```

All search requests that do not comply with the basic XQuery expression as defined in this sub clause SHALL be responded with an HTTP "409 Conflict" error response as defined by [OMA XDM Core] in sub clause 6.2.3 "*Searching for Data in XML Documents*".

##### 5.4.2.1.4 XML Schema

The standard XML format for external search SHALL conform to the PCC XML schema as described in [XSD cab pcc].

##### 5.4.2.1.5 Extension for <dataSource>

Additional CAB extension to the search document as described in [OMA XDM Core] sub clause 5.4.1 "*Search Document*":

- The <dataSource> child element of the <search> element indicates the specific external directory source to which the <request> is targeted or the specific external directory source from which the <response> is received. The value SHALL be of type String.

This extension is described in [XSD extSearch]

### 5.4.3 Format Adaptation

The format adaptation between CAB Format and Legacy Format(s) SHALL be supported by the Interworking Function.

The following table defines the supported properties and corresponding semantics between the CAB Format and the Legacy Format (s) vCard object, [vCard 2.1], [RFC2425], [RFC2426].

As all vCard 2.1 or vCard 3.0 properties support a LANGUAGE parameter, it is assumed that this LANGUAGE parameter corresponds implicitly to the "xml:lang" [W3C-XML] attribute which is allowed for all Contacts and PCCs properties (both "xml:lang" and LANGUAGE refer to [RFC5646]).

A few of these properties are defined as informative vCard extensions in Appendix D.

| **Contacts or PCC**<br>**Property or attribute** | **vCard 2.1**<br>**Property/parameter** | **vCard 3.0**<br>**Property/parameter** |
|---|---|---|
| **For PCCs only <pcc>** | | |
| **"pcc-type" attribute** | ▨ | ▨ |
| **For Contacts only <contact>** | | |
| <contact-status><br>Cardinality: (0,1) | ▨ | ▨ |
| <contact-type><br>Cardinality: (0,1) | ▨ | ▨ |
| <type><br>Cardinality: (1,1) | ▨ | ▨ |
| <contact-type-source><br>Cardinality: (0,1) | ▨ | ▨ |
| <entry-status><br>Cardinality: (0,1) | ▨ | ▨ |
| <updated><br>Cardinality: (0,n) | ▨ | ▨ |
| <temporary> with "contactIdRef" attribute<br>Cardinality: (0,1) | ▨ | ▨ |
| "contactIdRef" attribute | ▨ | ▨ |
| <contact-subscription-status><br>Cardinality: (0,1) | ▨ | ▨ |
| <contact-source><br>Cardinality: (0,1) | ▨ | ▨ |
| **For PCCs and Contacts <pcc> and <contacts>** | | |
| <person-details> with "index" attribute<br>PCC: Cardinality: (0,n)<br>Contact: Cardinality: (0,1) | See conditions & details below<br>The mapping corresponds to one <person-details>. | |
| "index" attribute | ▨ | ▨ |
| <name> with "pref" , "name-type" , “index” attributes<br>Cardinality: (1,n) | <N> without the Pref attribute value and without name-type attribute value 🡐 only the one with minimum pref value | <N> (or <Nickname> when name-type='KnownAs') , without the Pref attribute value and without name-type attribute value 🡐 only the one with minimum pref value (without name-type) |
| "pref" attribute | ▨ | ▨ |
| "name-type" attribute | ▨ | ▨ |
| "index" attribute | ▨ | ▨ |
| <title> with ‘display-order’ attribute<br>Cardinality: (0,n) | <N>; Name Prefix (fourth field) | <N>; Honorific Prefix (fourth field) |
| "display-order" attribute | ▨ | ▨ |
| “phonetic”<br>Cardinality: (0,1) | ▨ | ▨ |
| <given> with ‘display-order’ attribute<br>Cardinality: (0,n) | <N>; Given Name (second field) | |
| "display-order" attribute | ▨ | ▨ |
| “phonetic”<br>Cardinality: (0,1) | ▨ | ▨ |

| | | |
|---|---|---|
| <middle> with 'display-order' attribute<br>Cardinality: (0,n) | <N>; Additional Names (third field) | |
| "display-order" attribute | ▨ | |
| "phonetic"<br>Cardinality: (0,1) | ▨ | |
| <family> with 'display-order' attribute<br>Cardinality: (0,n) | <N>; Family Name (first field) | |
| "display-order" attribute | ▨ | |
| "phonetic"<br>Cardinality: (0,1) | ▨ | |
| <gen-id> with "display-order" attribute<br>Cardinality: (0,n) | <N>; Name Suffix (fifth field) | <N>; Honorific Suffix (fifth field) |
| "display-order" attribute | ▨ | |
| "phonetic"<br>Cardinality: (0,1) | ▨ | |
| <degree> with "display-order" attribute<br>Cardinality: (0,n) | <N>; Name Suffix (fifth field) | <N>; Honorific Suffix (fifth field) |
| "display-order" attribute | ▨ | |
| "phonetic"<br>Cardinality: (0,1) | ▨ | |
| <display-name><br>Cardinality: (1,1) | <FN> | |
| <address> with "index", "pref", "addr-type" attributes<br>Cardinality: (0,n) | <ADR> with TYPE=addr-type value without the Index. Pref attributes values<br>Or<br><LABEL> with TYPE=addr-type value without the Index. Pref attributes values<br>🡐 only the first value of <address> or the one with minimum pref value<br>see conditions & details below | |
| "index" attribute | ▨ | |
| "pref" attribute | ▨ | |
| "addr-type" attribute | TYPE parameter | |
| <location><br>Cardinality: (0,1) | ▨ | |
| <label><br>Cardinality: (0,1) | ▨ | |
| <addr-string><br>\Cardinality: (0,1) | ▨ | |
| <country><br>Cardinality: (0,1) | <ADR>; Country (seventh field) | |
| <region> with "region-type" attribute<br>Cardinality: (0,1) | <ADR>; region (fifth field) 🡐 only the region-name i.e. without the region-type | |
| "region-type" attribute | ▨ | |
| <region-name><br>Cardinality: (1,1) | <ADR>; region (fifth field) | |
| <sub-region> with "region-type" attribute | ▨ | |

| | |
|---|---|
| "region-type" attribute | ▨ |
| <locality> with "locality-type" attribute<br>Cardinality: (0,1) | See conditions & details below |
| "location-type" attribute | ▨ |
| <locality-element><br>Cardinality: (1,1) | <ADR>; locality-element (fourth field) |
| <sub-locality> with "sublocality-type" attribute | ▨ |
| "subloc-type" attribute | ▨ |
| <street><br>Cardinality: (0,1) | <ADR>; Street (third field)<br>"str-name and str-number" are just put one after the other (i.e. without separating comma)<br>Example :<br>ADR;TYPE=home: ;str-name str-number ;…… |
| < str-name><br>Cardinality: (1,1) | <ADR>; Street (third field) |
| <str-number><br>Cardinality: (1,1) | <ADR>; Street (third field) |
| <intersection> | ▨ |
| <int-name><br>Cardinality: (1,1) | ▨ |
| <int-number> | ▨ |
| <post_code><br>Cardinality: (0,1) | See conditions & details below |
| <post-code-main><br>Cardinality: (1,1) | <ADR>; post-code-main (sixth field) |
| <sub-post-code><br>Cardinality: (1,1) | ▨ |
| <postal-delivery-point><br>Cardinality: (0,1) | <ADR>; Post Office Box (first field) only the first postal-delivery-point-name without index and pref attributes |
| <postal-delivery-point-name> with "index", "pref" attributes<br>Cardinality: (1,n) | <ADR>; Post Office Box (first field) only the first postal-delivery-point-name without index and pref attributes |
| "index" attribute | ▨ |
| "pref" attribute | ▨ |
| <post-office><br>Cardinality: (0,1) | ▨ |
| <postal- office-name> with "index", "pref" attribute<br>Cardinality : (1,n) | ▨ |
| "index" attribute | ▨ |
| "pref" attribute | ▨ |
| <rural-delivery-point> with "index", "pref" attributesCardinality : (0,1) | ▨ |
| "index" attribute | ▨ |
| "pref" attribute | ▨ |
| <extended-address> with "index" attribute<br>Cardinality : (1,n) | <ADR>; Extended address (second field) 🡐 only the first value of <extended-address> without index attribute |
| "index" attribute | ▨ |
| <premises> with "premise-type" attribute | <ADR>; Extended address (second field) 🡐 only the first value of <extended-address> without index attribute |
| "premises-type" attribute | |
| <premises-name> | |

| | |
|---|---|
| <premises-number> | |
| <sub-premises> with "sub-premises-type" attribute | |
| "sub-premises-type" attribute | |
| <sub-premises-name> Card : (0,n) | |
| <sub-premises-number> Card : (0,n) | |
| <location> Cardinality: (0,1) | <GEO> and <TZ> see conditions & details below |
| < label> | ▨ |
| <latitude> | <GEO>; lat (first field) in decimal form with "decimal value=+/- degrees + minutes/60 + seconds/3600" Decimal value is positive when lat-sign='N', negative when lat-sign='S' |
| <degrees-measure> | |
| <minutes-measure> | |
| <seconds-measure> | |
| <lat-sign> | |
| <longitude> | <GEO>; lon (second field) in decimal form with "decimal value=+/- degrees + minutes/60 + seconds/3600" Decimal value is positive when long-sign='E', negative when long-sign='W' |
| <degrees-measure> | |
| <minutes-measure> | |
| <seconds-measure> | |
| <long-sign> | |
| <altitude> | ▨ |
| <time-zone> | See conditions & details below |
| <tz-label> | ▨ |
| <utc-offset> | <TZ> |
| <tz-url> | ▨ |
| <comm.-addr> Cardinality: (1,1) | <TEL> and <EMAIL> with parameter PREF See conditions & details below |
| < uri-entry> with "index", "pref", "addr-uri-type", attributes Cardinality: (0,n) | See conditions & details below |
| "index" attribute | ▨ |
| "pref" attribute | a) When addr-uri-type = 'email' <EMAIL>;PREF;TYPE=addr-uri-type values:uri PREF is only used for the uri with the minimum "pref" value b) When addr-uri-type="SIP URI" or "IM" or "pres URI" <IMPP>;PREF:uri PREF is only used for the uri with the minimum "pref" value |
| "addr-uri-type" attribute | |
| <addr-uri> Cardinality: (1,1) | |
| < label> (i.e communication mean) | ▨ |
| <tel> with "index", "pref", "tel-type" Cardinality: (0,n) | See conditions & details below |
| "index" attribute | ▨ |
| "pref" attribute | <TEL>;PREF;TYPE=tel-type: tel-nb and extension translated to an X500 value PREF is only used for the tel with the minimum "pref" value |
| "tel-type" attribute | |
| <tel-nb> which is <tel-str> or <tel-uri> or <E.164> Cardinality: (1,1) | |
| <extension> | |
| <label> | ▨ |

| | |
|---|---|
| <birth> Cardinality: (0,1) | <BDAY> see conditions & details below |
| < date> Cardinality: (0, 1) | <BDAY> |
| <non-greg-date> with "cal-type" attribute Cardinality: (0,n) | ▨ |
| "cal-type" attribute | ▨ |
| "index" attribute | ▨ |
| <place>> with "index" attribute Cardinality: (1,n) | ▨ |
| "index" attribute | ▨ |
| <anniversary-list> Cardinality: (0,1) | ▨ |
| <anniversary-entry> Cardinality: (1,n) | ▨ |
| "index" attribute | ▨ |
| <anniversary-date> Cardinality: (0,1) | ▨ |
| <date> Cardinality: (0,1) | ▨ |
| <non-greg-date> with "cal-type" and index attributes Cardinality: (0,n) | ▨ |
| "cal-type" attribute | ▨ |
| "index" attribute | ▨ |
| < label> | ▨ |
| <gender> Cardinality: (0,1) | ▨ |
| <language-list> Cardinality: (0,1) | ▨ |
| <language-entry> with "language-proficiency-type", "language-fluency-type", "index"attributes Cardinality: (1,n) | ▨ |
| "language-proficiency-type" attribute | ▨ |
| "language-fluency-type" attribute | ▨ |
| "index" attribute | ▨ |
| "pref" attribute | ▨ |
| <media-list> Cardinality: (0,1) | <SOUND> and <LOGO> and <PHOTO> see conditions & details below |
| <media-entry> with "media-content", "media-type" , “index”, “pref” attributes | See conditions and details below |

| | | |
|---|---|---|
| Cardinality: (1,n) | ▨ When media-content is "video" | |
| "media-content" attribute | ▨ | |
| "media-type" attribute | ▨ | |
| "index" attribute | ▨ | |
| "pref" attribute | ▨ | |
| "media" | When media-content is "sound" or "logo" or "photo"<br><SOUND> or <LOGO> or <PHOTO> with TYPE="a translation of media-type attribute i.e TYPE=the media type value when media-content = photo or logo (see RFC4288)" | |
| <media-label> | ▨ | |
| <category-list><br>Cardinality: (0,1) | ▨ | <CATEGORIES> |
| <category-entry> with "index" attribute<br>Cardinality: (1,n) | ▨ | <CATEGORIES> |
| "index" attribute | ▨ | |
| <web resources><br>Cardinality: (0,1) | <URL><br>see conditions & details below | |
| <web-entry> with "index" attribute | | |
| "index" attribute | ▨ | |
| <url><br>Cardinality: (1,1) | <URL> 🡐 only the first value of <url> without the pref attribute value | |
| < label> | ▨ | |
| | | |
| <key-list><br>Cardinality: (0,1) | <KEY> with TYPE= key-type value | |
| <key-entry> with "display-order", "key-type" attributes | ▨ | |
| "display-order" attribute | ▨ | |
| "key-type" attribute | <KEY> with TYPE= key-type value | |
| <key><br>Cardinality: (1,1) | | |
| <label> | ▨ | |
| <service-list><br>Cardinality: (0,1) | ▨ | |
| <service-entry> with "index" attribute<br>Cardinality: (1,n) | ▨ | |
| "index" attribute | ▨ | |
| < label> | ▨ | |
| <alias> | ▨ | |
| < url> | ▨ | |
| <expertise-list><br>Cardinality: (0,1) | ▨ | |
| <expertise-entry> with "e-level", "index" attributes<br>Cardinality: (1,n) | ▨ | |
| "e-level" attribute | ▨ | |

| | |
|---|---|
| "index" attribute | ▨ |
| <hobby-list> Cardinality: (0,1) | ▨ |
| <hobby-entry > with "h-level", “index” attributes Cardinality: (1,n) | ▨ |
| "h-level' attribute | ▨ |
| "index" attribute | ▨ |
| <interest-list> Cardinality: (0,1) | ▨ |
| <interest-entry > with "i-level", “index” attributes Cardinality: (1,n) | ▨ |
| "i-level" attribute | ▨ |
| "index" attribute | ▨ |
| <career-history> Cardinality: (0,1) | ▨ |
| <history-entry> with "index" attribute Cardinality: (1,n) | ▨ |
| "index" attribute | ▨ |
| <history-description> with "history-type" attribute Cardinality: (1,1) | ▨ |
| "history-type" attribute | ▨ |
| <start-date> with "cal-type" | ▨ |
| "cal-type" attribute | ▨ |
| "end-date" with “cal-type” attribute | ▨ |
| "cal-type" attribute | ▨ |
| <note> Cardinality: (0,1) | <NOTE> |
| <organization-list> Cardinality: (0,1) | ▨ |
| <organization-entry> with "index", “pref” attributes Cardinality: (1,n) | ▨ |
| "index" attribute | ▨ |
| <display-name> Cardinality: (1,1) | ▨ |
| <entity> Cardinality: (0,1) | ▨ |
| <unit> Cardinality: (0,1) | ▨ |
| <position> Cardinality: (0,1) | ▨ |
| <role> Cardinality: (0,1) | ▨ |
| <url> Cardinality: (0,1) | ▨ |

| | |
|---|---|
| <group-list><br>Cardinality: (0,1) | ▨ |
| <group-entry> with "index", “pref” attributes<br>Cardinality: (1,n) | ▨ |
| "index" attribute | ▨ |
| <display-name><br>Cardinality: (1,1) | ▨ |
| <entity><br>Cardinality: (0,1) | ▨ |
| <url><br>Cardinality: (0,1) | ▨ |
| Any other elements | ▨ |
| <service-provider-specific-list><br>Cardinality: (0,1) | ▨ |
| <sp-specific-entry> with "index" attribute<br>Cardinality: (1,n) | ▨ |
| "index" attribute | ▨ |
| <sp-specific-label><br>Cardinality: (1,1) | ▨ |
| <sp-data><br>Cardinality: (1,1) | ▨ |

| | |
|---|---|
| <org-details> with "index" attribute<br>PCC: Cardinality: (0,n)<br>Contact: Cardinality: (0,1) | See conditions & details below<br>The mapping corresponds to one <org-details> |
| "index" attribute | ▨ |
| <org-name> with "pref", "org-name-type", “index”attributes<br>Cardinality: (1,n) | <ORG><br>see conditions & details below |
| "pref" attribute | ▨ |
| "org-name-type" attribute | ▨ |
| "index" attribute | ▨ |
| <display-name><br>Cardinality: (0,1) | <ORG> 🡐 only the display-name and unit values included in the first occurrence of <org-name> without the pref, “index” and org-name-type attributes values |
| <unit><br>Cardinality: (0,1) | |
| <entity><br>Cardinality: (0,1) | ▨ |
| <org-members-list><br>Cardinality: (0,1) | ▨ |
| <org-member> with "index" attribute<br>Cardinality: (1,n) | ▨ |
| “index” attribute | ▨ |
| <member-details-url><br>Cardinality: (1,1) | ▨ |
| <position><br>Cardinality: (0,1) | ▨ |
| <role> | ▨ |

| | |
|---|---|
| Cardinality: (0,1) | ▨ |
| <org-directory> Cardinality: (0,1) | ▨ |
| <comm-addr> Cardinality: (0,1) | ▨ |
| <media-list> Cardinality: (0,1) | ▨ |
| <web-resources> Cardinality: (0,1) | ▨ |
| <key-list> Cardinality: (0,1) | ▨ |
| Any other elements | ▨ |

| | |
|---|---|
| <group-details> with "index" attribute PCC: Cardinality: (0,n) Contact : Cardinality : (0,1) | ▨ |
| "index" attribute | ▨ |
| <group-name> with “index”, “pref” attributes Cardinality: (1,n) | ▨ |
| <group-members-list> Cardinality: (0,1) | ▨ |
| <group-member> with "index" attribute Cardinality: (1,n) | ▨ |
| “index” attribute | ▨ |
| <member-details-url> Cardinality: (1,1) | ▨ |
| <group-uri> Cardinality: (0,1) | ▨ |
| <comm-addr> Cardinality: (0,1) | ▨ |
| <media-list> Cardinality: (0,1) | ▨ |
| <web-resources> Cardinality: (0,1) | ▨ |
| <key-list> Cardinality: (0,1) | ▨ |
| Any other elements | ▨ |

| | |
|---|---|
| Any other elements | ▨ |

**Table 1: Mapping between CAB Format and Legacy Format(s)**

## 5.5 XDM Agent

The XDM Agent acts as a supporting entity to other CAB Server functions and supports interactions (i.e. document management operations, subscriptions/notifications, history access, forwarding, document share by reference) with CAB

Application Usages [CAB XDMS]. The document management operation supported for PCC Application Usageis limited to read-only.

If CAB Server populates the CAB capability (i.e. CAB / non-CAB) through Presence Enabler [OMA Pres] and the CAB Server publishes the CAB capability as Permanent Presence State, then the XDM Agent SHALL interact with the Presence XDMS for this purpose as described in [OMA Pres TS] Section 5.1.3 "*Manipulation of Permanent Presence State using XCAP*".

The XDM Agent SHALL support the following procedures as described in [OMA XDM Core] sub clause 6.1 "*Procedures at the XDMC and the XDM Agent*":

- Procedures of document management of CAB XML documents [CAB XDMS] based on sub clause 6.1.1 "*Document Management*" from [OMA XDM Core].
  In case the AB Synchronization Function requests XDM Agent to access AB Application Usage, the XDM Agent SHALL use the identity (XUI) of the CAB User. In all the other cases when the CAB Server performs write operations into the AB Application Usage (e.g. triggered by Contact Subscription), the XDM Agent SHALL use XUI assigned to the CAB Server, (i.e. different from XUIs of CAB Users).
- Procedures of subscription to changes in CAB XML documents [CAB XDMS] as described in sub clause "6.1.2 "*Subscribing to changes in the XML documents*" with the exception of sub clause 6.1.2.1.2 "*XDMC*" in [OMA XDM Core].
- Procedure of Document Reference information management for CAB AB Document as described in sub clause 6.1.1.3.1 "Document Reference Operations" (only XDM Agent part) from [OMA_XDM_core].
- Procedures of susbcription to changes in UPP Directory Document stored in UPP Directory XDMS[OMA-XDM-UPP] as described in sub clause 6.1.2 "Subscribing to changes in the XML documents" with the exception of sub clause 6.1.2.1.2 "XDMC" [OMA XDM Core].
- Procedures of history information access for CAB XML documents [CAB XDMS] based on sub clause 6.1.4.2 "*Request History Information*" in [OMA XDM Core]
- Procedures of XDM Forwarding for CAB XML documents [CAB XDMS] based upon sub clause 6.1.1.3.2 "*XDM Resource Forwarding Operations*" in [OMA XDM Core]

The XDM Agent SHALL support the Application Usages specified in [CAB XDMS].

## 5.6 Presence Source

If CAB Server populates the CAB capability (i.e. CAB / non-CAB) through Presence Enabler [OMA Pres] and the CAB Server publishes the CAB capability as a SIP Publish, then the Presence Source SHALL interact with the Presence Server for this purpose as described in [OMA Pres TS] Section 5.1.2 "*Publication of Presence Information using SIP*".

## 5.7 Presence Watcher

If CAB Server populates the CAB capability (i.e. CAB / non-CAB) through Presence Enabler [OMA Pres], then the Presence Watcher SHALL subscribe to the Presence information of the contacts of the CAB Users served by this CAB Server as described in [OMA Pres TS] Section 5.2 "*Watcher*", in order to receive the CAB capability of those contacts as part of the Presence information updates.

## 5.8 Contact Status Function

The Contact Status Function SHALL manage the Contact Status information contained in the <contact-status> element of the Contact Entry following the rules and procedures as specified in AB Application Usage [CAB XDMS].

### 5.8.1 Management of Contact Status in AB

When there is a change to the contacts in the AB (e.g. to an existing or new Contact Entry), the CAB Server records the status of the change to the <contact-status> element of the corresponding Contact Entry. The CAB Server SHALL use the <contact-status> element and its child elements to convey the status information to the CAB User.

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

The Contact Status in the AB SHALL be populated for the following operations that occur in the CAB Server:

- Contact Subscription – See sub clause 5.2 "*Contact Subscription Function*" for procedures to populate the Contact Status information associated with the outgoing Contact Subscriptions.
- Import non-CAB – See sub clause 5.4.1 *"Import from Non-CAB AB Systems"* for procedures to populate the Contact Status information associated with the Import non-CAB requests.
- Incoming Contact Subscription Request - See sub clause 5.8.3 "*Incoming Contact Subscription Requests*" for procedures to populate the Contact Status information associated with the incoming Contact Subscription Requests.
- Contact Share – See sub clause 5.3 "*Contact Share Function*" for procedures to populate the Contact Status information associated with incoming Contact Share information.

### 5.8.2 Population of CAB Capability based on the Presence Enabler

If CAB Server populates the CAB capability (i.e. CAB / non-CAB) through Presence Enabler [OMA Pres] then the following procedures SHALL be followed.

The CAB tuple in the presence document is defined according to [OMA PDE], using the <service-description> registered by OMNA:

```
<tuple >        →<status>→<basic>→open/closed
                →<willingness>→<basic>→open/closed
                →<service-description>→<service-id>→org.openmobilealliance:CAB
                                      →<version>→1.0
                →<contact>→ tel:+1-123-456-7890
```

When a user becomes a CAB user then the <status><basic> and <willingness><basic> elements in the CAB tuple SHALL be set to "open" and the <contact> element to the CAB XUI. This can be done either as a SIP Publish by the Presence Source or by modification of the Permanent Presence State by the XDM Agent.

When a user unsubscribes from CAB then the <status><basic> and <willingness><basic> elements in the CAB tuple SHALL be set to "closed". This can be done either as a SIP Publish by the Presence Source or by modification of the Permanent Presence State by the XDM Agent.

The Presence Watcher SHALL subscribe to the Presence information of the CAB Users' contacts served by the CAB Server by either of the following procedures:

- Individual Presence subscriptions to each of the contacts in the address book of each of the CAB Users, on behalf of these users. Multiple subscriptions to a specific contact may be performed if that contact is included in the address books of more than one CAB User.
- Single anonymous Presence subscription for each contact included in at least one address book of the CAB Users served by that CAB server.

When the Presence Watcher receives a presence notification then it will check the changes in the CAB tuple and update the <contact-type> element in the AB Application Usage as detailed below. Notifications associated to an anonymous subscription will result in updates to the AB Application Usage of all CAB Users with that contact in their address books.

Notifications associated to an individual Presence subscription will result in updates to the AB Application Usage of the specific CAB User on which behalf that subscription was issued.

Upon reception of a Presence notification with the <status><basic> element in a contact's CAB tuple with value "open" and in case that contact's <contact-type> in the AB Application Usage was not present (meaning a non-CAB user) then it SHALL be included, the sub-element < type> SHALL be set to "CAB", the sub-element <contact-type-source> SHALL be set to "presence" (reflecting that this information has been obtained through the Presence Enabler) and the address received in the <contact> element in the CAB tuple SHALL be marked as the CAB XUI in the AB Application Usage by setting the corresponding "xui-type" attribute to "CAB".

Upon reception of a Presence notification with no CAB tuple for a contact or with the <status><basic> element in a contact's CAB tuple with value "closed" and provided that contact's < type> was set to "CAB" and the <contact-type-source> was set to "presence" (meaning that this information was obtained through the Presence Enabler), then the <contact-type> element SHALL be removed altogether (meaning that the user is no longer a CAB user). In case that the <contact-type-source> is not set to "Presence" then no action is performed as the contact type information may have been obtained from other sources and the absence of the CAB tuple may mean that the Presence Server has no information about the CAB capability of its users.

### 5.8.3 Incoming Contact Subscription Requests

The incoming Contact Subscription requests for reactive authorization are notified to the CAB User using the Contact Status information in CAB User's AB.

The Contact Status Function SHALL detect and notify the incoming Contact Subscription request(s) that require re-active authorization from the CAB User using the following procedures:

Note: The first two procedures are pre-conditions for the Contact Status Function to be able to detect the incoming Contact Subscription Request.

- SHALL subscribe to changes of the Request History Information Document in the PCC Application Usage via XDM Agent based on the procedures described in section 6.1.2 "*Subscribing to Changes in the XDM Resources*" of [OMA XDM Core] in order to detect the incoming Contact Subscription request.
- SHALL set the <history-prefs> element in XDM Preferences Document in PCC Application Usage [CAB XDMS] as described in [OMA XDM Core], sub clause 5.8 "*XDM Preferences Document*" in such a way that the Request History Information Document (as described in [OMA XDM Core], sub clause 5.7.2 "Request History Information Document") is updated with unsuccessful incoming Contact Subscription requests.
- Upon receiving the change notification for the Request History Document of the PCC Application Usage, SHALL use the <notify-when-receive-contact-subscription> element in CAB User Preferences Document to check the notification preferences of the CAB User for incoming Contact Subscription requests.
- If <notify-when-receive-contact-subscription> element is set to "true", the Contact Status Function SHALL retrieve the information associated with unsuccessful incoming Contact Subscription requests via XDM Agent (see sub clause 5.5 "*XDM Agent*"), and:
    - o If the CAB User's AB Document [CAB XDMS] contains a Contact Entry associated with the requestor of the incoming Contact Subscription request, the <updated> element under the <entry-status> of the Contact Entry SHALL be set to the value 'incoming subscription request'.
    - o If the CAB User's AB Document [CAB XDMS] does not contain a Contact Entry associated with the requestor of the incoming Contact Subscription request, a new <contact> element SHALL be created in the AB Document, SHALL set the <temporary> element under the <entry-status> with the value 'incoming subscription request', and corresponding contact information of the requestor is populated under the <contact> element.

### 5.8.4 Contact Added

The CAB Server SHALL detect the addition of a CAB User to another CAB User's AB, once the added contact is marked as CAB User in the <contact-type> element in the AB Document. The interdomain conveyance of CAB User addition to other CAB User's Address Book is achieved though SIP MESSAGE method as described in the following sub clause.

#### 5.8.4.1 Originating Side

If the <send-notification-contact-added> element of the CAB User Preferences Document [CAB XDMS] is set to "true ", the following procedures SHALL apply:

The 'CAB Contact Added' data as described in the table below SHALL be used to share between multiple domains to resolve CAB-HLF-012 [CAB RD]. The 'CAB Contact Added' data is generated at the CAB Server when a CAB User adds another CAB User (who belongs to the remote domain) to his/her AB.

AB owner – is referred to the CAB User who is performing the Add operation

Added contact – is referred to the contact that is added by the CAB User.

| **Element** | **DataType** | **Cardinality** | **Description** |
|---|---|---|---|
| AB owner | | | This represents the AB owner data. It SHALL contain the owner-XUI element |
| Owner-XUI | xs:anyURI | 1 | The XUI of the originating CAB User performing the Add operation |
| **Added contact** | | | This represents the added contact data. It SHALL contain the added-XUI of the contact. |
| Added-XUI | xs:anyURI | 1 | The XUI of the contact added by the CAB User |

**Figure 1: Contact added data details**

The CAB Server SHALL send the fragment representing 'CAB Contact Added' data as described in the above table using the CAB-NNI-1 interface [CAB AD] to the remote CAB domain, based on the XUI of the added contact.

Prior to sending the fragment to the remote domain, the CAB Server SHALL check the CAB User's PCC Access Permissions to verify if the CAB User's XUI publication to the added contact is allowed. The publication is considered allowed if at least <allow-retrieve> access level is granted to the added contact. The CAB Server SHALL proceed as follows:

- If the PCC Access Permissions do not allow publication of the CAB User's XUI to the added contact's XUI, the CAB Server SHALL NOT send the fragment.
- If the PCC Access Permissions allow publication of the CAB User's XUI to the added contact's XUI, the CAB Server SHALL send the fragment using SIP MESSAGE[RFC 3428] method as described below:

The CAB Server SIP MESSAGE request SHALL be constructed and sent according to SIP/IP Core [OMA XDM Core] using the following steps:

1. Set the Request-URI of the SIP MESSAGE with the value of the recipient's XUI (i.e. the value of added-XUI).
2. Set the To header field of the SIP MESSAGE with the Request-URI;
3. Set the From header field of the SIP MESSAGE with the value of the originator's XUI (i.e. the value of owner-XUI) and the 'display-name' parameter of the From header to the Owner's display-name from his/her PCC that has the highest 'pref' value.;
4. Set the P-Asserted-Identity header field of the SIP MESSAGE with the value of the originator's XUI (i.e. the value of owner-XUI);

5. Set the Accept-Contact header field with the value of the CAB feature tag, i.e. "3gpp-service.ims.icsi.oma.cab_1.0";
6. Set the P-Preferred-Service header field wit the value of the CAB feature tag, i.e. ""3gpp-service.ims.icsi.oma.cab_1.0";
7. The SIP MESSAGE SHALL have an empty body.
8. Set the other required SIP headers according to [OMA XDM Core] and send the SIP MESSAGE according to the procedures of the SIP/IP Core that is referenced in [OMA XDM Core];

#### 5.8.4.2 Receiving Side

The CAB Server SHALL receive the 'CAB Contact Added' data from the remote domain using SIP MESSAGE request.

The CAB Server SHALL process the received SIP MESSAGE request according to the procedures of the SIP/IP Core referenced by [OMA XDM Core], as follows:

- Check if the CAB feature tag "3gpp-service.ims.icsi.oma.cab_1.0" is the present in the Accept-Contact header field. If the CAB feature tag is not present or the value is not recognized, the CAB Server SHALL reject the request with SIP 403 "Forbidden" response.
- Retrieve and process the SIP MESSAGE request (i.e. validate the value of "To" and "From" headers to match the semantics of added-XUI and owner-XUI respectively);
- The CAB Server SHALL use the 'display-name' parameter from the "From" header in the notification to the recipient CAB User.
- If the SIP MESSAGE has an empty body, the CAB Server SHALL interpret it as a contact-added notification.
- Respond with 200 OK SIP response code according to [RFC 3428]; or
- Reject with 488 Not Acceptable Here SIP response code if the values of "To" and "From" values do not match the semantics of added-XUI and owner-XUI respectively.

Upon identifying that a CAB User has been added by another CAB User (i.e., by receiving a SIP MESSAGE from the remote domain or determined otherwise withing the same domain) the CAB Server SHALL verify the following:

i. if the recipient CAB User's <receive-notification-when-contact-added> user preference is set to 'true', and
ii. if the recipient CAB User's AB Access Permissions for the originating CAB User XUI allow the notification of the Contact Added data

then the Contact Status Function may notify the CAB User that another CAB User has added him/her to their address book. The notification mechanism for this feature is out of scope of this specification.

## 5.9 Applying CAB User Preferences

The CAB Server SHALL act as XDM Agent as described in sub clause 5.5 "*XDM Agent*" to retrieve the UPP Directory Document [OMA XDM UPP] of each CAB User and identify the Active User Preferences Profile associated with each of CAB User's devices. After identifying the Active User Preferences Profile, the CAB Server SHALL apply the preferences stored in the CAB User Preferences Document [CAB XDMS] related to the Active User Preferences Profile.

# 6. Procedures at CAB Client

## 6.1 Address Book Management and Synchronization

The CAB Client SHALL use OMA Data synchronization protocol [OMA DS Pro] as specified in section 5.3.2.8 "*Interface* CAB-1*: CAB Server*" in [CAB AD] to synchronize the data modifications in the address book with the CAB Server.

The CAB Client SHALL support at least one of AB CAB Format or the Legacy Formats vCard 2.1 [vCard 2.1], vCard 3.0 as defined in [RFC2425] and [RFC2426] respectively for AB synchronization with CAB Server.

Note: Syncing with the Legacy Formats may result in reduced support of the AB contact information provided by the AB Application Usage. (mapping table is specified in sub clause 5.4.3 "*Format Adaptation*").

CAB Client SHALL be able to receive "Server Alerted Sync" as specified in [OMA DS Pro], sub clause 12 "*Server Alerted Sync*", to synchronize with the CAB Server i.e. as a result of updates from AB Application Usage [CAB XDMS].

## 6.2 Personal Contact Card (PCC) Management

The CAB Client SHALL format the requests for CAB User's PCC Document management as described in the [OMA XDM Core] sub clause 6.1.1 "*Document Management*" with the following clarifications:

- It SHALL populate the AUID of the XCAP URI with "org.openmobilealliance.cab-pcc" application usage for the PCC, as defined in [CAB XDMS].

## 6.3 CAB User Preferences Management

The CAB Client SHALL format the requests for CAB User Preferences Document management as described in the [OMA XDM Core] sub clause 6.1.1 "*Document Management*" with the following clarifications:

- It SHALL populate the AUID of the XCAP URI with "org.openmobilealliance.cab-user-prefs" Application Usage for CAB User preferences as defined in [CAB XDMS].

## 6.4 Import Non-CAB Address Book

The CAB Client SHALL use the <import-non-cab> element in the CAB Feature Handler Document [CAB XDMS] to store the non-CAB address import request data, and SHALL use the procedures as described in the [OMA XDM Core] sub clause 6.1.1 "*Document Management*" with the following clarifications:

1) SHALL use the AUID "org.openmobilealliance.cab-feature-handler".

2) SHALL populate <non-CAB-source> , <scheduled-interval> and <credential> elements.

The CAB Client SHALL use the <response> element of the <import-non-cab> element to indicate the status of the request to the CAB User, with the following clarifications:

1) SHALL use either subscription operation or document management operation as specified in section 6.1 "*Procedures at the XDMC and the XDM Agent*" of [OMA XDM Core] to obtain the CAB Feature Handler Document [CAB XDMS].
2) SHALL use <import-non-cab> "id" attribute that is associated with the same request.
3) MAY delete the whole import request of <import-non-cab> element, when AB synchronization is completed.

The CAB Client retrieves the imported Contact Entries (i.e. with either <updated> or <temporary> element value set to "contact imported"), through the AB synchronization performed as specified in sub clause 6.1 "*Address Book Management and Synchronization*".

## 6.5 Contact Share

The CAB Client SHALL use the <contact-share> element in the CAB Feature Handler Document [CAB XDMS], to store the Contact Share request data and SHALL use the procedures as described in the [OMA XDM Core] sub clause 6.1.1 *"Document Management"* with the following clarifications:

- SHALL use the AUID "org.openmobilealliance.cab-feature-handler".
- SHALL populate the <recipients-list> element
- SHALL populate the <data> element with their child elements i.e. <PCC> and/or <AB> elements.
- MAY populate <note>, <display-name>, and <delivery-report-request> elements.
- MAY populate the <format> element.

The CAB Client SHALL use the <response> element of the corresponding <contact-share> element of the CAB Feature Handler Document[CAB XDMS] to indicate the status of the Contact Share request to the CAB User, with the following clarifications:

1) SHALL use either subscription operation or polling mechanism using document management operations following the rules and procedures specified in section 6.1 "*Procedures at the XDMC and the XDM Agent*" of [OMA XDM Core] to obtain the <response> element of the CAB Feature Handler Document [CAB XDMS].
2) SHALL use <contact-share> "id" attribute that is associated with the corresponding Contact Share request.
3) When the <delivery-report-request> is set to "false", or when <delivery-report-status> element indicates the result as 'Successful' or 'Failure' for all recipients, it MAY delete the <contact-share> element of the request, when the <code> element of the <response> element has the value "Success" or "Failure" respectively, subject to service provider policies.

Note: Handling of contact share requests for multiple recipients with multiple <delivery-reports-status> values is out of scope.

The CAB Client SHALL use the <delivery-report-status> element of the <contact-share> element to indicate the status of the delivery report for the corresponding Contact Share request to the CAB User.

## 6.6 Contact Subscription

In order to subscribe or unsubscribe to a contact's PCC Document changes, the CAB Client SHALL follow the procedures as described in the [OMA XDM Core] sub clause 6.1.1 "*Document Management*" to respectively add or delete the corresponding <entry> element in the <subscription-list> element of his/her CAB User Preferences Application Usage [CAB XDMS] with the following clarifications:

- It SHALL populate the AUID of the XCAP URI with "org.openmobilealliance.cab-user-prefs" Application Usage for CAB User Preferences as defined in [CAB XDMS];
- It SHALL populate the 'id' attribute of the <entry> element with the XUI of the contact to subscribe to;
- It MAY populate a <filter-set> sub-element of the <entry> element by following the procedure described in sub clause 6.1.2.1.2 "*XDMC*" of [OMA XDM Core].

## 6.7 Access Permissions management

If the Access Permissions Document is used, the procedure to manage the Access Permissions Document at CAB Client SHALL conform to the sub clause 6.1.1 "*Document Management*" and the sub clause 5.6 "*Access Permissions Document*" in [OMA XDM_Core] with the clarification given in this sub clause.

### 6.7.1 Access Permissions Document for Address Book

The Access Permissions Document for Address Book SHALL be addressed using the User Directory Document Selector '/oma-ap/access-permissions' with Address Book AUID. The HTTP Request-URI for the document management operations SHALL be set with the following value:

- "http://[XCAP_Root_URI]/org.openmobilealliance.cab-address-book/users/[XUI]/oma_ap/access-permissions"

### 6.7.2 Access Permissions Document for PCC

The Access Permissions Document for PCC SHALL be addressed using the User Directory Document Selector '/oma-ap/access-permissions' with PCC AUID. The HTTP Request-URI for the document management operations SHALL be set with the following value:

- "http://[XCAP_Root_URI]/org.openmobilealliance.cab-pcc/users/[XUI]/oma_ap/access-permissions"

### 6.7.3 Access Permissions Document for CAB User Preferences

The Access Permissions Document for CAB User Preferences SHALL be addressed using the User Directory Document Selector '/oma-ap/access-permissions' with CAB User Preferences AUID. The HTTP Request-URI for the document management operations SHALL be set with the following value:

- "http://[XCAP_Root_URI]/org.openmobilealliance.cab-user-prefs/users/[XUI]/oma_ap/access-permissions"

## 6.8 UPP Directory Document Management

The procedure to manage the UPP Directory Document [OMA XDM UPP] at CAB Client SHALL conform to the sub clause 6.1.1 "*Document Management*". The HTTP Request-URI for the document management operations SHALL be set with the following value:

- "http://[XCAP_Root_URI]/org.openmobilealliance.upp-directory/users/[XUI]"

## 6.9 XDM Preferences Management

The CAB Client SHALL use the XDM Preferences Document to manage the forwarding preferences of AB and PCC Document for Contact Share operations and the history preferences of PCC Request History Information Document for reactive authorization as described in sub clause 5.8.3 "*Incoming Contact Subscription Requests*". The procedures to manage the XDM Preferences Document at CAB Client SHALL conform to the sub clause 6.1.1 "*Document Management*" and the sub clause 5.8 "*XDM Preferences Document*" in [OMA XDM_Core] with the clarification given in this sub clause.

### 6.9.1 XDM Preferences Document for Address Book

The XDM Preferences Document for Address Book SHALL be addressed using the User Directory Document Selector '/oma_xdm_pref/preferences' with Address Book AUID. The HTTP Request-URI for the document management operations SHALL be set with the following value:

- "http://[XCAP_Root_URI]/org.openmobilealliance.cab-address-book/users/[XUI]/oma_xdm_pref/preferences"

### 6.9.2 XDM Preferences Document for PCC

The XDM Preferences Document for PCC SHALL be addressed using the User Directory Document Selector '/oma_xdm_pref/preferences' with PCC AUID. The HTTP Request-URI for the document management operations SHALL be set with the following value:

- "http://[XCAP_Root_URI]/org.openmobilealliance.cab-pcc/users/[XUI]/oma_xdm_pref/preferences"

## 6.10 Subscription to CAB XML documents changes

There are two mechanisms (i.e. SIP and XDCP/Push) through which a CAB Client can subscribe to document changes stored in CAB XDMS(s), except AB XDMS. The CAB Client SHALL support one of the two mechanisms.

### 6.10.1 Subscriptions to CAB User's own PCC Document changes

The CAB Client SHALL generate the subscription requests to CAB User's own PCC Document changes, as described in [OMA XDM Core] sub clause 6.1.2 "*Subscribing to changes in XDM Resources*" with the following clarifications:

- If the SIP method is used, the Request-URI SHALL be set to the XUI of the CAB User with the URI Parameter: auid=<"org.openmobilealliance.cab-pcc">;
- If the XDCP/Push method is used, the AUID in the Request-URI as described in [OMA XDM Core] sub clause 6.1.1.3 "*XDM Operations using XDCP*" SHALL be set to the "org.openmobilealliance.cab-pcc".

### 6.10.2 Subscriptions to CAB User's own CAB User Preferences Document changes

The CAB Client SHALL generate the subscription requests to CAB User's own CAB User Preferences Document changes, as described in [OMA XDM Core] sub clause 6.1.2 "*Subscribing to changes in XDM Resources*" with the following clarifications:

- If the SIP method is used, the Request-URI SHALL be set to the XUI of the CAB User with the URI Parameter: auid=<"org.openmobilealliance.cab-user-prefs">;
- If the XDCP/Push method is used, the AUID in the Request-URI as described in [OMA XDM Core] sub clause 6.1.1.3 "*XDM Operations using XDCP*" SHALL be set to the "org.openmobilealliance.cab-user-prefs".

### 6.10.3 Subscriptions to CAB User's own CAB Feature Handler Document changes

The CAB Client SHALL generate the subscription requests to CAB User's own CAB Feature Handler Document changes, as described in [OMA XDM Core] sub clause 6.1.2 "*Subscribing to changes in XDM Resources*" with the following clarifications:

- If the SIP method is used, the Request-URI SHALL be set to the XUI of the CAB User with the URI Parameter: auid=<"org.openmobilealliance.cab-feature-handler">;
- If the XDCP/Push method is used, the AUID in the Request-URI as described in [OMA XDM Core] sub clause 6.1.1.3 "*XDM Operations using XDCP*" SHALL be set to the "org.openmobilealliance.cab-feature-handler".

### 6.10.4 Subscription to CAB User's own CAB XML documents using Subscription Proxy

If the Subscription Proxy was provisioned to the XDMC of the CAB Client and subscription to more than one CAB User's own CAB XML documents, the CAB client SHALL generate the subscription requests to the Subscription Proxy, as described in [OMA XDM Core] sub clause 6.1.2 "*Subscribing to changes in XDM Resources*" with the following clarifications:

- If the SIP method is used, the Request-URI SHALL be set to the SIP URI of the Subscription Proxy and the body of the SIP SUBSCRIBE request SHALL contain the resource list as defined in [OMA XDM Core] with all relevant XDM resource entries, in which the Document Selector SHALL be set to one or more document selectors in the following list:
    - o "org.openmobilealliance.cab-pcc/users/[XUI]/PCC.xml for the PCC Document,

- o “org.openmobilealliance.cab-user-prefs/users/[XUI]/CAB-UP.xml for the CAB User Preferences Document,
- o “org.openmobilealliance.cab-feature-handler /users/[XUI]/feature-handler.xml for the CAB Feature Handler Document,

The XUI SHALL be set to the XUI of the CAB User.

– If the XDCP/Push method is used, the Request-URI as described in [OMA XDM Core] sub clause 6.1.1.3 “*XDM Operations using XDCP*” SHALL be set to “http://[XCAP_Root_URI]/org.openmobilealliance.xdcp.sp”, targeting to the Subscription Proxy, and the payload of the XCAP request SHALL contain the resource list as defined in [OMA XDM Core] with all relevant XDM resource entries, in which the Document Selector SHALL be set to one or more document selectors in the following list:

- o “org.openmobilealliance.cab-pcc/users/[XUI]/PCC.xml for the PCC Document,
- o “org.openmobilealliance.cab-user-prefs/users/[XUI]/CAB-UP.xml for the CAB User Preferences Document,
- o “org.openmobilealliance.cab-feature-handler /users/[XUI]/feature-handler.xml for the CAB Feature Handler Document,

The XUI SHALL be set to the XUI of the CAB User.

## 6.11 Contact Search

When the CAB User requests contact search, CAB Client SHALL perform the following:

1. Construct a Search Request containing a Search Document according to the rules and procedures described in [OM A XDM Core] sub clause 5.4.1 “Search Document” and sub clause 6.1.3 “*Searching for Data in XML Documents*” with the following clarifications:
   a. When searching AB, the collection parameter SHALL be “org.openmobilealliance.cab-address-book/users/[XU I]/AB”, where [XUI] represents the XUI of a CAB User and AB represents the AB Document name. This searc h is limited to the CAB User’s AB.
   b. When searching PCC, the collection parameter SHALL be “org.openmobilealliance.cab-pcc/users/”.
   c. When searching External Directories the collection parameter SHALL be “org.openmobilealliance.cab-external -search/global/”, and SHALL use the <dataSource> child element CAB extension [XSD extSearch] of the <sea rch> element to indicate the specific external directory source to which the <request> is targeted or the specific external directory source from which the <response> is received.
2. Send the Search Request by using a HTTP POST request containing a Search Document to the Aggregation Proxy a ccording to the rules and procedures described in [OMA XDM Core] sub clause 6.1.3 “*Searching for Data in XML Documents*” with the following clarification:
   a. When searching PCC, the value of “domain” parameter SHALL be set to any of the following values: domain= [home, all, or target domains] and be subject to service provider policies.
   b. When searching External Directories, the value of “domain” parameter SHALL be “home”.

## 6.12 Contact Status Management

The CAB Client SHALL use the <contact-status> element from the AB Document to convey the status information of the AB contacts to the CAB User.

The following procedures SHALL be performed by the CAB Client, based on the values within the <entry-status> element of Contact Status:

- The CAB Client SHALL remove the <update> element associated with the Contact Entry from CAB User AB, when the CAB User consumes the updated contact.

- The CAB Client SHALL remove the <temporary> element associated with the Contact Entry, when the CAB User accept the temporary contact.
- The CAB Client SHALL remove the entire Contact Entry associated with the <temporary> element from the address book, when the CAB User rejects the temporary contact.

## 6.13 Authentication

### 6.13.1 Authentication for AB Synchronization

The CAB Client SHALL follow the authentication procedures described in [OMA DS Pro] sub clause 7 "*Authentication*".

### 6.13.2 Authentication for XML Document Management

The CAB Client SHALL follow the authentication procedures described in [OMA XDM Core] sub clause 5.1.1 "*Authentication*".

# 7. CAB XDMS

The CAB XDMS(s) SHALL support the XDMS procedures described in [OMA XDM Core], sub clause 6.2 "*Procedures at the XDM Server*", and the Application Usages described in [CAB XDMS].

# 8. CAB Management Object

The CAB Management Object (MO) for configuration and provisioning of CAB Client is described in [CAB MO].

# Appendix A. Change History (Informative)

## A.1 Approved Version 1.0 History

| Reference | Date | Description |
|---|---|---|
| OMA-TS-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 |

# Appendix B. Static Conformance Requirements (Normative)

The notation used in this appendix is specified in [SCRRULES].

The SCRs defined in the following tables includes SCR for:

- CAB Client
- CAB Server

## B.1 SCR for CAB Client

Note: All the Requirements that prefix with "XDM Core" are a reference to the [XDM Core] specification.

| Item | Function | Reference | Requirement |
|---|---|---|---|
| CAB-CS-C-001-M | Support for constructing and sending the contact search request to CAB AB Application Usage | Section 6.1 | XDM_Core-SRC-C-001-O<br>XDM_Core-SRC-C-002-O |
| CAB-CS-C-002-M | Support for constructing and sending the contact search request to CAB PCC Application Usage | Section 6.1 | XDM_Core-SRC-C-001-O<br>XDM_Core-SRC-C-002-O |
| CAB-CS-C003-M | Support for constructing and sending the contact search request to the External Directories | Section 6.1 | XDM_Core-SRC-C-002-O<br>XDM_Core-SRC-C-003-O |
| CAB-DM-C-001-M | Support for managing CAB PCC Document in PCC Application Usage | Section 6.2.1 | XDM_Core-XOP-C-001-M,<br>XDM_Core-XOP-C-002-M,<br>XDM_Core-XOP-C-003-M |
| CAB-DM-C-002-Y | Support for managing CAB User Preferences in CAB User Preferences Application Usage | Section 6.2.2 | XDM_Core-XOP-C-001-M,<br>XDM_Core-XOP-C-002-M,<br>XDM_Core-XOP-C-003-M |
| CAB-DM-C-003-M | Support for managing import requests in CAB Feature Handler Application Usage | Section 6.2.2.1 | XDM_Core-XOP-C-001-M,<br>XDM_Core-XOP-C-002-M,<br>XDM_Core-XOP-C-003-M |
| CAB-DM-C-004-M | Support for managing import responses in CAB Feature Handler Application Usage | Section 6.2.2.1 | XDM_Core-XOP-C-001-M,<br>XDM_Core-XOP-C-002-M,<br>XDM_Core-XOP-C-003-M<br>CAB-SUB-C-003-M<br>CAB-SUB-C-006-M |
| CAB-DM-C-005-M | Support for managing Contact Share requests in CAB Feature Handler Application Usage | Section 6.2.2.2 | XDM_Core-XOP-C-001-M,<br>XDM_Core-XOP-C-002-M, XDM_Core-XOP-C-003-M |
| CAB-DM-C-006-M | Support for managing Contact Share responses and delivery report in CAB Feature Handler Application Usage | Section 6.2.2.2 | XDM_Core-XOP-C-001-M,<br>XDM_Core-XOP-C-002-M,<br>XDM_Core-XOP-C-003-M<br>CAB-SUB-C-003-M<br>CAB-SUB-C-006-M |

| Item | Function | Reference | Requirement |
|---|---|---|---|
| CAB-DM-C-007-M | Support for managing Contact Subscription list in CAB User Preferences Application Usage | Section 6.2.2.3 | XDM_Core-XOP-C-001-M, XDM_Core-XOP-C-002-M, XDM_Core-XOP-C-003-M |
| CAB-DM-C-008-M | Support for managing AB Access Permissions | Section 6.2.3.1 | XDM_Core-XOP-C-001-M, XDM_Core-XOP-C-002-M, XDM_Core-XOP-C-003-M |
| CAB-DM-C-009-M | Support for managing PCC Access Permissions | Section 6.2.3.2 | XDM_Core-XOP-C-001-M, XDM_Core-XOP-C-002-M, XDM_Core-XOP-C-003-M |
| CAB-SUB-C-001-M | Support for subscribing to CAB User's own PCC Document changes | Section 6.3.1 | XDM_Core-SUB-C-001-O, XDM_Core-SUB-C-002-O, XDM_ Core-SUB-C-003-O |
| CAB-SUB-C-002-M | Support for subscribing to to and receiving notifications from CAB's own CAB User User Preferences Document changes | Section 6.3.2 | XDM_Core-SUB-C-001-O, XDM_Core-SUB-C-002-O, XDM_ Core-SUB-C-003-O |
| CAB-SUB-C-003-M | Support for subscribing to and receiving notifications from CAB User's own CAB Feature Handler Document changes | Section 6.3.3 | XDM_Core-SUB-C-001-O, XDM_Core-SUB-C-002-O, XDM_ Core-SUB-C-003-O |
| CAB-SUB-C-004-M | Support for subscribing to and receiving notifications from CAB PCC Document changes via Subscription Proxy | Section 6.3.4 | XDM_Core-SUB-C-001-O, XDM_Core-SUB-C-002-O, XDM_ Core-SUB-C-003-O |
| CAB-SUB-C-005-M | Support for subscribing to and receiving notifications from CAB User Preferences Document changes via Subscription Proxy | Section 6.3.4 | XDM_Core-SUB-C-001-O, XDM_Core-SUB-C-002-O, XDM_ Core-SUB-C-003-O |
| CAB-SUB-C-006-M | Support for subscribing to and receiving notifications from CAB Feature Handler Document changes via Subscription Proxy | Section 6.3.4 | XDM_Core-SUB-C-001-O, XDM_Core-SUB-C-002-O, XDM_ Core-SUB-C-003-O |
| CAB-SYNC-C-001-M | Support for synchronization with CAB Server using CAB-1 interface (OMA DS) | Section 6.4 | CAB-SYNC-C-002-O, OR CAB-SYNC-C-003-O<br><br>CAB-SYNC-C-004-M |
| CAB-SYNC-C-002-O | Support for AB synchronization with CAB Server using CAB Format | Section 6.4 | |
| CAB-SYNC-C-003-O | Support for AB synchronization with | Section 6.4 | |

| Item | Function | Reference | Requirement |
|---|---|---|---|
| | CAB Server using Legacy Format(s) | | |
| CAB-SYNC-C-004-M | Support for receiving 'Server-Alerted Sync' | Section 6.4 | |
| CAB-AUT-C-001-M | Support for authentication for synchronization (OMA DS) | Section 6.5.1 | |
| CAB-AUT-C-001-M | Support for authentication for XML document management (OMA XDM) | Section 6.5.2 | XDM_Core-SEC-C-001-M<br>XDM_Core-SEC-C-002-M<br>XDM_Core-SEC-C-003-O |
| CAB-COS-C-001-M | Support for Contact Status information | Section 6.6 | CAB-SYNC-C-001-M |

## B.2 SCR for CAB Server

| Item | Function | Reference | Requirement |
|---|---|---|---|
| | | | |
| CAB-SYNC-S-001-M | Support for synchronization with CAB Client using CAB-1 interface (OMA DS) | Section 5.1 | CAB-SYNC-S-002-M<br>CAB-SYNC-S-003-O<br>CAB-SYNC-S-004-O<br>CAB-SYNC-S-005-M |
| CAB-SYNC-S-002-M | Support for AB synchronization with CAB Client using CAB Format | Section 5.1 | |
| CAB-SYNC-S-003-O | Support for AB synchronization with CAB Client using Legacy Format(s) | Section 5.1 | |
| CAB-SYNC-S-004-O | Support for Format Adaptation | Section 5.1<br>Section 5.4.3 | |
| CAB-SYNC-S-005-M | Support for sending 'Server-Alerted Sync' | Section 5.1 | |
| CAB-SYNC-S-006-M | Support for managing AB Document in AB Application Usage | Section 5.1<br>Section 5.5 | CAB-XDMA-S-001-M |
| CAB-CSUB-S-001-M | Support for obtaining (i.e. using document management or subscription to changes) the list of contact subscriptions from CAB User's subscription list in the CAB User Preferences Application Usage | Section 5.2, Section 5.5 | CAB-XDMA-S-001-M |
| CAB-CSUB-S-002-O | Support for handling the contact subscription request with <filter-set> | Section 5.2 | |
| CAB-CSUB-S-003-M | Support for handling the | Section 5.2 | |

| Item | Function | Reference | Requirement |
|---|---|---|---|
| | contact (to be subscribed to) who is not a contact in AB XDMS | | |
| CAB-CSUB-S-004-M | Support for subscribing to CAB PCC Document changes | Section 5.2, Section 5.5 | CAB-XDMA-S-001-M, CAB-CSUB-S-005-M, CAB-CSUB-S-006-M |
| CAB-CSUB-S-005-M | Initial subscription using SIP SUBSCRIBE message for CAB PCC Document changes | Section 5.2, Section 5.5 | XDM_Core-SUB-A-001-O |
| CAB-CSUB-S-006-M | Processing Received Notification for CAB PCC Document changes (XDM v2.0) | Section 5.2, Section 5.5 | XDM_Core-SUB-A-002-O |
| CAB-CSUB-S-07-M | Support for storing or updating CAB AB Document using XDM document management operation with resulting data from Contact Subscriptions, and updating of contact subscription status | Section 5.2, Section 5.5 | CAB-XDMA-S-001-M |
| CAB-CSF-S-001-M | Support for obtaining the Contact Share request (i.e. using document management or subscription to changes) from CAB Feature Handler Application Usage | Section 5.3, Section 5.5 | CAB-XDMA-S-001-M |
| CAB-CSF-S-002-M | Support for determining the recipient type, i.e. CAB or non-CAB | Section 5.3 | |
| CAB-CSF-S-003-M | Support for retrieving the data from CAB PCC Application Usage to be shared with non-CAB recipients | Section 5.3, Section 5.5 | CAB-XDMA-S-001-M |
| CAB-CSF-S-004-M | Support for retrieving the data from CAB AB Application Usage to be shared with non-CAB recipients | Section 5.3, Section 5.5 | CAB-XDMA-S-001-M |
| CAB-CSF-S-005-M | Support for constructing the message defined in [OMA CPM CONV FCT TS] | Section 5.3 | |
| CAB-CSF-S-006-M | Support for sending the message defined in [OMA CPM CONV FCT TS] towards the CPM Interworking | Section 5.3 | |

| Item | Function | Reference | Requirement |
|---|---|---|---|
| | Selection Function [OMA CPM IWF TS] | | |
| CAB-CSF-S-007-M | Support for initiating XDCP Request for AB or PCC forwarding to the recipient CAB User | Section 5.3<br>Section 5.5 | CAB-XDMA-S-001-M |
| CAB-CSF-S-008-M | Supporting for storing the response and delivery report in CAB Feature Handler Application Usage | Section 5.3<br>Section 5.5 | CAB-XDMA-S-001-M |
| CAB-IWF-S-001-M | Support for obtaining the request to import the contacts from non-CAB system (i.e. using document management or subscription to changes) from CAB Feature Handler Application Usage | Section 5.4.1, Section 5.5 | CAB-XDMA-S-001-M |
| CAB-IWF-S-002-M | Supporting the storage of imported contacts in AB Application Usage and updating the contact status | Section 5.4.1<br>Section 5.5 | CAB-XDMA-S-001-M |
| CAB-CSF-S-003-M | Supporting for storing the response and delivery report in CAB Feature Handler Application Usage | Section 5.4.1<br>Section 5.5 | CAB-XDMA-S-001-M |
| CAB-IWF-S-004-Y | Support for receiving and processing search request via XDM-7i (Limited XQuery over HTTP) (XDM v2.1) for External Directories Search | Section 5.4.2 | XDM_Core-SRC-S-001-O, XDM_Core-SRC-S-003-O |
| CAB-IWF-S-005-M | Support for CAB extension <dataSource> to the Search Document for External Directories Search | Section 5.4.2.1.5 | |
| CAB-IWF-S-006-M | Support for translating/mapping the received Search request (XDM-7i) to the external Search request based upon the format supported by the External Directories | Section 5.4.2 | |
| CAB-IWF-S-007-M | Support for generating the response to Search Proxy via XDM-7i (XDM v2.1) | Section 5.4.2 | XDM_Core-SRC-S-001-O, XDM_Core-SRC-S-003-O |

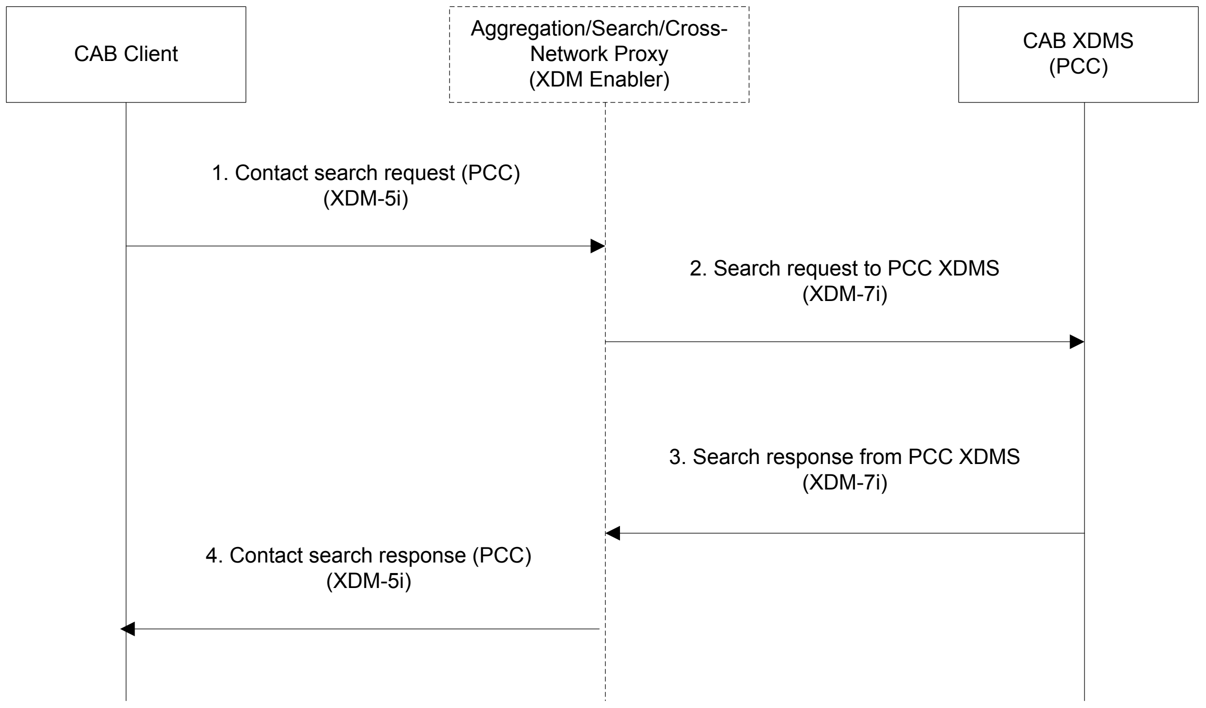
| Item | Function | Reference | Requirement |
|---|---|---|---|
| CAB-IWF-S-008-Y | Support for the format adaptation between CAB format and Legacy format(s) | Section 5.4.3 | |
| CAB-XDMA-S-001-M | Support for XDM Agent | Section 5.5 | XDM_Core-XOP-A-001-M<br>XDM_Core-XOP-A-002-M<br>XDM_Core-XOP-A-003-M<br>XDM_Core-SUB-A-001-O<br>XDM_Core-SUB-A-002-O<br>XDM_ Core-SEC-A-003-M<br>XDM_ Core-RES-A-001-O |
| CAB-COS-S-001-M | Support for managing the Contact Status information | Section 5.8 | |
| CAB-COS-S-002-M | Support for generating and sending SIP Message with Contact Added data to a remote domain | Section 5.8 | |
| CAB-COS-S-003-M | Support for receiving SIP Message with Contact Added data from a remote domain | Section 5.8 | |
| CAB-COS-S-004-O | Support for CAB Capability publication as SIP Publish | Section 5.8.2<br>Section 5.5 | CAB-HLF-016 |
| CAB-COS-S-005-O | Support for CAB Capability publication as Permanent Presence State | Section 5.8.2<br>Section 5.6 | CAB-HLF-016 |
| CAB-COS-S-006-O | Support for subscription to Presence to obtain CAB Capability of contacts | Section 5.8.2<br>Section 5.7 | CAB-HLF-016 |

# Appendix C. Flows (Informative)

## C.1 Contact Search

The following provides three basic message flows for contact search based on the target destination i.e. PCC, AB, and External directories. Any combination of these flows may be employed by the CAB Enabler implementations.

### C.1.1 Contact Search - PCC


CAB Client
Aggregation/Search/Cross-Network Proxy (XDM Enabler)
CAB XDMS (PCC)
1. Contact search request (PCC) (XDM-5i)
2. Search request to PCC XDMS (XDM-7i)
3. Search response from PCC XDMS (XDM-7i)
4. Contact search response (PCC) (XDM-5i)

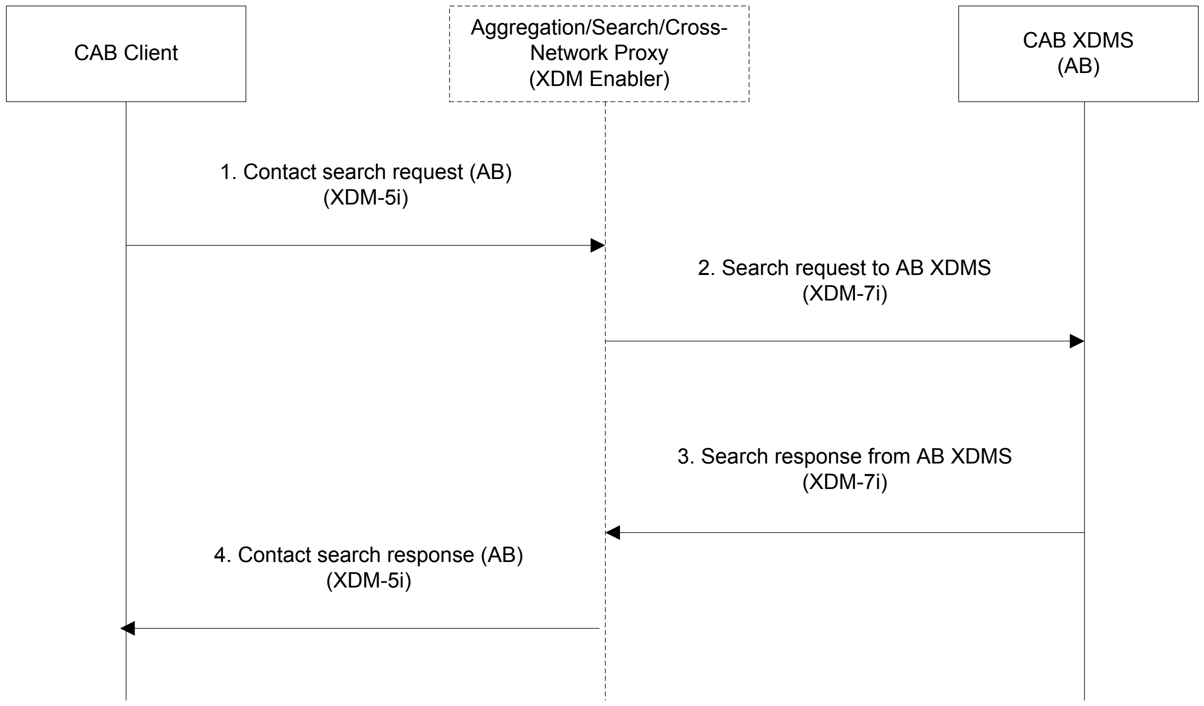
Step1: The CAB Client makes a contact search request to CAB Users' PCC(s) via the XDM Enabler proxies (Aggregation Proxy, Search Proxy, Cross-Network Proxy) using Limited XQuery. The request is formulated based on the PCC XML schema hosted by the PCC Application Usage. This request is based on XDM-5i.

Step 2: Upon receiving the contact search request, the Search Proxy routes the request to the PCC Application Usage as indicated in the original request.

Step 3: The search response including the search results from the PCC Application Usage is delivered in the response to the Search proxy. The search results may be further formatted or aggregated in the Search proxy. The PCC search results are subject to CAB User's PCC Access Permissions.

Step 4: The contact search response (PCC) is sent back to the CAB Client which includes the list of results corresponding to the initial search request in Step1. The response is based on XDM-5i.

## C.1.2 Contact Search - AB


CAB Client
Aggregation/Search/Cross-Network Proxy (XDM Enabler)
CAB XDMS (AB)
1. Contact search request (AB) (XDM-5i)
2. Search request to AB XDMS (XDM-7i)
3. Search response from AB XDMS (XDM-7i)
4. Contact search response (AB) (XDM-5i)

Step1: The CAB Client makes a contact search request to the CAB User's own AB via the XDM Enabler proxies (Aggregation Proxy,Search Proxy, Cross-Network Proxy)using Limited XQuery. The request is formulated based on the AB XML schema hosted by the AB Application Usage. This request is based on XDM-5i.

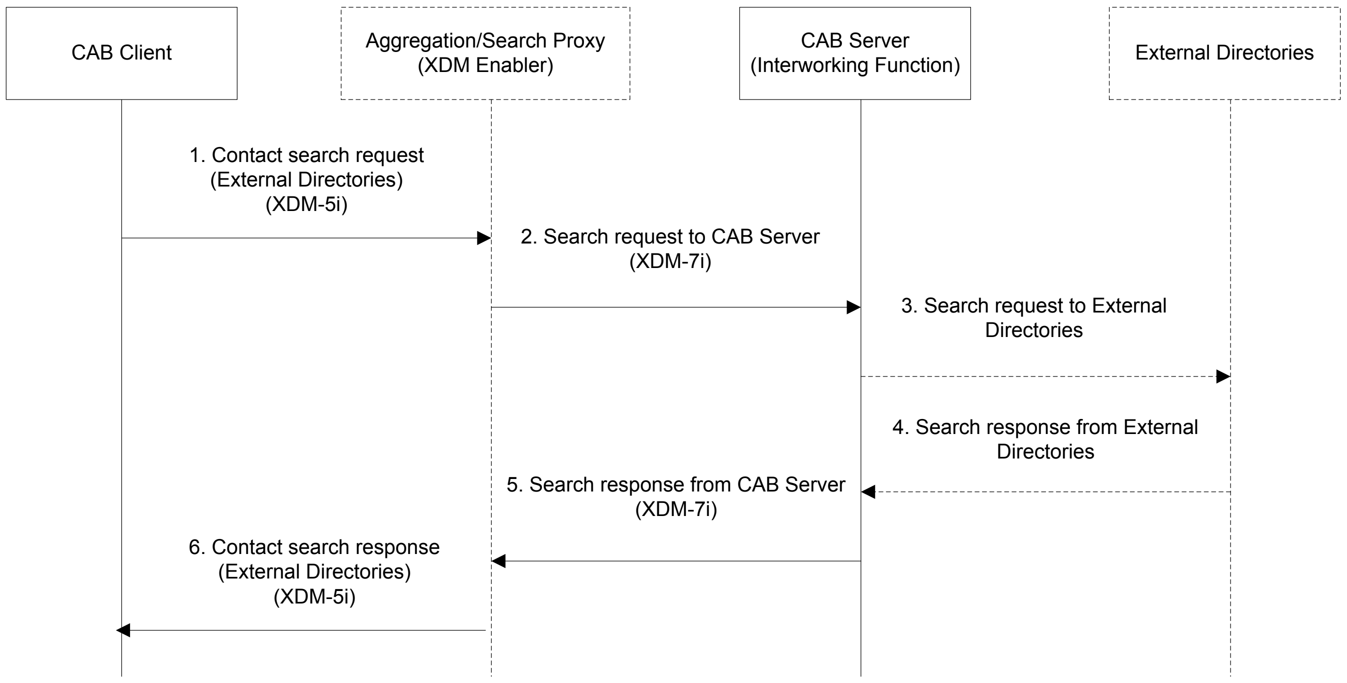
Step 2: Upon receiving the contact search request, the Search Proxy routes the request to the AB Application Usage as indicated in the original request.

Step 3: The search response including the search results from the AB Application Usage is delivered in the response to the Search Proxy. The search results may be further formatted or aggregated in the Search Proxy. The AB search results are subject to CAB User's AB Access Permissions.

Step 4: The contact search response (AB) is sent back to the CAB Client which includes the list of results corresponding to the initial search request in Step1. The response is based on XDM-5i.

Note: The format of the search request for AB needs to identify the target as a specific CAB User's AB Document, to satisfy the Use Case where the CAB User A might have given Access permissions to other CAB User B to search the CAB User A's AB data.

## C.1.3 Contact Search – External Directories


CAB Client
Aggregation/Search Proxy (XDM Enabler)
CAB Server (Interworking Function)
External Directories
1. Contact search request (External Directories) (XDM-5i)
2. Search request to CAB Server (XDM-7i)
3. Search request to External Directories
4. Search response from External Directories
5. Search response from CAB Server (XDM-7i)
6. Contact search response (External Directories) (XDM-5i)

Step1: The CAB Client makes a contact search request towards External Directories via the Aggregation/Search Proxy using Limited XQuery. The request is formulated based on the standard XML search format (for External directories) hosted by the Interworking Function. This request is based on XDM-5i.

Step 2: Upon receiving the contact search request, the Search Proxy routes the request to the CAB Server (i.e. Interworking Function) as indicated in the original request via XDM-7i. The Interworking Function translates the standard XML search request to external search request. The interactions and mapping between standard XML search request and external search request is out of scope.

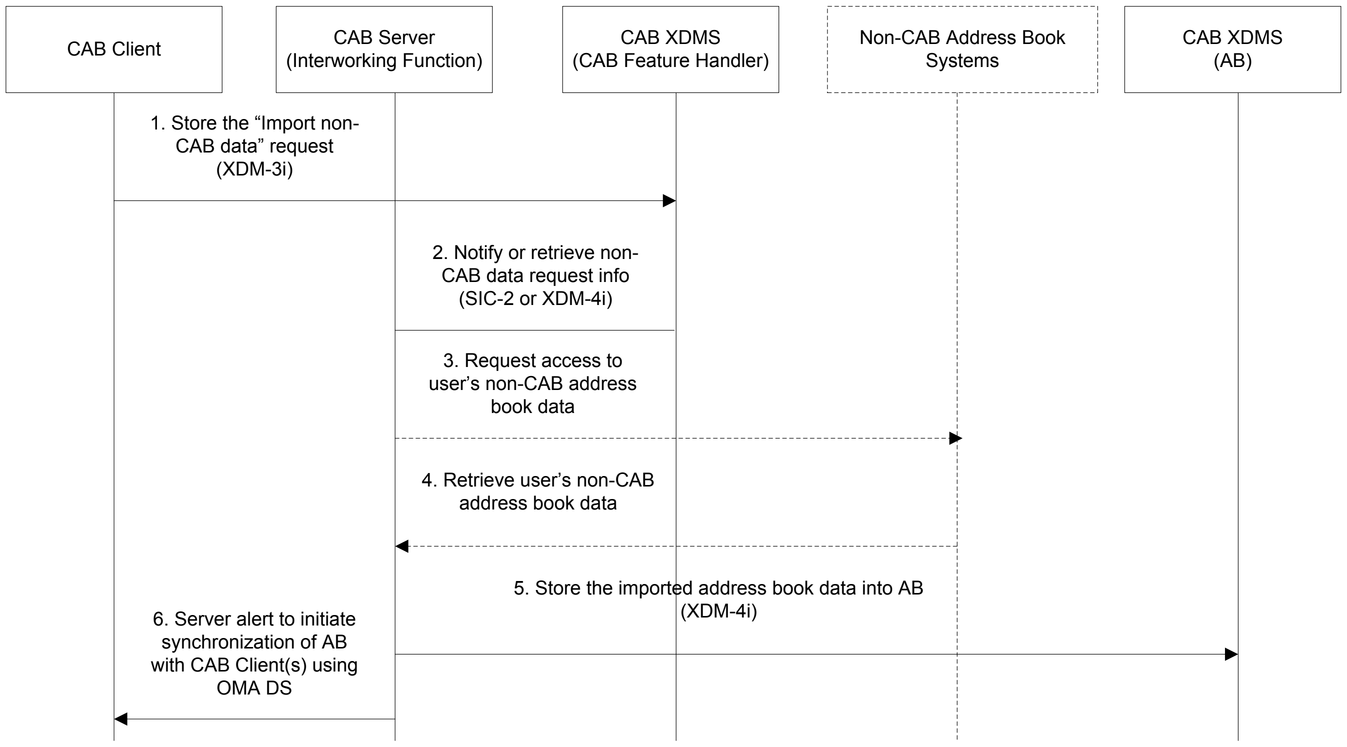
Step 3: The Interworking Function initiates the translated search request(s) to the External Directories over the appropriate interface(s). The translation and initiation of search requests over such external interfaces is out of scope of this specification.

Step 4: The search responses from the External Directories are received by the Interworking Function. If more than one search responses are received, the Interworking Function shall aggregate all responses into one search result. The aggregation of responses based on the external interfaces and data models is out of scope of this specification.

Step 5: The Interworking Function returns the search result(s) from External Directories to the Search Proxy. The response is based on XDM-7i. The search result(s) may be further formatted or composed in the Search Proxy.

Step 6: The contact search response (External Directories) is sent back to the CAB Client and includes the result(s) corresponding to the initial search request in Step1. The response is based on XDM-5i.

## C.2 Import from non-CAB Address Book Systems


CAB Client
CAB Server (Interworking Function)
CAB XDMS (CAB Feature Handler)
Non-CAB Address Book Systems
CAB XDMS (AB)
1. Store the "Import non-CAB data" request (XDM-3i)
2. Notify or retrieve non-CAB data request info (SIC-2 or XDM-4i)
3. Request access to user's non-CAB address book data
4. Retrieve user's non-CAB address book data
5. Store the imported address book data into AB (XDM-4i)
6. Server alert to initiate synchronization of AB with CAB Client(s) using OMA DS

Step 1: The CAB Client makes an "import non-CAB AB data" request by writing/storing the request information formatted to the <import-non-cab> element as described in the CAB Feature Handler Application Usage [CAB XDMS].

Step 2: The CAB Server retrieves the "import non-CAB AB data" request information from the CAB Feature Handler Application Usage by either of the following methods:

> Step 2a: CAB Feature Handler Application Usage notifies a change to the CAB Feature Handler Document to the CAB Server assuming a prior subscription to the changes is in place by the CAB Server.
>
> Step 2b: CAB Feature Handler Application Usage is polled by the CAB Server for changes in the CAB Feature Handler Document based on a pre-determined time interval using XCAP.

Step 3: The CAB Server (i.e. Interworking Function) on behalf of the CAB User requests the non-CAB address book system(s) access to the CAB User's legacy address book data, by supplying the necessary access parameters.

Step 4: Upon obtaining the access, the CAB Server (i.e. Interworking Function) retrieves/receives the non-CAB address book data of the CAB User from the non-CAB address book system(s).

Step 4a: The CAB Server (i.e. Interworking Function) transforms the imported data into the CAB Format.

Step 5: The CAB Server stores the resulting data in the AB Application Usage [CAB XDMS] subject to CAB User's preferences.

Step 6: The data in the CAB User's AB is then subsequently synchronized with the CAB Client(s) using OMA DS server-alerted notification sent by the AB Synchronization Function of the CAB Server to the CAB Client to initiate synchronization as described in section 5.1 "*AB Synchronization Function*".

## C.3 Sample XCAP flows for management of CAB XML documents

The flows in figure below describe the management operations on the data in the CAB XML documents, based on [OMA XDM Core] document management operations: create, retrieve, update, and delete.

Note: The AB Document data management operations are captured in the flows of sub clause C.6.1 "*CAB Client Address Book Modifications and Synchronization*". The flows in this section apply to all the CAB XML documents except the AB Document.

### C.3.1 XCAP operations on CAB XML documents

The management operations on the CAB XML documents are realized through XCAP operations as described in Appendix C.2 "*Sample XCAP Message Flow*" of [OMA XDM Core]. This example describes the message flows used by the CAB Client to manipulate a CAB XML document in CAB XDMS(s) after authentication.

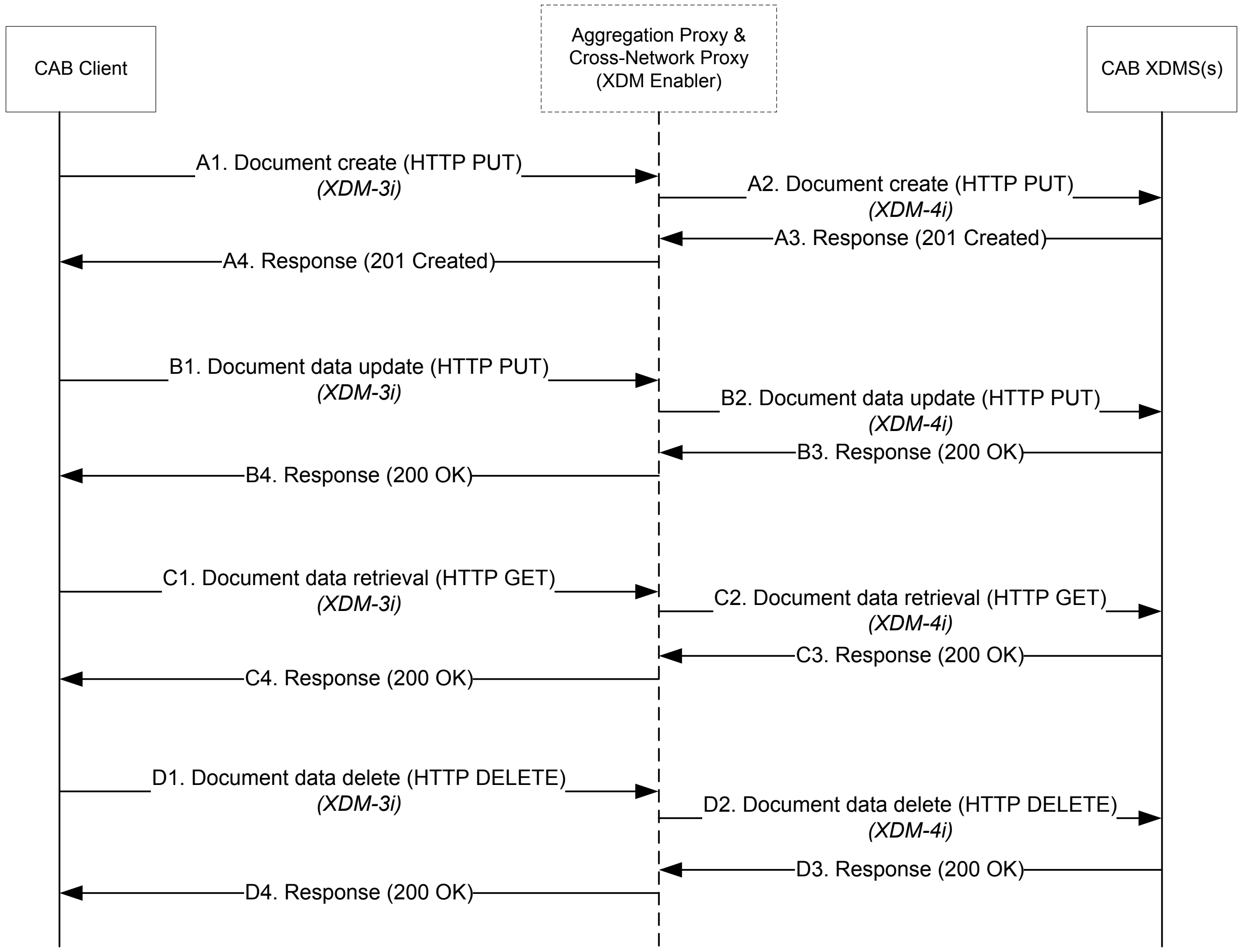

CAB Client
Aggregation Proxy & Cross-Network Proxy (XDM Enabler)
CAB XDMS(s)
A1. Document create (HTTP PUT) (XDM-3i)
A2. Document create (HTTP PUT) (XDM-4i)
A3. Response (201 Created)
A4. Response (201 Created)
B1. Document data update (HTTP PUT) (XDM-3i)
B2. Document data update (HTTP PUT) (XDM-4i)
B3. Response (200 OK)
B4. Response (200 OK)
C1. Document data retrieval (HTTP GET) (XDM-3i)
C2. Document data retrieval (HTTP GET) (XDM-4i)
C3. Response (200 OK)
C4. Response (200 OK)
D1. Document data delete (HTTP DELETE) (XDM-3i)
D2. Document data delete (HTTP DELETE) (XDM-4i)
D3. Response (200 OK)
D4. Response (200 OK)

**Figure 2: CAB Client manipulating a CAB XML document**

NOTE 1 : All the operations are shown in one diagram for the convenience of the reader, but there is no implication that all of them have to be performed in sequence.

NOTE 2: The Cross-Network Proxy is present in the flows in the case of an authorized Principal managing PCC Documents from a remote domain.

The following description of steps is based on the rules and procedures as defined in section 6.1 "*Procedures at the XDMC and the XDM Agent*" and section C.2 "*Sample XCAP Message Flow*" of [OMA XDM Core] and use as example operations on CAB User Preferences XML Document [CAB XDMS]

**Operation A: Creation of a document in CAB XDMS(s)**

A1) The CAB Client sends an HTTP PUT request using the XDM-3i interface, via the Aggregation Proxy/Cross-Network Proxy to create a new CAB XML document "index" for a user in any of the CAB XDMS(s).

The example below is an HTTP PUT operation on the CAB User Preferences XML Document that is owned by user with XUI of "sip:joebloggs@example.com" in the example.com domain.

```
PUT /org.openmobilealliance.cab-user-prefs/users/sip:joebloggs@example.com/index HTTP/1.1
Host: xcap.example.com
…
Content-Type: application/vnd.oma.cab-user-prefs+xml; charset="utf-8"
Content-Length: (…)

<?xml version="1.0" encoding="UTF-8"?>
<cab-user-prefs xmlns="urn:oma:xml:cab:cab-user-prefs">
 <cab-upp>
   <cab-upp-set>
       <profile id='1234'>
            <display-name> CAB UPP of Joe </display-name>
       </profile>
   </cab-upp-set>
 </cab-upp >
</cab-user-prefs >
```

A2) Assuming that the CAB Client was successfully authenticated, the CAB XDMS(s) receive the request over the XDM-4i interface from the XDM proxies (Aggregation Proxy/Cross-Network proxy).

A3) The CAB XDMS(s) acknowledge the creation of the index document with a HTTP "201 Created" message, assuming that the CAB Client had the right Access Permissions to perform the create operation and the operation was successful.

```
HTTP/1.1 201 Created
Etag: "cdcdcdcd"
…
Content-Length: 0
```

A4) The HTTP "201 Created" message is received by the CAB Client.

**Operation B: Document data update in CAB XDMS(s)**

B1) The CAB Client sends a HTTP PUT request over the XDM-3i interface, via the Aggregation Proxy/Cross-Network Proxy to the just-created "index" document in "sip:joebloggs@example.com"'s home directory to add a new XUI "sip:friends01@example.com" to the <entry> element of <subscription-list> element.

```
PUT /org.openmobilealliance.cab-user-prefs/users/sip:joebloggs@example.com/index /~~/cab-user-prefs
   /cap-upp HTTP/1.1
Host: xcap.example.com
…
Content-Type: application/xcap-el+xml; charset="utf-8"
Content-Length: (…)

<cab-upp>
  <subscription-list>
       <entry id='sip:friends01@example.com'/>
   </subscritpion-list>
</cab-upp>
```

B2) Assuming that the CAB Client was successfully authenticated, the CAB XDMS(s) receive the request over the XDM-4i interface from the XDM proxies (Aggregation Proxy/Cross-Network proxy).

B3) The CAB XDMS(s) acknowledge the data update request of the index document with a HTTP “200 OK” reply, assuming that the CAB Client had the right Access Permissions to perform the update operation and the operation was successful.

```
HTTP/1.1 200 OK
Etag: "efefefef"

…
Content-Length: 0
```

B4) The HTTP “200 OK” message is received by the CAB Client.

**Operation C: Document data retrieval from CAB XDMS(s)**

C1) The CAB Client sends a HTTP GET request over the XDM-3i interface, via the Aggregation Proxy/Cross-Network Proxy to retrieve the <subscription-list> information from the CAB User Preferences Application Usage.

```
GET /org.openmobilealliance.cab-user-prefs/users/sip:joebloggs@example.com/index/~~/cab-user-
   prefs/cab-upp/subscription-list HTTP/1.1
Host xcap.example.com
```

C2) Assuming that the CAB Client was successfully authenticated, the CAB XDMS(s) receive the request over the XDM-4i interface from the XDM proxies (Aggregation Proxy/Cross-Network proxy).

C3) The CAB XDMS(s) returns the data in the body of an HTTP “200 OK” reply, assuming that the CAB Client had the right Access Permissions to perform the retrieval operation and the operation was successful.

```
HTTP/1.1 200 OK
…
Etag: "efefefef"
Content-Type: application/xcap-el+xml; charset="utf-8"
Content-Length: (…)
<cab-upp>
   <subscription-list>
       <entry id=’sip:friends01@example.com’/>
   </subscription-list>
</cab-upp>
```

C4) The HTTP “200 OK” message is received by CAB Client.

**Operation D: Document data deletion from CAB XDMS(s)**

D1) The CAB Client sends a HTTP DELETE request over the XDM-3i interface, via the Aggregation Proxy/Cross-Network Proxy to delete an <entry> element identified by (i.e. with an 'id' attribute value) 'sip:friends01@example.com' from "sip:joebloggs@example.com"'s <subscription-list> element in the CAB User Preferences Application Usage.

```
DELETE /org.openmobilealliance.cab-user-prefs/users/sip:joebloggs@example.com/index/~~/cab-user-
   prefs/cab-upp/subscription-list/entry/%5B@id=%22sip:friends01@example.com%22%5D HTTP/1.1
Host: xcap.example.com
```

D2) Assuming that the CAB Client was successfully authenticated, the CAB XDMS(s) receive the delete request over the XDM-4i interface from the XDM proxies (Aggregation Proxy/Cross-Network proxy).

D3) The CAB XDMS(s), after checking the Access Permissions of the CAB Client, perform the deletion and acknowledges it by returning the body of an HTTP "200 OK" reply.

```
HTTP/1.1 200 OK
Etag: "ghghgh"
…
Content-Length: 0
```

D4) The HTTP "200 OK" message is received by CAB Client.

## C.4 Sample Contact Share flows

The sample flows below capture the Contact Share operations covering all supported scenarios:

- Sending Side:

- Contact Share towards a CAB User
- Contact Share towards a non-CAB User

- Receiving side

- Contact Share received by a CAB User.

The CAB User data that can be shared by the CAB Enabler is:

- AB data (Contact Entries)
- PCC data (Contact Views)

The sample flows below use the case where AB Contact Entries or PCC Contact Views are the subject of Contact Share data.

Note: The determination of the recipient type (.i.e. if a CAB User or not), can be achieved in many ways, but none is mandated by the CAB Enabler. This applies to both flows (CAB to CAB and CAB to non-CAB) between steps 4 and 5.

### C.4.1 Contact Share towards a CAB User

#### C.4.1.1 Originating Side

##### C.4.1.1.1 AB forwarding

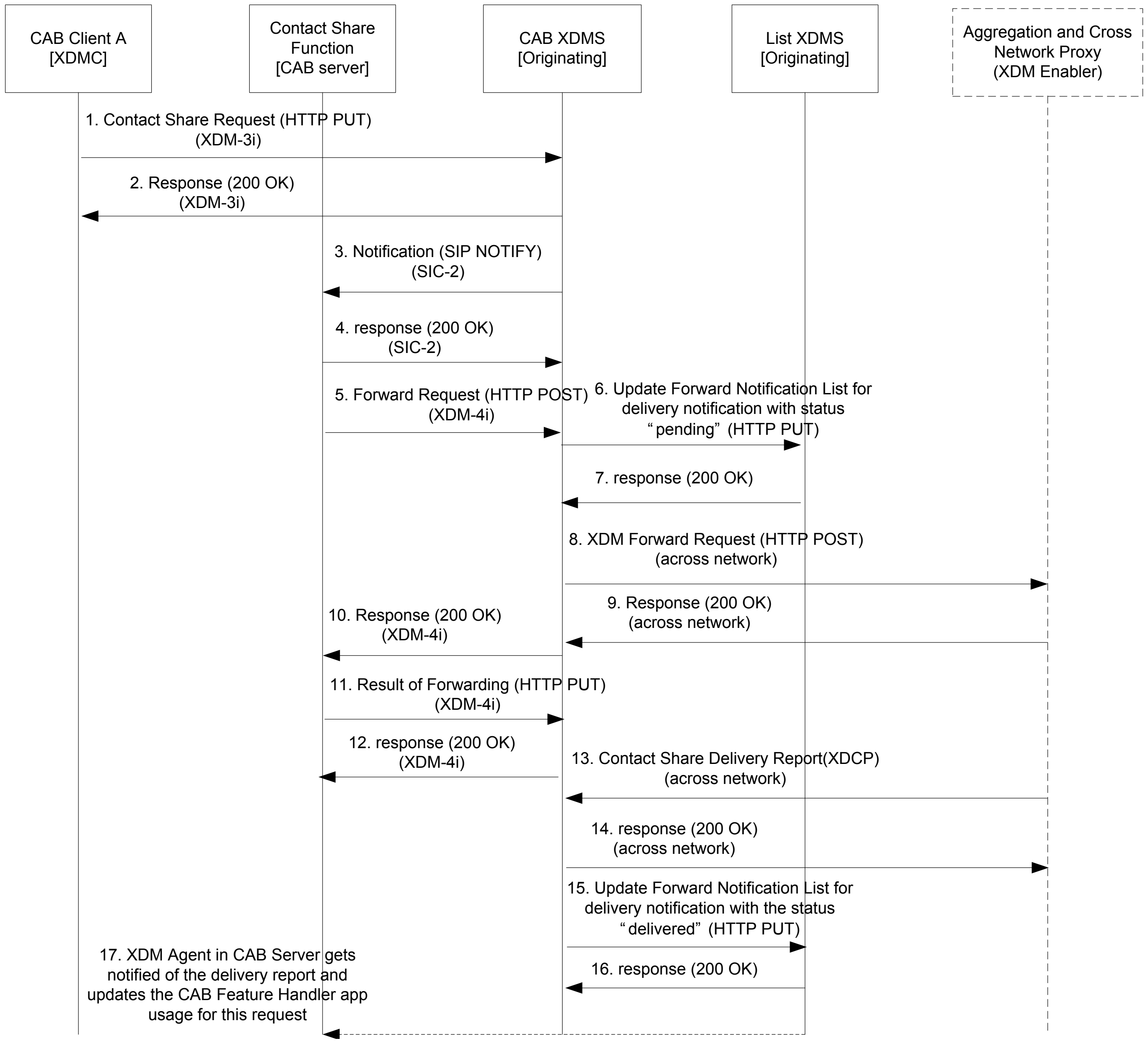

CAB Client A [XDMC]
Contact Share Function [CAB server]
CAB XDMS [Originating]
List XDMS [Originating]
Aggregation and Cross Network Proxy (XDM Enabler)
1. Contact Share Request (HTTP PUT) (XDM-3i)
2. Response (200 OK) (XDM-3i)
3. Notification (SIP NOTIFY) (SIC-2)
4. response (200 OK) (SIC-2)
5. Forward Request (HTTP POST) (XDM-4i)
6. Update Forward Notification List for delivery notification with status "pending" (HTTP PUT)
7. response (200 OK)
8. XDM Forward Request (HTTP POST) (across network)
9. Response (200 OK) (across network)
10. Response (200 OK) (XDM-4i)
11. Result of Forwarding (HTTP PUT) (XDM-4i)
12. response (200 OK) (XDM-4i)
13. Contact Share Delivery Report(XDCP) (across network)
14. response (200 OK) (across network)
15. Update Forward Notification List for delivery notification with the status "delivered" (HTTP PUT)
16. response (200 OK)
17. XDM Agent in CAB Server gets notified of the delivery report and updates the CAB Feature Handler app usage for this request

**Figure 3 : Flows of AB Forwarding in the originating side towards a CAB user**

Step 1; CAB Client A performs a HTTP PUT containing Contact Share data in CAB Feature Handler Document in the CAB XDMS, using XDM-3i interface

Step 2: CAB XDMS (CAB Feature Handler Application Usage) sends the response back to CAB Client using XDM-3i interface.

Step 3: CAB XDMS (CAB Feature Handler Application Usage) notifies Contact Share Function (through the CAB Server's XDM Agent) about document changes using SIC-2 interface.

Note: alternatively, the CAB Server can poll via XDM-4i the CAB Feature Handler Document and perform the steps below after detecting a change in the data.

Step 4: Contact Share Function sends the response (200 OK) to CAB XDMS (CAB Feature Handler Application Usage) using SIC-2 interface

Step 5: Contact Share Function uses the CAB Server's XDM Agent to initiate an XDCP Request (HTTP POST) for forwarding Contact Share data to the corresponding CAB XDMS through the XDM-4i interface.

Step 6: CAB XDMS (AB Application Usage) updates the Forwarding Notification List of CAB Client A for delivery notification with the status "pending".

Step 7: The List XDMS updates the Forwarding Notification List by adding the <delivery-notification> entry received and sends 200 OK response.

Step 8: Since the recipient is in different domain CAB XDMS (AB Application Usage) creates the Contact Share data to be forwarded in a temporary storage and then does the Forward XDCP Request to the recipient' CAB XDMS(s) in the remote domain, using the XDM Enabler interfaces (e.g. XDM-8.2i) as described in the [OMA XDM AD].

Step 9: CAB XDMS (AB Application Usage) of CAB Client A receives the response (200 OK) with result of forwarding back from the terminating network.

Step 10: Upon receiving the remote forward response, the CAB XDMS (AB Application Usage) of CAB Client A creates 200 OK response to the forward request and sends it to the Contact Share Function of CAB Server.

Step 11: Contact Share Function performs an XCAP PUT using XDM-4i containing the result of forwarding in the <response> element of the CAB Feature Handler Document in the CAB XDMS.

Step 12: CAB Feature Handler Application Usage from the CAB XDMS responds with 200 OK response back to Contact Share Function using XDM-4i interface.

Step 13: Since CAB Client A has requested for the delivery report, CAB XDMS (AB Application Usage) of CAB Client A receives the Contact Share delivery report request (XDCP) from the terminating network.

Step 14: CAB XDMS (AB Application Usage) of CAB Client A sends 200 OK response with the XDCP Response containing <done> element.

Step 15: CAB XDMS (AB Application Usage) of CAB Client A updates the Forwarding Notification List entry created in the Step 6 of this flow by changing the status attribute value to "delivered"

Step 16: The List XDMS sends 200 OK response.

Step 17: CAB Server of User A would get notified about the contact share delivery status (the subscription to Forwarding Notification List Document changes for CAB User's Forwarding Notification List Document from the CAB Server is assumed to have occurred prior to the notification). The CAB Server updates the delivery status in the CAB Feature Handler Document for the corresponding request.

##### C.4.1.1.2 PCC forwarding

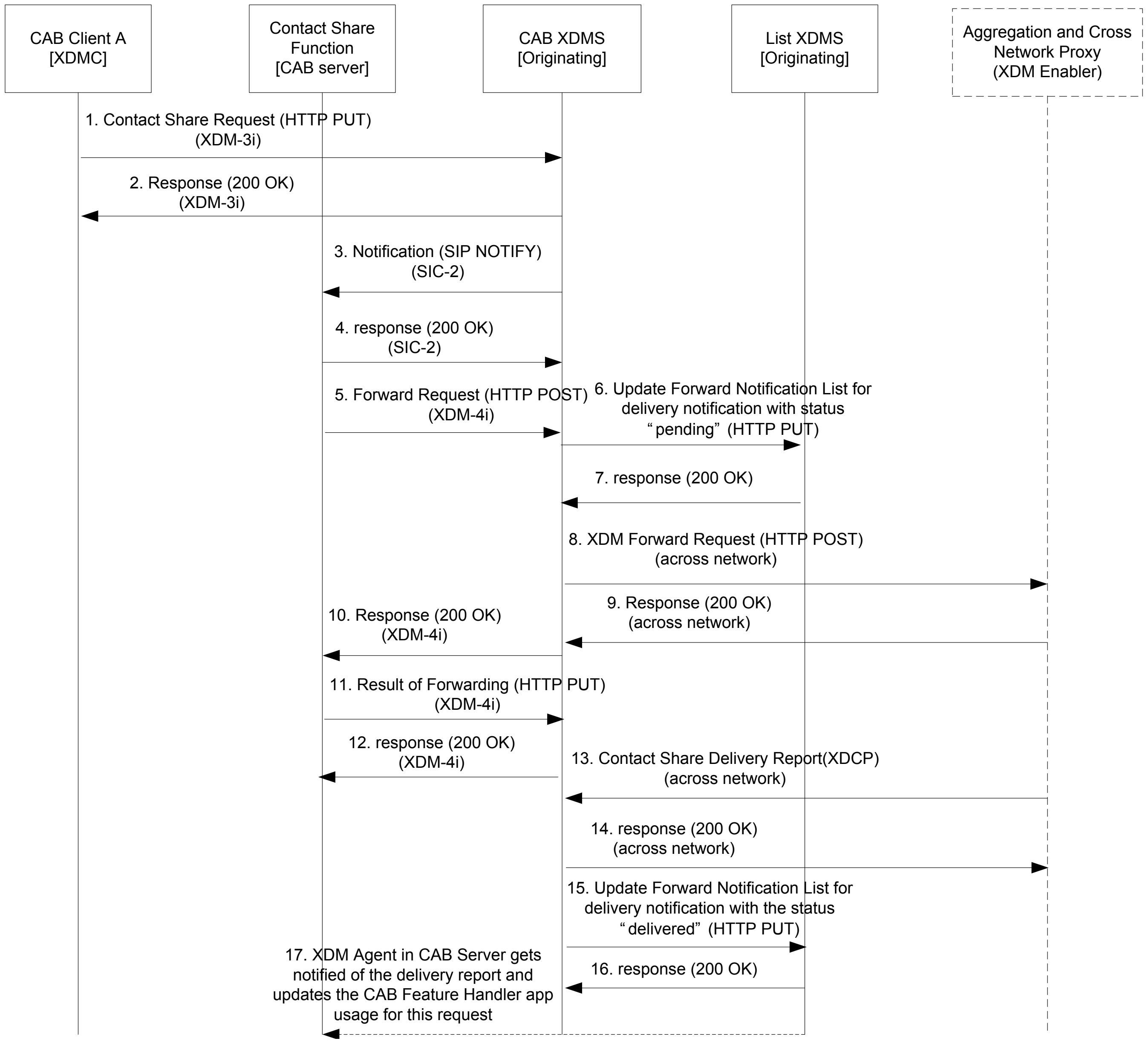

CAB Client A [XDMC]
Contact Share Function [CAB server]
CAB XDMS [Originating]
List XDMS [Originating]
Aggregation and Cross Network Proxy (XDM Enabler)
1. Contact Share Request (HTTP PUT) (XDM-3i)
2. Response (200 OK) (XDM-3i)
3. Notification (SIP NOTIFY) (SIC-2)
4. response (200 OK) (SIC-2)
5. Forward Request (HTTP POST) (XDM-4i)
6. Update Forward Notification List for delivery notification with status "pending" (HTTP PUT)
7. response (200 OK)
8. XDM Forward Request (HTTP POST) (across network)
9. Response (200 OK) (across network)
10. Response (200 OK) (XDM-4i)
11. Result of Forwarding (HTTP PUT) (XDM-4i)
12. response (200 OK) (XDM-4i)
13. Contact Share Delivery Report(XDCP) (across network)
14. response (200 OK) (across network)
15. Update Forward Notification List for delivery notification with the status "delivered" (HTTP PUT)
16. response (200 OK)
17. XDM Agent in CAB Server gets notified of the delivery report and updates the CAB Feature Handler app usage for this request

**Figure 4: Flows of PCC forwarding in the originating side towards a CAB user**

Step 1; CAB Client A performs a HTTP PUT containing Contact Share data in CAB Feature Handler Document in the CAB XDMS, using XDM-3i interface

Step 2: CAB XDMS (CAB Feature Handler Application Usage) sends the response back to CAB Client using XDM-3i interface.

Step 3: CAB XDMS (CAB Feature Handler Application Usage) notifies Contact Share Function (through the CAB Server's XDM Agent) about document changes using SIC-2 interface.

Note: alternatively, the CAB Server can poll via XDM-4i the CAB Feature Handler Document and perform the steps below after detecting a change in the data.

Step 4: Contact Share Function sends the response (200 OK) to CAB XDMS (CAB Feature Handler Application Usage) using SIC-2 interface

Step 5: Contact Share Function uses the CAB Server's XDM Agent to initiate an XDCP Request (HTTP POST) for forwarding Contact Share data to the corresponding CAB XDMS through the XDM-4i interface.

Step 6: CAB XDMS (PCC Application Usage) updates the Forwarding Notification List of CAB Client A for delivery notification with the status "pending".

Step 7: The List XDMS updates the Forwarding Notification List by adding the <delivery-notification> entry received and sends 200 OK response.

Step 8: Since the recipient is in different domain CAB XDMS (PCC Application Usage) creates the Contact Share data to be forwarded in a temporary storage and then does the Forward XDCP request to the recipient' CAB XDMS(s) in the remote domain, using the XDM Enabler interfaces (e.g. XDM-8.2i) as described in the [OMA XDM AD].

Step 9: CAB XDMS (PCC Application Usage) of CAB Client A receives the response (200 OK) with result of forwarding back from the terminating network.

Step 10: Upon receiving the remote forward response, the CAB XDMS (PCC Application Usage) of CAB Client A creates 200 OK response to the forward request and sends it to the Contact Share Function of CAB Server.

Step 11: Contact Share Function performs an XCAP PUT using XDM-4i containing the result of forwarding in the <response> element of the CAB Feature Handler Document in the CAB XDMS.

Step 12: CAB Feature Handler Application Usage from the CAB XDMS responds with 200 OK response back to Contact Share Function using XDM-4i interface.

Step 13: Since CAB Client A has requested for the delivery report, CAB XDMS (PCC Application Usage) of CAB Client A receives the Contact Share delivery report request (XDCP) from the terminating network.

Step 14: CAB XDMS (PCC Application Usage) of CAB Client A sends 200 OK response with the XDCP Response containing <done> element.

Step 15: CAB XDMS (PCC Application Usage) of CAB Client A updates the Forwarding Notification List entry created in the Step 6 of this flow by changing the status attribute value to "delivered"

Step 16: The List XDMS sends 200 OK response.

Step 17: CAB Server of User A would get notified about the contact share delivery status (the subscription to Forwarding Notification List Document changes for CAB User's Forwarding Notification List Document from the CAB Server is assumed to have occurred prior to the notification). The CAB Server updates the delivery status in the CAB Feature Handler Document for the corresponding request.

### C.4.1.2 Terminating Side

#### C.4.1.2.1 AB forwarding (Accept)

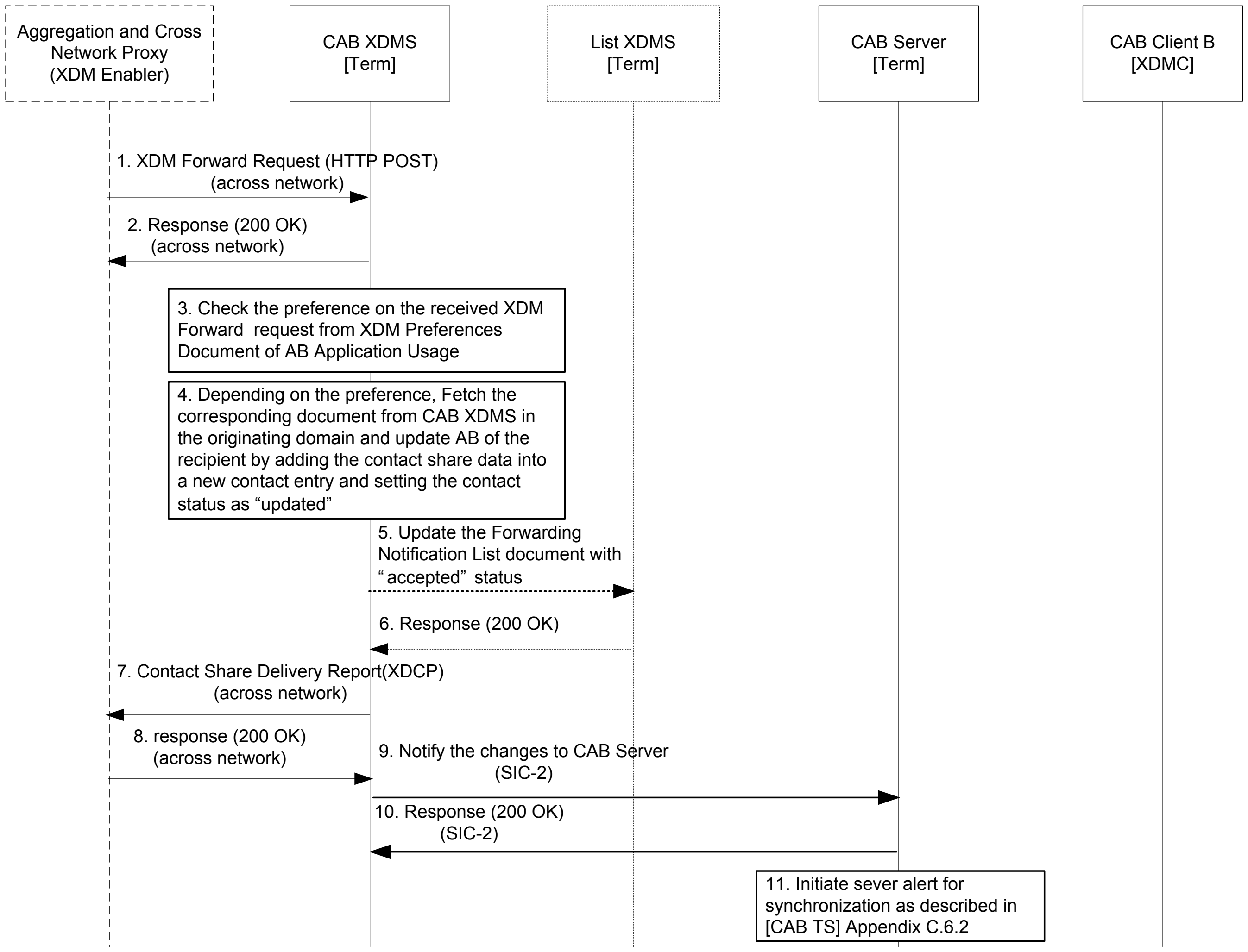

Aggregation and Cross Network Proxy (XDM Enabler)
CAB XDMS [Term]
List XDMS [Term]
CAB Server [Term]
CAB Client B [XDMC]
1. XDM Forward Request (HTTP POST) (across network)
2. Response (200 OK) (across network)
3. Check the preference on the received XDM Forward request from XDM Preferences Document of AB Application Usage
4. Depending on the preference, Fetch the corresponding document from CAB XDMS in the originating domain and update AB of the recipient by adding the contact share data into a new contact entry and setting the contact status as "updated"
5. Update the Forwarding Notification List document with "accepted" status
6. Response (200 OK)
7. Contact Share Delivery Report(XDCP) (across network)
8. response (200 OK) (across network)
9. Notify the changes to CAB Server (SIC-2)
10. Response (200 OK) (SIC-2)
11. Initiate sever alert for synchronization as described in [CAB TS] Appendix C.6.2

**Figure 5: Flows of AB forwarding in the terminating side towards a CAB user**

Step 1: CAB XDMS (AB Application Usage) of CAB Client B receives the Forward XDCP request from the originating network.

Step 2: CAB XDMS (AB Application Usage) of CAB Client B on receiving the remote forward request checks whether the recipients listed in the request are in its domain and then creates the 200 OK response and sends to the CAB XDMS (AB Application Usage) of CAB Client A.

Step 3: CAB XDMS (AB Application Usage) of CAB Client B checks the preferences of the CAB Client B for handling the forward request from the AB forward preferences stored in the AB XDM Preferences Document. Here the case shown is that CAB Client B wants to accept the XDM Resource received from CAB Client A

Step 4: CAB XDMS (AB Application Usage) fetches the XDM Resource using the URI received in the Forward XDCP request and stores the Contact Share data in CAB Client' AB Application Usage and sets the contact status as "updated".

Step 5: CAB XDMS (AB Application Usage) of CAB Client B updates the Forwarding Notification List of CAB Client B for request notification with the details of the received remote forward request

Step 6: The List XDMS of CAB Client B updates the Forwarding Notification List of CAB Client B with the above request notification entry and sends 200 OK response.

Step 7: Since CAB Client A has requested for the Contact Share delivery report, CAB XDMS (AB Application Usage) of CAB Client B generates the Forward Delivery Report request.

Step 8: CAB XDMS (AB Application Usage) of CAB Client B receives 200 OK response with the XDCP Response containing <done> element from the originating network.

Step 9: CAB XDMS (AB Application Usage) of CAB Client B notifies the CAB Server about document changes using SIC-2 interface.

Step 10: The CAB Server sends the response (200 OK) to CAB XDMS (AB Application Usage) using SIC-2 interface.

Step 11: The CAB Server sends an alert to CAB Client B to indicate changes occurred in the CAB User's AB as described in the step 5 of [CAB TS] Appendix C.6.2 "*Address Book Modifications from Network*".

Following this, the CAB Client B may initiate synchronization as described in [CAB TS] Appendix C.6.1"*CAB Client Address Book Modifications and Synchronization*".

### C.4.1.2.2 AB forwarding (Confirm)

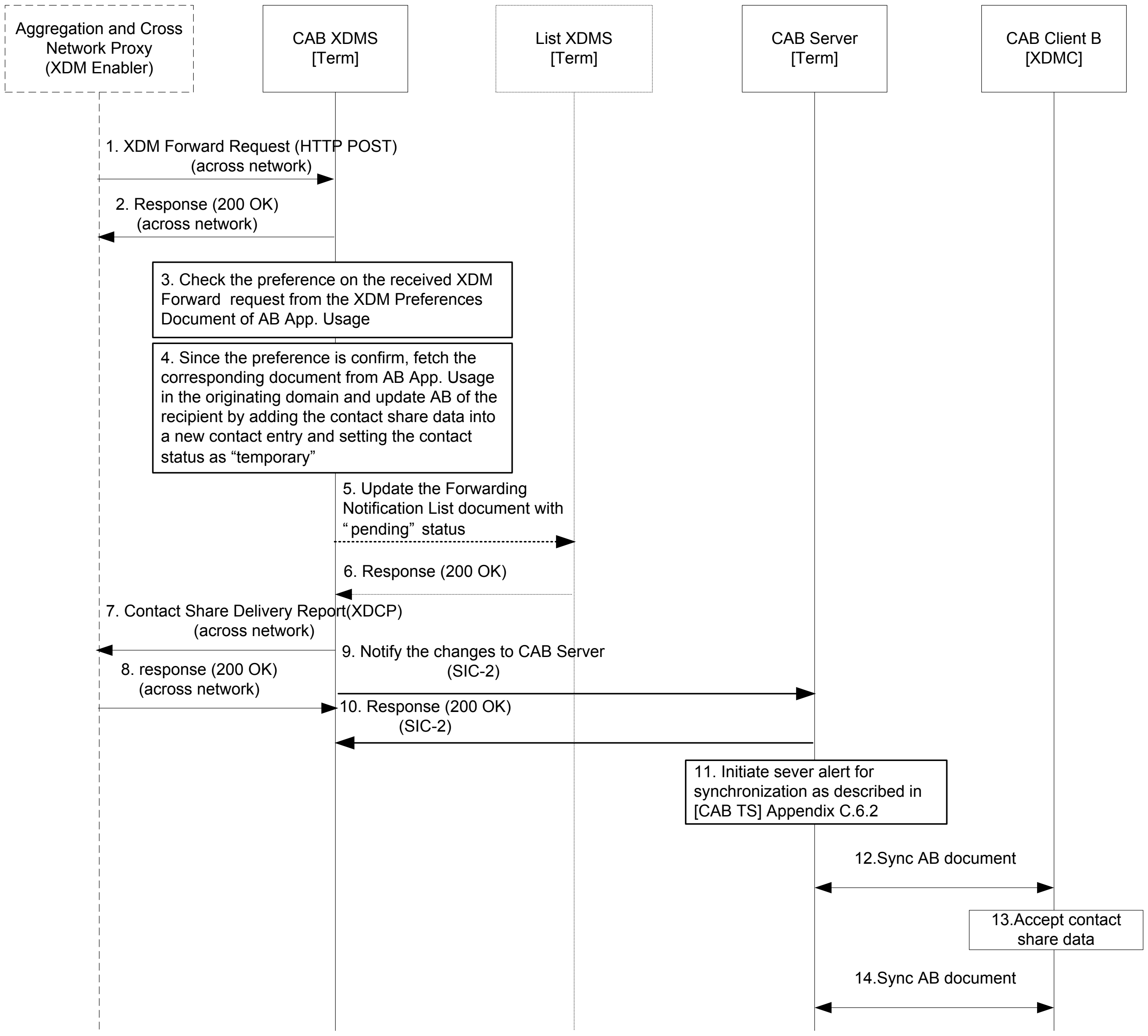

Aggregation and Cross Network Proxy (XDM Enabler)
CAB XDMS [Term]
List XDMS [Term]
CAB Server [Term]
CAB Client B [XDMC]
1. XDM Forward Request (HTTP POST) (across network)
2. Response (200 OK) (across network)
3. Check the preference on the received XDM Forward request from the XDM Preferences Document of AB App. Usage
4. Since the preference is confirm, fetch the corresponding document from AB App. Usage in the originating domain and update AB of the recipient by adding the contact share data into a new contact entry and setting the contact status as "temporary"
5. Update the Forwarding Notification List document with "pending" status
6. Response (200 OK)
7. Contact Share Delivery Report(XDCP) (across network)
8. response (200 OK) (across network)
9. Notify the changes to CAB Server (SIC-2)
10. Response (200 OK) (SIC-2)
11. Initiate sever alert for synchronization as described in [CAB TS] Appendix C.6.2
12.Sync AB document
13.Accept contact share data
14.Sync AB document

**Figure 6: Flows of AB forwarding in the terminating side towards a CAB user**

Step 1: CAB XDMS (AB Application Usage) of CAB Client B receives the Forward XDCP Forward request from the originating network.

Step 2: CAB XDMS (AB Application Usage) of CAB Client B on receiving the remote forward request checks whether the recipients listed in the request are in its domain and then creates the 200 OK response and sends to the CAB XDMS (AB Application Usage) of CAB Client A.

Step 3: CAB XDMS (AB Application Usage) of CAB Client B checks the preferences of the CAB Client B for handling the forward request from the AB forward preferences stored in the AB XDM Preference document. Here the case shown is that CAB Client B wants to confirm the XDM Resource received from CAB Client A

Step 4: CAB XDMS (AB Application Usage) fetches the XDM Resource using the URI received in the Forward XDCP request and stores the Contact Share data in CAB Client B's AB Document and sets the contact status as "temporary".

Step 5: [optional] CAB XDMS (AB Application Usage) of CAB Client B updates the Forwarding Notification List of CAB Client B for request notification with the details of the received remote forward request

Step 6: [optional] The List XDMS of CAB Client B updates the Forwarding Notification List of CAB Client B with the above request notification entry and sends 200 OK response.

Step 7: Since CAB Client A has requested for the Contact Share delivery report CAB XDMS (AB Application Usage) of CAB Client B generates the Forward Delivery Report request.

Step 8: CAB XDMS (AB Application Usage) of CAB Client B receives 200 OK response with the XDCP Response containing <done> element from the originating network.

Step 9: CAB XDMS (AB Application Usage) of CAB Client B notifies the CAB Server about document changes using SIC-2 interface.

Step 10: The CAB Server sends the response (200 OK) to CAB XDMS (AB Application Usage) using SIC-2 interface.

Step 11: The CAB Server sends an alert to CAB Client to indicate changes occurred in the CAB User's AB as described in the step 5 of [CAB TS] Appendix C.6.2 "*Address Book Modifications from Network*".

Step 12: Following this, the CAB Client B may initiate synchronization as described in [CAB TS] Appendix C.6.1 "*CAB Client Address Book Modifications and Synchronization*".

Step 13: CAB Client B accepts the contact share data stored as "temporary" contact in the AB Document and removes <temporary> element in the address book.

Step 14: Following this, the CAB Client B may initiate synchronization as described in [CAB TS] Appendix C.6.1 "*CAB Client Address Book Modifications and Synchronization*".

### C.4.1.2.3 PCC forwarding (Accept)

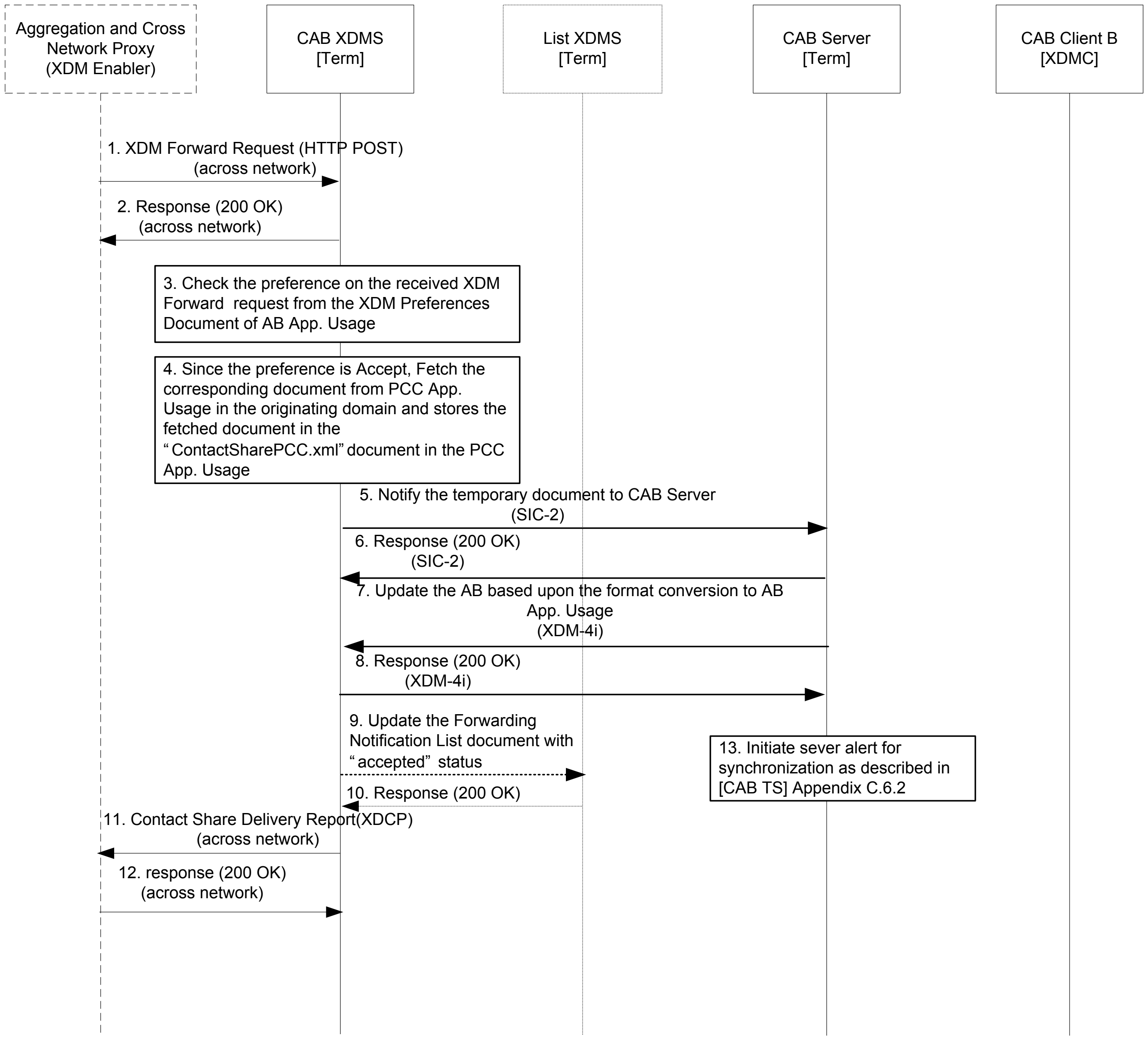

Aggregation and Cross Network Proxy (XDM Enabler)
CAB XDMS [Term]
List XDMS [Term]
CAB Server [Term]
CAB Client B [XDMC]
1. XDM Forward Request (HTTP POST) (across network)
2. Response (200 OK) (across network)
3. Check the preference on the received XDM Forward request from the XDM Preferences Document of AB App. Usage
4. Since the preference is Accept, Fetch the corresponding document from PCC App. Usage in the originating domain and stores the fetched document in the "ContactSharePCC.xml" document in the PCC App. Usage
5. Notify the temporary document to CAB Server (SIC-2)
6. Response (200 OK) (SIC-2)
7. Update the AB based upon the format conversion to AB App. Usage (XDM-4i)
8. Response (200 OK) (XDM-4i)
9. Update the Forwarding Notification List document with "accepted" status
10. Response (200 OK)
11. Contact Share Delivery Report(XDCP) (across network)
12. response (200 OK) (across network)
13. Initiate sever alert for synchronization as described in [CAB TS] Appendix C.6.2

**Figure 7: Flows of PCC forwarding in the terminating side towards a CAB user**

Step 1: CAB XDMS (PCC Application Usage) of CAB Client B receives the Forward XDCP request from the originating network.

Step 2: CAB XDMS (PCC Application Usage) of CAB Client B on receiving the remote forward request checks whether the recipients listed in the request are in its domain and then creates the 200 OK response and sends to the CAB XDMS (PCC Application Usage) of CAB Client A.

Step 3: CAB XDMS (PCC Application Usage) of CAB Client B checks the preferences of the CAB Client B for handling the forward request from the AB forward preferences stored in the AB XDM Preferences Document. Here the case shown is that CAB Client B wants to accept the XDM Resource received from CAB Client A

Step 4: CAB XDMS (PCC Application Usage) fetches the XDM Resource using the URI received in the Forward XDCP request and stores the fetched content in the ContactSharePCC.xml document in the PCC Application Usage.

Step 5: The CAB Server gets notified of the changes to the ContactSharePCC.xml document from CAB XDMS (PCC Application Usage)

Step 6: The CAB Server sends the response (200 OK) to CAB XDMS (PCC Application Usage) using SIC-2 interface.

Step 7: The CAB Server updates the AB Document with the content of received contact share data residing in the ContactSharePCC.xml document after performing the needed format conversion and sets the contact status as "updated".

Step 8: The CAB XDMS (AB Application Usage) sends the response (200 OK) to CAB Server.

Step 9: [Optional] CAB XDMS (PCC Application Usage) of CAB Client B updates the Forwarding Notification List of CAB Client B for request notification with the details of the received remote forward request

Step 10: [Optional] The List XDMS of CAB Client B updates the Forwarding Notification List of CAB Client B with the above request notification entry and sends 200 OK response.

Step 11: Since CAB Client A has requested for the Contact Share delivery report CAB XDMS (PCC Application Usage) of CAB Client B generates the Forward Delivery Report request.

Step 12: CAB XDMS (PCC Application Usage) of CAB client B receives 200 OK response with the XDCP Response containing <done> element from the originating network.

Step 13: The CAB Server sends an alert to CAB Client B to indicate changes occurred in the CAB User's AB as described in the step 5 of [CAB TS] Appendix C.6.2 "*Address Book Modifications from Network*".

Following this, the CAB Client B may initiate synchronization as described in [CAB TS] Appendix C.6.1 "*CAB Client Address Book Modifications and Synchronization*".

## C.4.1.2.4 PCC forwarding (Confirm)

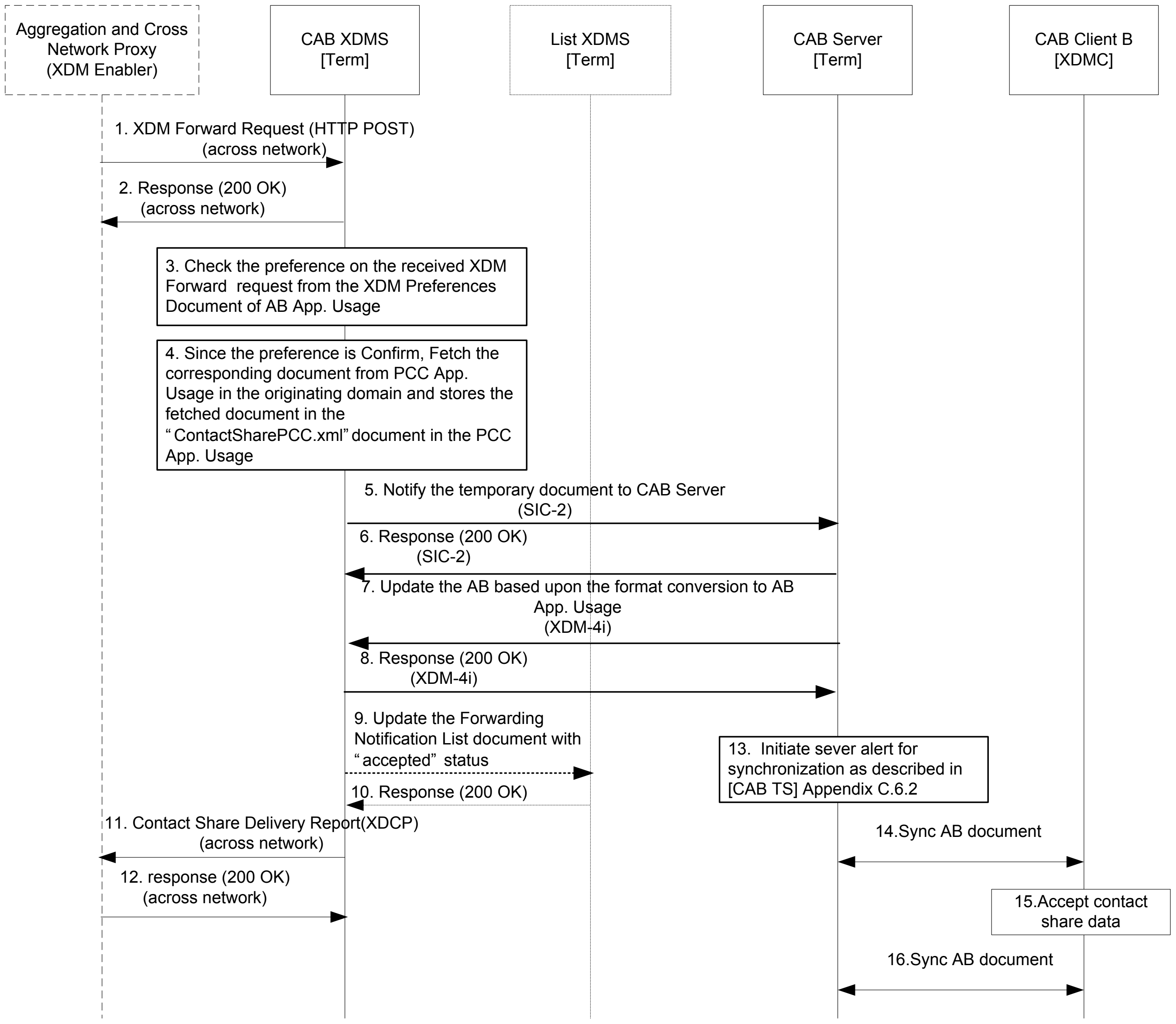

Aggregation and Cross Network Proxy (XDM Enabler)
CAB XDMS [Term]
List XDMS [Term]
CAB Server [Term]
CAB Client B [XDMC]
1. XDM Forward Request (HTTP POST) (across network)
2. Response (200 OK) (across network)
3. Check the preference on the received XDM Forward request from the XDM Preferences Document of AB App. Usage
4. Since the preference is Confirm, Fetch the corresponding document from PCC App. Usage in the originating domain and stores the fetched document in the "ContactSharePCC.xml" document in the PCC App. Usage
5. Notify the temporary document to CAB Server (SIC-2)
6. Response (200 OK) (SIC-2)
7. Update the AB based upon the format conversion to AB App. Usage (XDM-4i)
8. Response (200 OK) (XDM-4i)
9. Update the Forwarding Notification List document with "accepted" status
10. Response (200 OK)
11. Contact Share Delivery Report(XDCP) (across network)
12. response (200 OK) (across network)
13. Initiate sever alert for synchronization as described in [CAB TS] Appendix C.6.2
14.Sync AB document
15.Accept contact share data
16.Sync AB document

**Figure 8: Flows of PCC forwarding in the terminating side towards a CAB user**

Step 1: CAB XDMS (PCC Application Usage) of CAB Client B receives the Forward XDCP request from the originating network.

Step 2: CAB XDMS (PCC Application Usage) of CAB Client B on receiving the remote forward request checks whether the recipients listed in the request are in its domain and then creates the 200 OK response and sends to the CAB XDMS (PCC Application Usage) of CAB Client A.

Step 3: CAB XDMS (PCC Application Usage) of CAB Client B checks the preferences of the CAB Client B for handling the forward request from the AB forward preferences stored in the AB XDM Preferences Document. Here the case shown is that CAB Client B wants to accept the XDM Resource received from CAB Client A

Step 4: CAB XDMS (PCC Application Usage) fetches the XDM Resource using the URI received in the Forward Remote request and creates the fetched content in the ContactSharePCC.xml document as the temporary document in the PCC Application Usage.

Step 5: The CAB Server gets notified of the temporary document from CAB XDMS (PCC Application Usage)

Step 6: The CAB Server sends the response (200 OK) to CAB XDMS (PCC Application Usage) using SIC-2 interface.

Step 7: The CAB Server updates the AB Document with the content of received contact share data residing in the ContactSharePCC.xml document after performing the needed format conversion and sets the contact status as “temporary”.

Step 8: The CAB XDMS (AB Application Usage) sends the response (200 OK) to CAB Server.

Step 9: [Optional] CAB XDMS (PCC Application Usage) of CAB Client B updates the Forwarding Notification List of CAB Client B for request notification with the details of the received remote forward request

Step 10: [Optional] The List XDMS of CAB Client B updates the Forwarding Notification List of CAB Client B with the above request notification entry and sends 200 OK response.

Step 11: Since CAB Client A has requested for the Contact Share delivery report CAB XDMS (PCC Application Usage) of CAB Client B generates the Forward Delivery Report request.

Step 12: CAB XDMS (PCC Application Usage) of CAB client B receives 200 OK response with the XDCP Response containing <done> element from the originating network.

Step 13: The CAB Server sends an alert to CAB Client to indicate changes occurred in the CAB User’s AB as described in the step 5 of [CAB TS] Appendix C.6.2

Step 14: Following this, the CAB Client B may initiate synchronization as described in [CAB TS] Appendix C.6.1 “*CAB Client Address Book Modifications and Synchronization*”.

Step 15: CAB Client B accepts the contact share data stored as “temporary” contact in the address book and removes <temporary>element for the confirmed contact..

Step 16: Following this, the CAB Client B may initiate synchronization as described in [CAB TS] Appendix C.6.1. “*CAB Client Address Book Modifications and Synchronization*”

## C.4.2 Contact Share towards a Non CAB User

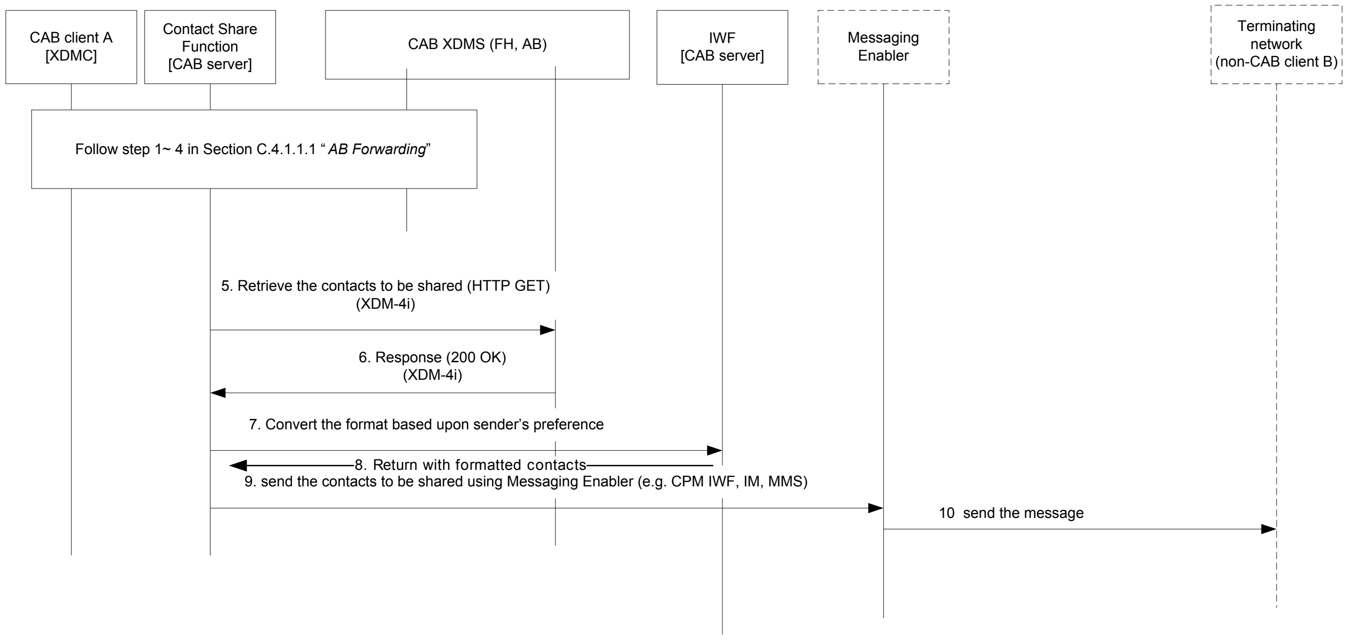

CAB client A [XDMC]
Contact Share Function [CAB server]
CAB XDMS (FH, AB)
IWF [CAB server]
Messaging Enabler
Terminating network (non-CAB client B)
Follow step 1~ 4 in Section C.4.1.1.1 “AB Forwarding”
5. Retrieve the contacts to be shared (HTTP GET) (XDM-4i)
6. Response (200 OK) (XDM-4i)
7. Convert the format based upon sender’s preference
8. Return with formatted contacts
9. send the contacts to be shared using Messaging Enabler (e.g. CPM IWF, IM, MMS)
10 send the message

**Figure 9 : Flows of Contact Share towards a non CAB user**

Steps 1 through 4 are same as the flow in section C.4.1.1.1 "*AB Forwarding*"

Step 5: Contact Share Function uses the CAB Server's XDM Agent to perform a HTTP GET using XDM-4i to retrieve the contact(s) to be shared from AB application usage of the CAB XDMS

Step 6: Contact Share Function receives the success response (200 OK) from CAB XDMS.

Step 7: Contact Share Function may request internally to CAB IWF to convert the format of the contact(s) to be shared following section 5.4.3 "*Format Adaptation*".

Step 8: The CAB IWF returns with the formatted contact(s)

Step 9: Upon successfully obtaining the data format to be sent to the recipient(s), Contact Share Function sends the contacts to be shared using a Messaging Enabler, e.g. CPM ISF through its exposed interface.

Step 10: Messaging Enabler sends the message that contains the shared contacts to the recipient(s). The delivery and responses depend on each of the messaging means employed and it is out of scope of this specification.

## C.5 Contact Subscription flows

### C.5.1 CAB Server Subscribes to contacts PCCs using Subscription Proxy

This flow is triggered by the updates in the CAB User's subscription list in the CAB User Preferences Application Usage, such as deleting, adding new contacts or modifying existing contacts uris that are used in the subscription process.

This example flow uses the case of addition of multiple users into the CAB User A's subscription list: CAB User B and CAB user C to be subscribed to. The management of subscription list in the CAB User Preferences Application Usage follows the same flow as described in the Appendix C.3 "*Sample XCAP flows for management of CAB XML documents*".

Note: The 200 OK responses and ACK are not shown in the figure and steps for simplification.

Note: The SIP/IP Core between different networks is not shown for simplification.

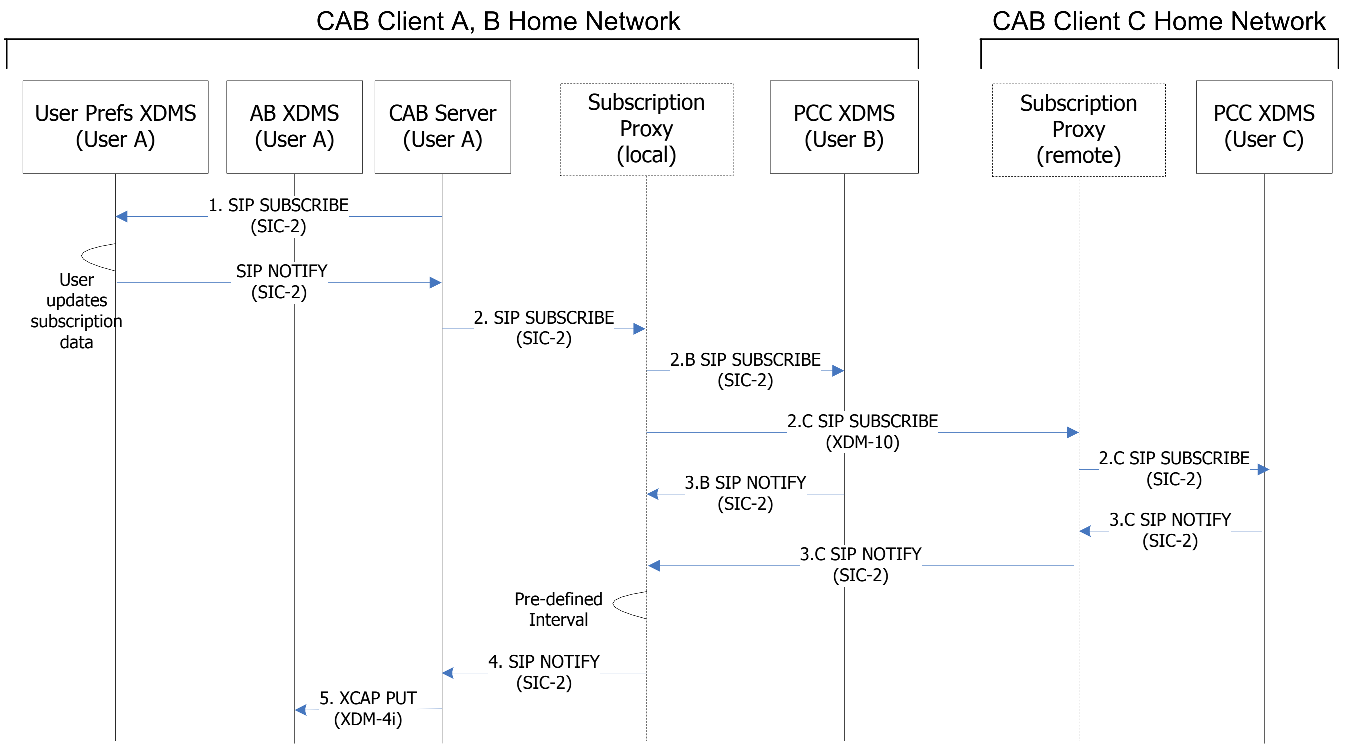


**Figure 10 : Contact Subscription flow using the Subscription Proxy**

Step 1: Following the subscription of the CAB Server of CAB User A through the interface SIC-2 to the updates of the subscription list in the CAB User Preferences Application Usage, the Contact Subscription Function of the CAB Server of the CAB User A gets notified of changes.

Note: This trigger can also be achieved through regular polling of CAB User Preferences Document by the CAB Server. The Contact Subscription status is set to "pending" for both contacts B and C in the Contact Status of the CAB User A's AB Application Usage.

Step 2: The Contact Subscription Function of the CAB Server of the CAB user A sends a SIP SUBSCRIBE request to the Subscription Proxy via the SIP/IP Core using the xcap-diff event package following the rules and procedures described in section 6.1.2 "*Subscribing to Changes in the XDM Resources*" of [OMA XDM Core]. The Request URI of the SIP SUBSCRIBE request is set to the SIP address of the Subscription Proxy as obtained during provisioning. The body of the SIP SUBSCRIBE request contains the resource list with three entries as specified in [OMA XDM Core]:

- AUID “org.openmobilealliance.cab-pcc”
- URI pointing to PCC of user B: “userB@example.com”
- URI pointing to PCC of user C: “userC@other_domain.com”

.

Upon receiving a SIP SUBSCRIBE request for the “xcap-diff” event package, the Subscription Proxy creates a subscription dialog to "xcap-diff" event package to provide the changes of the data identified by the body of SIP SUBSCRIBE request, and return 200 OK response to the CAB Server through the SIP/IP Core

Step 2.B: Based on the received initial subscription, the Subscription Proxy generates SIP SUBSCRIBE request for back-end subscriptions through the SIP/IP Core for each of the users listed in the body. The Subscription Proxy sets the Request URI to the value “sip:userB@example.com;auid=org.openmobilealliance.cab-pcc” and sends the SIP SUBSCRIBE request to the PCC Application Usage of CAB User B.

Upon receiving the SIP SUBSCRIBE request the PCC Application Usage of the CAB User B verifies the Access Permissions regarding the CAB User A. Assuming the CAB User A is successfully authorized, the PCC Application Usage of User B responds with 200 OK response through the SIP/IP Core to the CAB Server.

The received SIP SUBSCRIBE request is stored in the Request History Information Document of PCC Application Usage, subject to history preferences defined in XDM Preferences Document, following the rules defined in section 5.7.2 “*Request History Information Document*” of [OMA XDM Core]. Contact Status Function of the CAB Server may use the Request History Document of PCC Application Usage, subject to CAB User preferences, as described in section 5.8.3 “*Incoming Contact Subscription Requests*”.

Step 2.C: The SIP SUBSCRIBE request is sent to the PCC Application Usageof the CAB User C in the remote network via the SIP/IP Core, and possibly via Subscription Proxy in the remote network.

Upon receiving the SIP SUBSCRIBE request with the Request URI set to “sip:userC@other_domain.com;auid=org.openmobilealliance.cab-pcc”, the PCC Application Usage of the CAB User C verifies Access Permissions regarding the CAB User A. Assuming the CAB User A is successfully authorized, the PCC Application Usage of the CAB User C responds with 200 OK response following the same path back to the CAB Server.

The received SIP SUBSCRIBE request is stored in the Request History Information Document of PCC Application Usage, subject to history preferences defined in XDM Preferences Document, following the rules defined in section 5.7.2 “*Request History Information Document*” of [OMA XDM Core]. Contact Status Function of the CAB Server may use the Request History Document of PCC Application Usage, subject to CAB User preferences, as described in section 5.8.3 “*Incoming Contact Subscription Requests*”.

Step 3.B: The PCC Application Usage of the CAB User B generates and sends an initial SIP NOTIFY request via the same path as the corresponding SIP SUBSCRIBE request containing the initial reference to the XDM Document listed in the body of SIP SUBSCRIBE request, i.e. the PCC Document of the CAB User B. The SIP NOTIFY is received by the Subscription Proxy in Home domain of CAB User A, which will respond with 200 OK response all the way to the PCC Application Usage.

Step 3.C: The PCC Application Usage of the CAB User C generates and sends the initial SIP NOTIFY request via the same path as the corresponding SIP SUBSCRIBE request, containing initial reference to XDM Document listed in the body of SIP SUBSCRIBE request, i.e. the PCC Document of the CAB User C. The SIP NOTIFY is received by the Subscription Proxy in Home domain of CAB User A, which will respond with 200 OK response all the way to the PCC Application Usage.

Step 4: In this example, it is assumed that initial notifications from PCC Application Usage(s) in the same domain are received without any significant delay. The Subscription Proxy, after the predefined interval, generates and sends the initial notification to the Contact Subscription Function of the CAB server of CAB User A.

Until this state, the initial notifications from the PCC Application Usage(s) in the same network and remote network were received. The Contact Subscription Function of the CAB server A will respond all the way back with 200 OK response.

Step 5: The Contact Subscription Function of the CAB Server A receives the SIP NOTIFY request with the states of the subscriptions for the CAB User B and the CAB User C and updates the Contact Status of the Contact Entries corresponding to the CAB User B and CAB User C in the AB Application Usage of the CAB User A based upon the user preference of the

CAB User A. The updates in Contact Status of the contacts B and C consists in the subscription status data (in this case “active”).

The update of Contact Status in AB Application Usage gets notified to the CAB Server A and the CAB Server A sends an alert to the CAB User A to indicate changes occurred in the CAB User A’s AB Application Usage as described in step 5 of [CAB TS] Appendix C.6.2 “*Address Book Modifications from Network*”. Following this, the CAB Client A may initiate synchronization as described in [CAB TS] Appendix C.6.1 “*CAB Client Address Book Modifications and Synchronization*”.

### C.5.2 CAB Client Subscribes to contact’s PCC through the reactive authorization

The CAB Client triggers the Contact Subscription to contacts PCC by the updates in the CAB User’s subscription list in the CAB User Preferences Application Usage.

This example flow describes the CAB User A’s Contact Subscription to CAB User B through the reactive authorization.

For the activation of the reactive authorization for CAB User A, CAB User B needs to update the XDM Preferences Document for the PCC Application Usages in such away that the Request History Information Documents for the PCC Application Usage are updated with information about unsuccessful XDM Requests using procedures in section 6.1.1.2 of [OMA XDM Core]. And the CAB Server of CAB User B also needs to subscribe for changes to the Request History Information Documents as described in [OMA XDM Core] Appendix G. “*Reactive Authorization of XDM Requests using Request History Information Documents*”.

Note: The 200 OK responses and ACK are not shown in the figure and steps for simplification.

Note: The SIP/IP Core or Subscription Proxy between different networks is not shown for simplification.

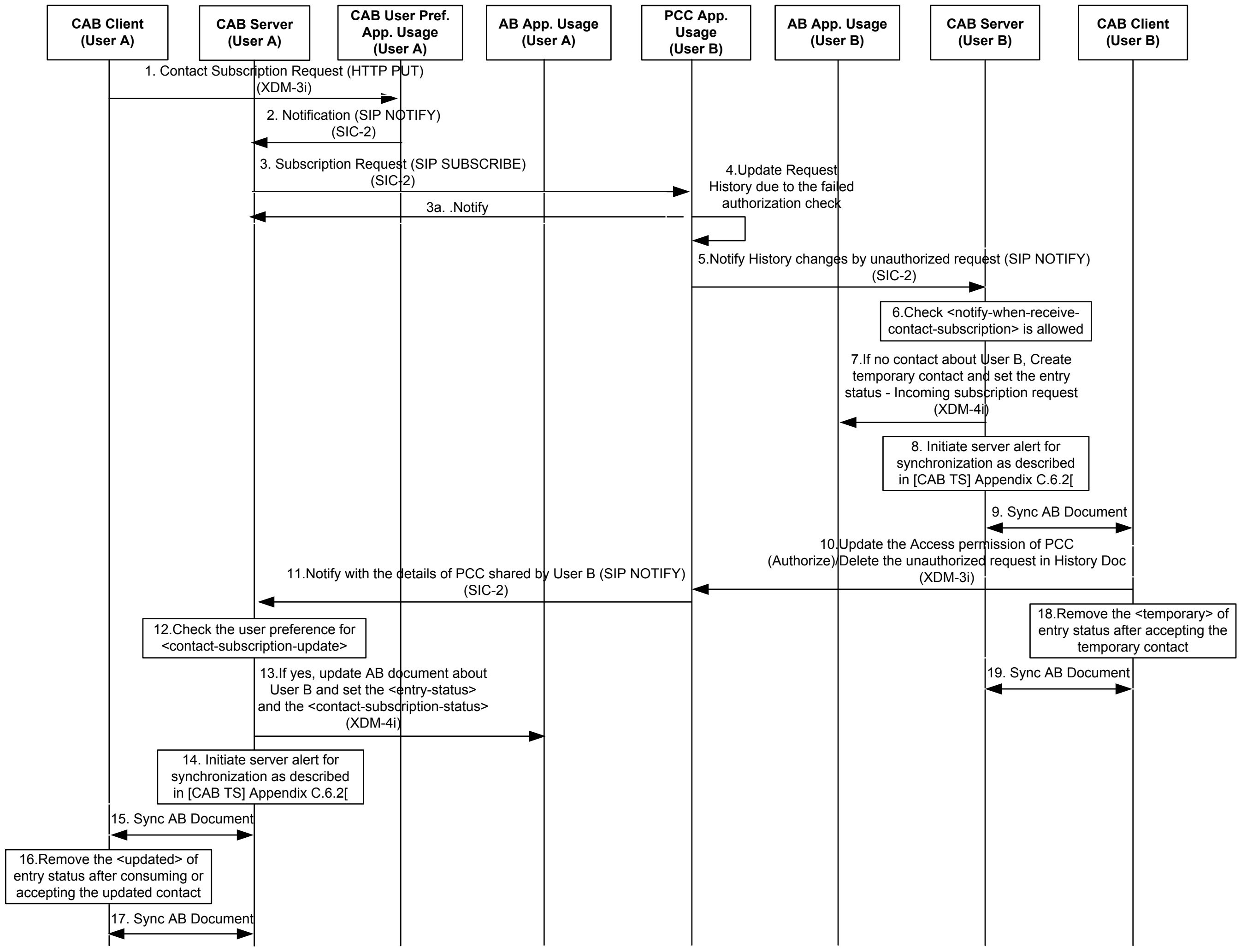

CAB Client (User A)
CAB Server (User A)
CAB User Pref. App. Usage (User A)
AB App. Usage (User A)
PCC App. Usage (User B)
AB App. Usage (User B)
CAB Server (User B)
CAB Client (User B)
1. Contact Subscription Request (HTTP PUT) (XDM-3i)
2. Notification (SIP NOTIFY) (SIC-2)
3. Subscription Request (SIP SUBSCRIBE) (SIC-2)
3a. .Notify
4.Update Request History due to the failed authorization check
5.Notify History changes by unauthorized request (SIP NOTIFY) (SIC-2)
6.Check <notify-when-receive-contact-subscription> is allowed
7.If no contact about User B, Create temporary contact and set the entry status - Incoming subscription request (XDM-4i)
8. Initiate server alert for synchronization as described in [CAB TS] Appendix C.6.2[
9. Sync AB Document
10.Update the Access permission of PCC (Authorize)/Delete the unauthorized request in History Doc (XDM-3i)
11.Notify with the details of PCC shared by User B (SIP NOTIFY) (SIC-2)
12.Check the user preference for <contact-subscription-update>
18.Remove the <temporary> of entry status after accepting the temporary contact
13.If yes, update AB document about User B and set the <entry-status> and the <contact-subscription-status> (XDM-4i)
19. Sync AB Document
14. Initiate server alert for synchronization as described in [CAB TS] Appendix C.6.2[
15. Sync AB Document
16.Remove the <updated> of entry status after consuming or accepting the updated contact
17. Sync AB Document

**Figure 11 : Contact Subscription flow through the reactive authorization**

Step 1: CAB Client A performs a HTTP PUT containing Contact Subscription data in CAB User Preferences Document in the CAB XDMS, using XDM-3i interface

Step 2: CAB User Preferences Application Usage of CAB XDMS notifies Contact Subscription Function (through the CAB Server's XDM Agent) about document changes using SIC-2 interface.

Note: alternatively, the CAB Server can poll via XDM-4i the CAB User Preferences Document and perform the steps below after detecting a change in the data.

Step 3: The Contact Subscription Function of CAB Server of the CAB User A sends a SIP SUBSCRIBE request towards the PCC Application Usage of CAB User B via the Subscription Proxy/SIP/IP Core as described in [CAB TS] Appendix C.5.1 "*CAB Server Subscribes to contacts PCCs using Subscription Proxy*".

Step 4: The Request History Information Document of the PCC Application Usage of CAB User B according to XDM Preferences Document set by the CAB User B is updated with the information about unsuccessful XDM operations.

Step 5: The CAB Server of CAB User B receives the notification from the CAB XDMS (PCC Application Usage).

Note: alternatively, the CAB Server can poll via XDM-4i the Request History Information Document and perform the steps below after detecting a change in the data.

Step 6: The CAB Server of CAB User B checks the preferences of the CAB User B for indicating whether to notify the CAB User for incoming Contact Subscription request.

Step 7: The CAB Server of CAB User B creates the temporary contact and set the <updated> element of entry status as “incoming subscription request”.

Step 8: The CAB Server of CAB User B sends an alert to CAB Client of CAB User B to indicate changes occurred in the CAB User’s AB Document as described in the step 5 of [CAB TS] Appendix C.6.2.

Step 9: The CAB Client of CAB User B may initiate synchronization as described in [CAB TS] Appendix C.6.1.

Step 10: The CAB User B checks if the synchronized AB Document contains the entry status for old unauthorized XDM requests. If that is the case, the CAB User B’s UE prompts the User with the list of unauthorized old XDM requests and asks what to do with them and continues the possible choices per the entry status as described in [OMA XDM Core] Appendix G. “*Reactive Authorization of XDM Requests using Request History Information Documents*”. If it contains a new unauthenticated XDM Request, the CAB User B’s UE prompts as described in [OMA XDM Core] Appendix G. “*Reactive Authorization of XDM Requests using Request History Information Documents*” but with only one XDM request.

In this example flow, the CAB User B selects to authorize the CAB User A. Thus, CAB Client of CAB User B updates the Access Permissions Document related to the PCC Application Usage of CAB User B by using procedure described on specified in [OMA XDM Core] section 6.1.1.2.4 to grant the CAB User A’s access to the requested XDM Document. The CAB Client of CAB User B also uses procedures described in [OMA XDM Core] section 6.1.1.2.5 to delete the part in the Request History Document that contained request information about the now authorized user. This is done because the CAB User B needs to make sure that the user is not prompted again with old unauthorized requests from e.g. other UEs that the user might have.

Step 11: The CAB Server of CAB User A gets notified of the details of PCC Document shared by the CAB User B, following the change in authorization for CAB User A’s subscription (initiated in Step 3).

Note: If the subscription expires before the authorization change occurs, the SIP SUBSCRIBE will need to be either refreshed to extend the expiry or re-initiated.

Step 12: The CAB Server of CAB User A checks the preferences of the CAB User A for indicating whether the AB Application Usage of CAB User A is updated automatically when information resulting from Contact Subscription is received

Step 13: The CAB Server of CAB User A updates AB Document about CAB User B and set the <updated> element of entry status as “contact subscription request” and the <contact-subscription-status> as “active”.

Step 14: The CAB Server of CAB User A sends an alert to CAB Client of CAB User A to indicate changes occurred in the CAB User’s AB Document as described in the step 5 of [CAB TS] Appendix C.6.2.

Step 15: The CAB Client of CAB User A may initiate synchronization as described in [CAB TS] Appendix C.6.1.

Step 16: The CAB User A removes the <updated> element of <entry-status> element after consuming the updated contact.

Step 17: The CAB Client of CAB User A may initiate synchronization as described in [CAB TS] Appendix C.6.1.

Step 18: The CAB User B removes the <temporary> element of <entry-status> element after accepting the updated contact.

Step 19: The CAB Client of CAB User B may initiate synchronization as described in [CAB TS] Appendix C.6.1.

## C.6 Managing Address Book Flow

### C.6.1 CAB Client Address Book Modifications and Synchronization

Figure 12 depicts a CAB Client originated address book modifications and synchronization flow. The flow assumes that the CAB Server and CAB Client had up-to-date copies of the network-based address book, prior to the CAB Client making modifications to the address book. For illustrative purposes, a two-way DS synchronization with initialization separate from data sync is shown.

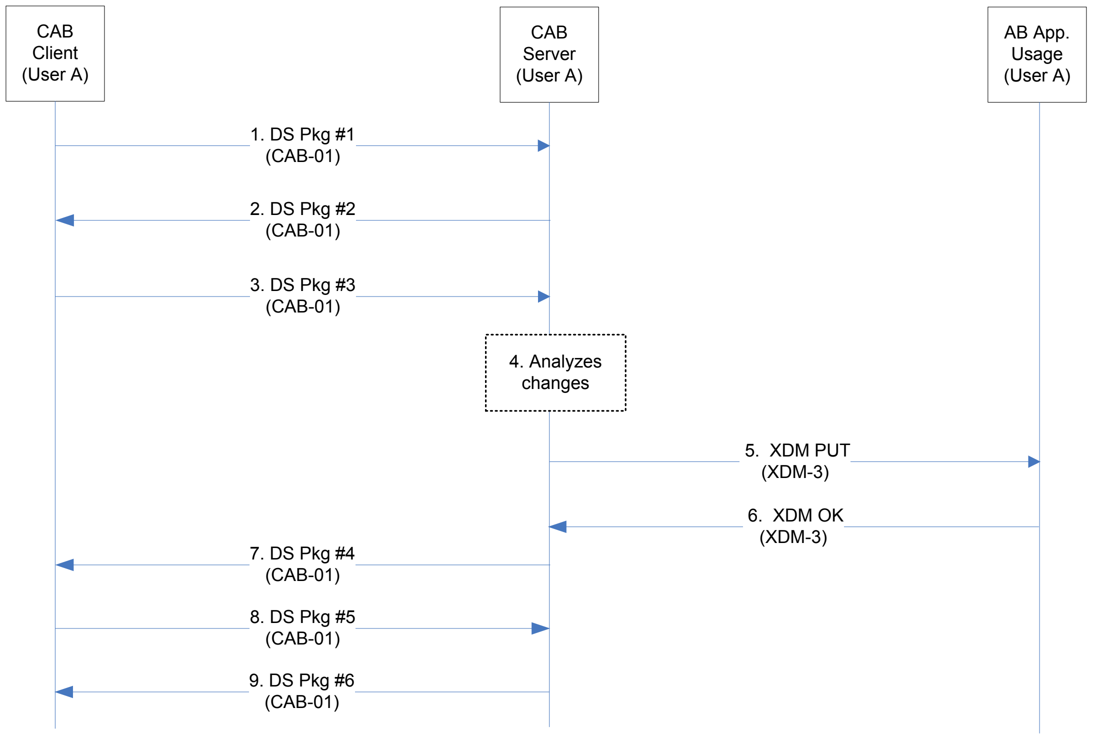


**Figure 12 : CAB Client Address Book Modifications and Synchronization Flow**

1. Based on modifications on the CAB User's client address book, the CAB Client sends an OMA DS initialization message (OMA DS Pkg #1) to the CAB Server. The message includes server challenge (if needed), device capability information, DS sync type, and data type (i.e., the user's Address Book) to be synchronized with associated anchors.
2. The CAB Server computes the authentication challenge response, if a challenge was included, and then sends a DS message (OMA DS Pkg #2) to the CAB client that includes the challenge response to the CAB Client, if the CAB Client had challenged the CAB Server, a client challenge, server capability information, sync type, and synchronization information including associated anchors.
3. The CAB Client computes the challenge response for the CAB Server, and sends a DS message (OMA DS Pkg #3) with proposed address book modifications to the CAB Server.
4. The CAB Server processes address book modifications from the CAB Client.
5. The CAB Server updates the AB Application Usage. This may involves multiple XDM requests, but only one request is depicted in the figure.
6. The AB Application Usage acknowledges the write operation. There is one XDM response for each XDM request in the previous step.

7. The CAB Server sends a DS message (OMA DS Pkg #4) with a status for the client modifications and server modifications to the client.
8. The CAB Client updates its local address book cache, and sends a DS status message to the server (OMA DS Pkg #5).
9. The CAB Server sends an DS message (OMA DS Pkg #6) with the map acknowledgement to the CAB Client.

Note: Depending on the DS packages implementation, Steps 5 and 6 may occur at different times during OMA DS synchronization procedure. If there is data resulting from Step 4 that needs to be written into AB Application Usage, this has to be done prior to closing the procedure of OMA DS synchronization (i.e. Step 9 or Step 7) to avoid data inconsistency in case of further reads of AB data.

## C.6.2 Address Book Modifications from Network

Figure 13 depicts a network originated address book modifications flow e.g. when there is a change to the user address book that occurred in the network. The flow assumes that the local and network address books were up-to-date prior to the network modifications.

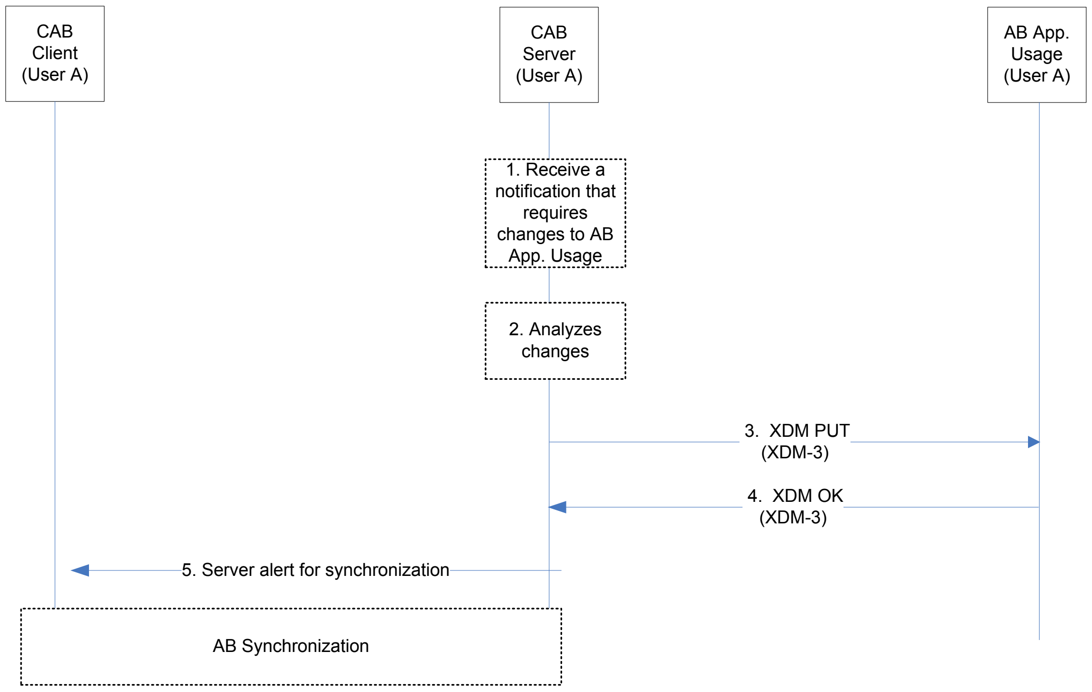


**Figure 13 : Address Book Modifications from Network**

1. The CAB Server receives a notification that may require a change to the user's AB in the network (e.g., receives a SIP NOTIFY request from an XDM Subscription Proxy or PCC Application Usage of the Published Contact Card, based on an active subscription, change from multiple devices).
2. The CAB Server analyzes the changes found in the notifications.

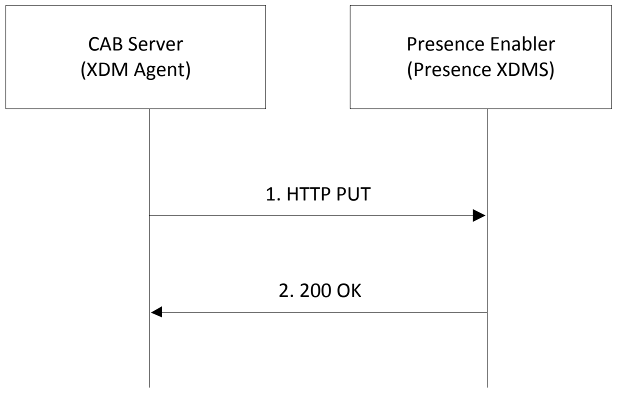
3. The CAB Server updates the AB Application Usage.
4. The AB Application Usage applies access permission rules, updates AB Document, and acknowledges the update.
5. The CAB Server sends an alert to CAB Client to indicate changes occurred in the CAB User's network address book.

Following this, the CAB Client may initiate synchronization as described in C6.1. "*CAB Client Address Book Modifications and Synchronization*".

## C.7 CAB Capability Flows

The following provides three basic message flows for exchange of CAB capability information based on the Presence Enabler. The first two flows are different alternatives for the same functionality, namely the publication of the CAB Capability.

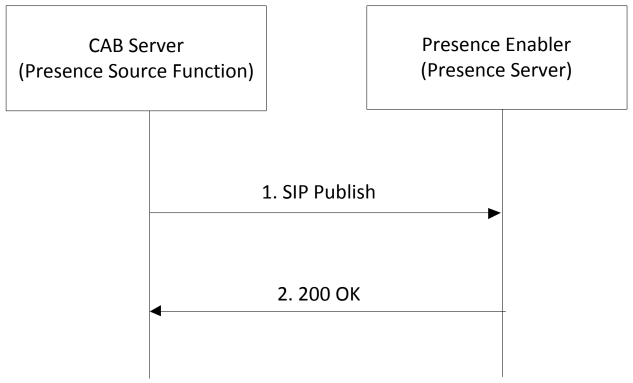
### C.7.1 CAB Server publishes CAB capability as Permanent Presence State



Step 1: A user becomes CAB user. The CAB Server through the XDM Agent updates the CAB capability of the new CAB User at that user's Permanent Presence State at the Presence Enabler (Presence XDMS).

Step 2: The response is sent back to the CAB Server.

### C.7.2 CAB Server publishes CAB capability as a regular SIP Publish

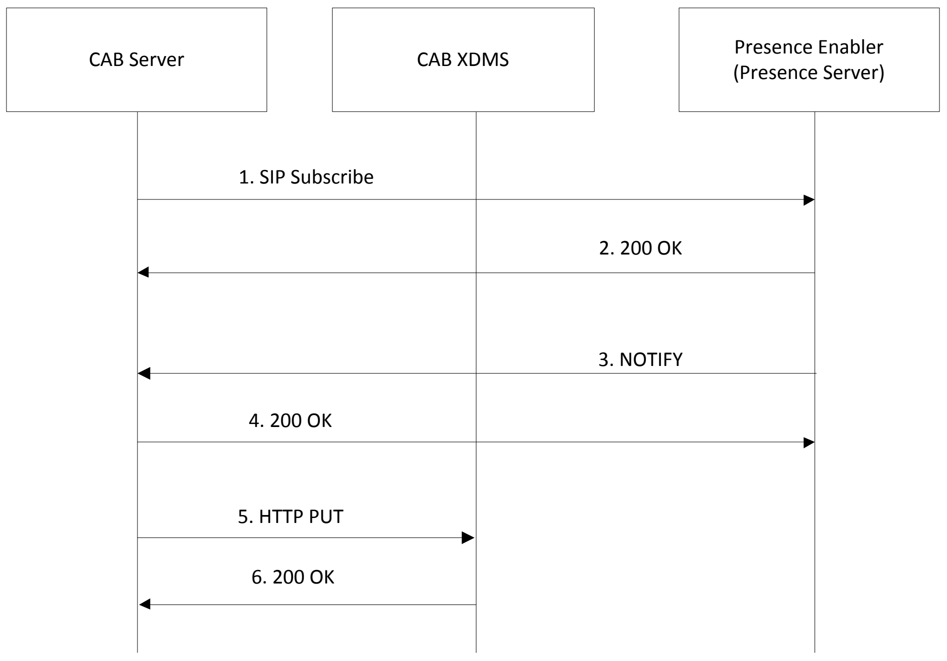


Step 1: A user becomes CAB user. The CAB Server through the Presence Source Function publishes the CAB capability of the new CAB User to that user's Presence Document at the Presence Enabler (Presence Server).

Step 2: The response is sent back to the CAB Server.

These requests are exchanged through the SIP/IP Core, which is not shown for simplicity

## C.7.3 CAB Server subscribes to CAB Capability of its user's contacts



Step 1: CAB server (Presence Watcher Function) subscribes to the Presence (CAB service tuple) of the contacts in the address book of each user it serves. This can be also incremental subscriptions (e.g. when a user adds a new contact). The subscription is performed by either of the following procedures:

Step 1a: individual subscriptions to each of the contacts in the address book of each of the users (with multiple subscriptions to a specific contact if included in the address books of more than one user)

Step 1b: single anonymous subscription for each contact included in at least one address book of the users served by that CAB server.

Step 2: The response is sent back to the CAB Server.

Step 3: A notification is received from the Presence Enabler, informing of a change in the CAB Service tuple of subscribed contact. Multiple notifications for a single contact may be received if Step 1a was followed

Step 4: The response is sent back to the Presence Enabler.

Step 5: The CAB server (XDM Agent) updates the CAB XDMS, by updating the "contact type" (CAB/non-CAB) of the corresponding contact in the address book of the user with that specific contact in his/her address book, and subject to the information received in the notifications in Step 3 (e.g. if Step 1a was followed no update will be performed in those users' address book for which no notification was received, meaning the contact did not grant access to his/her Presence data).

Step 6: The response is sent back to the CAB Server.

The SIP requests (steps 1, 2, 3 and 4) are exchanged through the SIP/IP Core, which is not shown for simplicity

## Appendix D. X-CAB parameters and fields definitions (Informative)

This annex defines some informative vCard extensions (i.e. X-CAB based) that can be helpful to be used when format adaptation between CAB Format with Legacy Format is performed.

Note: The following table includes extensions for some of the CAB format elements, but it is not exhaustive.

| CAB attributes | Initial vCard parameter | vCard extensions (parameters) |
|---|---|---|
| "pcc-type" | ▨ | Used as a property not as a parameter (see 2nd table below) |
| "contactIdRef" | ▨ | X-CAB-CONTACT-ID-REF (used in X-CAB-CONTACT-STATUS to indicate, when temporary element is used, a reference to the Contact Entry to which the contact activity-status is associated with) |
| "index" | ▨ | X-CAB-INDEX (possible values : token) |
| "language-proficiency-type" | ▨ | X-CAB-LANGUAGE-PROFICIENCY-TYPE (possible values : "read only", "speak", "read/write") |
| "language-fluency-type" | ▨ | X-CAB-LANGUAGE-FLUENCY-TYPE (possible values : "beginner", "average", "fluent") |
| "q-level" | ▨ | "X-CAB-LEVEL" (possible values : "beginner", "average", "expert") |
| "h-level" | ▨ | "X-CAB-LEVEL" (possible values : "high", "medium", "low") |
| "i-level" | ▨ | "X-CAB-LEVEL" (possible values : "high", "medium", "low") |
| "org-name-type" | "TYPE" | as in last vCard specification with specific values (possible values : "LegalName", "FormerName", OfficialName") |

| PCC document attribute | Initial Vcard property | vCard extensions (fields) |
|---|---|---|
| pcc-type | ▨ | X-CAB-PCC-TYPE<br>Purpose: To specify the kind of object the vCard represents.<br>Value type: A single text value.<br>Cardinality: (0,1)<br>Special note: The value may be one of: "individual", "group" and "organization" .<br>If this property is absent, "individual" MUST be assumed as default. |

| | | |
|---|---|---|
| Contact-type (type, contact-type-source)<br>&entry-status<br>& Contact-subscription-status<br>& Contact-source | ▨ | X-CAB-CONTACT-STATUS<br>Purpose: To specify the CAB status of the object the vCard represents.<br>Value type: A single structured value consisting of 5 values separated by the SEMI-COLON character (ASCII decimal 59) :<br>1 contact-type (possible value : "CAB" if the contact is a CAB user, "non-CAB" if the contact is not a CAB user)<br>2 contact-type-source (possible values: "presence ", "cab_subscription", "cab_search", "other")<br>3 entry-status. This field is composed of one or both of the following sub-fields :<br>- updated : indicating that the contact has been updated by the CAB server, as a result of automatic updates from incoming subscription request(s) (possible values : "incoming subscription request") and contact share (possible values: "contact share") (values are separated by commas). |

| | | |
|---|---|---|
| | | - temporary (possible values : "contact subscription", "contact imported", "contact added", "incoming subscription request" and contact share (possible values: “contact share”). This field may include a X-CAB-CONTACT-ID-REF parameter (field value and parameter are separated by a comma).<br>4 contact-subscription-status (possible values : "active", "pending", "denied", "invalid filter", "not found", "other_error")<br>5 contact-source indicating the latest source from which the contact data was obtained or updated (default value "CAB")<br>Cardinality: (1,1) |

**<u>Person-details elements</u>**

| | | |
|---|---|---|
| Gender | | X-CAB-SEX<br>Purpose: To specify the sex of the object the vCard represents, as defined in [ISO.5218.2004].<br>Value type: A single integer value.<br>Cardinality: (0,1)<br>Special note: The value 0 stands for "not known", 1 stands for "male", 2 stands for "female", 3 stands for “other” and 9 stands for "not applicable". |
| Language-entry | | X-CAB-LANG<br>Purpose: To specify the language(s) that may be used for contacting the individual associated with the vCard.<br>Value type: A single language-tag value.<br>Cardinality: (0,n)<br>Special note: This property can include "X-CAB-LANGUAGE-PROFICIENCY-TYPE", "X-CAB-LANGUAGE-FLUENCY-TYPE" parameters. This property can include an "X-CAB-INDEX" parameter. |
| Service-entry | | X-CAB-SERVICE<br>Purpose: To specify the aliases used on different sites by the object that the vCard refers to.<br>Value type: A single structured value consisting of 3 values separated by the SEMI-COLON character (ASCII decimal 59) :<br>1 label<br>2 alias<br>3 url<br>Cardinality: (0,n)<br>Special note: This property can include the "X-CAB-INDEX" parameter |
| Expertise-entry | | X-CAB-EXPERTISE<br>Purpose: To specify the expertise(s) of the object that the vCard refers to.<br>Value type: A single string value.<br>Special note: This property can include the X_CAB-LEVEL parameter (possible values : "beginner", "average", "expert"). This property can include the "X-CAB-INDEX" parameter.<br>Cardinality: (0,n) |
| Hobby-entry | | X-CAB-HOBBY<br>Purpose: To specify the hobbies of the object that the vCard refers to.<br>Value type: A single string value.<br>Special note: This property can include the X_CAB-LEVEL parameter (possible |

| | | |
|---|---|---|
| | ▨ | values : "high", "medium", "low"). This property can include the "X-CAB-INDEX" parameter.<br><br>Cardinality: (0,n) |
| Interest-entry | ▨ | X-CAB-INTEREST<br><br>Purpose: To specify the interest(s) of the object that the vCard refers to.<br><br>Value type: A single string value<br><br>Special note: This property can include the X-CAB-LEVEL parameter (possible values : "high", "medium", "low"). This property can include the "X-CAB-INDEX" parameter.<br><br>Cardinality: (0,n) |
| Public-note | ▨ | X-CAB-PUBLICNOTE<br><br>Purpose: To specify additional information associated with the object the vCard refers to.<br><br>Value type: A single string value<br><br>Cardinality: (0,n) |

Organization-directory

| | | |
|---|---|---|
| Org-directory | <ORG> | X-CAB-ORG-DIRECTORY<br><br>Purpose: To specify the organization-directory of the object the vCard represents.<br><br>Value type: A single structured value consisting of :<br><br>- directory (a URI)<br><br>Cardinality: (0,n)<br><br>Special note: This property can include the PREF and X-CAB-INDEX parameters. |