Enhanced Visual Call

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1. Scope

The scope of Enhanced Visual Call (EVC) Enabler is to define an interoperable service framework that enables seamless integration of a call and various enriched information (e.g., visual, text) provided to the EVC User in association with the call. The enriched information can be exchanged during different stages (pre-call, during the call, after the call) of a standard/plain call or an Interactive Voice Response (IVR) call. EVC Enabler use cases connect together consumer type of users and business users, enabling service reachability to both market segments.

This Enabler Release (ER) document is a combined document that contains the requirements, architecture and the detailed technical specifications for the EVC Enabler. High-level requirements and overall system requirements as well as several use cases which provide examples of services that should be enabled by EVC Enabler are specified in this document. This specification also defines the architectural interfaces, functional components, high level flows that address all the requirements in this document. It further includes the technical realization of EVC 1.0 requirements.

2. References

2.1 Normative References

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[3GPP TS33.178]	"Security aspects of early IP Multimedia Subsystem(IMS)" 3GP,TS 33.178, URL:http://www.3gpp.org/
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[RFC2119]	"Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt
[RFC3261]	"SIP: Session Initiation Protocol", J. Rosenberg et al, June 2002, URL:http://www.ietf.org/rfc/rfc3261.txt
[RFC3264]	"An Offer/Answer Model with the Session Description Protocol (SDP)", J. Rosenberg H. Schulzrinne, June 2002, URL:http://www.ietf.org/rfc/rfc3264.txt
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2.2   Informative References

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[OMA Privacy RD] "Privacy Requirements for Mobile Services", Open Mobile Alliance™, OMA-RD-Privacy-V1_0, URL:http://www.openmobilealliance.org

[OMA-S_CAB-ERP] "Simplified Converged Address Book Enabler Release Package", Open Mobile Alliance™, OMA-ERP-S_CAB-V1_0, 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

Business Menu Publisher	Business side entity to publish and manage Visual IVR mappings.
Call Correlation Info	Information used to correlate audio calls and Enriched/ Visual IVR Information
Call Enhancement Data	Data that EVC User intends to share during an enhanced call.
Enhanced Visual Call	An audio call that is enhanced with visual information.
Enriched Information	Data that EVC User intends to share during an enhanced call.
EVC Client	The Client entity of EVC responsible for catering requests of EVC User.
EVC Server	The Server entity of EVC responsible for catering and managing EVC services to the EVC Client.
EVC User	User of EVC services.
EVC XDMS	The XDM entity of EVC responsible for XML document management.
First Menu	The landing page of a Visual IVR call.
Next Menu	Subsequent pages of the Visual IVR call after the First Menu.
Visual IVR Call	An IVR call with visual information.
Visual IVR Information	Mapping information used in a Visual IVR call.
Web Click	Input via web pages/visual information.

3.3 Abbreviations

3GPP	3rd Generation Partnership Project
3GPP2	3rd Generation Partnership Project 2
b2c	Business to Client
CPM	Converged IP Messaging
CPM	Converged IP Messaging
CS	Circuit-switched
DM	Device Management
DTMF	Dual-tone Multi-frequency
EVC	Enhanced Visual Call
HTTP	Hyper Text Transfer Protocol
IARI	IMS Application Reference Identifier
ICSI	IMS Communication Service Identifier
IMS	IP Multimedia Subsystem
IVR	Interactive Voice Response
MMD	Multimedia Domain

MMTel	Multi-media Telephony
MSISDN	Mobile Station International Subscriber Directory Number
MSRP	Message Session Relay Protocol
OMA	Open Mobile Alliance
p2p	Peer to Peer
PRS	Presence
PRS	Presence
PS	Packet-switched
RFC	Request For Comments
RTP	Real-time Transport Protocol
S-CAB	Simplified Converged Address Book
SIP	Session Initiation Protocol
SNS	Social Networking Service
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
URN	Uniform Resource Name
wpc	Web plus Call
XDM	XML Document Management
XDMC	XDM Client
XDMS	XDM Server
XML	eXtensible Markup Language

4. Introduction

Traditionally services like call (voice call, video call) and data (e.g. web browsing, apps) are accessed independently by the user. Since the call and data are happening on different interfaces, it is difficult to use call and data at the same time even if they are related to each other, thus limiting the user experience. With the emergence of smartphones with large screens and high-speed data networks, this limitation can be eliminated by enhancing user experience. The current Interactive Voice Response (IVR) systems are limited to computer generated voice menu and voice or Dual Tone Multi Frequency (DTMF) input to cater services to the user, without the possibility to display IVR call related visual information. So this limitation can be eliminated by presenting the visual content alongside the call's audio, allowing user's interaction with that visual content.

The aim of EVC Enabler is to define scenarios, requirements and specification for seamless integration of voice and data/visual information, enhancing the user experience e.g., automatically supplementing call with the data that best matches the call context. Following are some of the features or user experiences on which the Enhanced Visual Call service delivery is built based upon:

- Delivery of visual information related to the other party to the caller/callee in the pre-call and/or during the call and/or after the call (e.g. individual or business profile/web information/social activity)

- Sync of user interaction between the visual information provided and the audio media

- Delivery of user selection to the callee (e.g. menu item selected by the user)

- Establishment of interaction session with an individual or business (e.g. web page sharing)

- Incorporate a Business profile search based on existing standard interfaces, into the EVC flow (e.g for food delivery or visiting the nearest grocery)

- Incorporate existing Interfaces for profile management and web page management by the user and/or 3rd parties, into the EVC flow

- Interworking with a non-EVC party (e.g. handling EVC enriched data with users that do not have EVC service and enriched data)

4.1 Version 1.0

The version 1.0 of the EVC Enabler defines a service-level framework that enables an interoperable seamless integration of call i.e., standard/plain call, Interactive Voice Response (IVR) call with enriched visual information associated to the call.

This version of the EVC Enabler provides the features covered by the requirements marked as EVC V1.0 in the tables of Section 6.

5. Requirements   (Normative)

Note that, in the following requirements, 'call' may refer either to 'audio call' or 'video call'.

5.1   High-Level Functional Requirements

Label	Description	Release
EVC-HLF-001	The EVC Enabler SHALL be able to provide visual (web-based) information (e.g. SNS page, restaurant menu, call centre home page) related to the other party in the call (individual or business), to the EVC user, in one or more of the following cases: • at the time call is being placed with that individual or business • prior to placing a call to that individual or business • at the time while call is ongoing with that individual or business.	EVC V1.0
EVC-HLF-002	The EVC Enabler SHALL enable the EVC User to select and send option(s) (e.g. menu item selected by the EVC user) from the visual/audio information (received at the time while making a call and/or during a call with the corresponding individual or business), if the visual/audio information includes selection options.	EVC V1.0
EVC-HLF-003	The EVC Enabler SHALL enable the EVC User to view synchronized visual and audio information, irrespective of the user input method (e.g., voice, web click, DTMF).	EVC V1.0
EVC-HLF-004	The EVC Enabler SHALL support to push visual information to the EVC User.	EVC V1.0
EVC-HLF-005	The EVC Enabler SHALL support to pull visual information by the EVC User.	EVC V1.0
EVC-HLF-006	The EVC Enabler SHALL support to obtain visual information corresponding to the audio information, and vice versa.	EVC V1.0
EVC-HLF-007	The EVC Enabler SHALL support correlating call with the associated visual/audio information	EVC V1.0
EVC-HLF-008	The EVC Enabler SHALL support EVC User to respond with real-time text to call invitation.	EVC V1.0
EVC-HLF-009	The EVC Enabler SHALL support EVC User to respond with real-time messages (i.e. picture/audio/video) to call invitation and receive voice from the caller.	Future
EVC-HLF-010	The EVC Enabler SHALL support EVC User to respond with real-time messages (i.e. text) and voice to call invitation and receive real-time messages and voice from the caller.	Future
EVC-HLF-011	The EVC Enabler SHALL support EVC User to respond with real-time messages (i.e. picture/audio/video) to call invitation and receive real-time messages and/or voice from the caller.	Future
EVC-HLF-012	The EVC Enabler SHALL support EVC User to respond with tentative response (e.g. 'hang on a second') in real-time message to a call invite before continuing to exchange voice.	EVC V1.0
EVC-HLF-013	The EVC Enabler SHALL support EVC User to reject the incoming call by responding with real-time message.	EVC V1.0
EVC-HLF-014	The EVC Enabler SHALL be able to provide audio/visual information based on the ongoing communication context.	EVC V1.0

Table 1: High-Level Functional Requirements

5.1.1   Security

Label	Description	Release
EVC-SEC-001	The EVC Enabler SHALL provide a mechanism to protect EVC User from receiving an unwanted message, according to the user preferences (e.g., black list, block advertisements) and the service provider policy.	EVC V1.0
EVC-SEC-002	The EVC Enabler SHALL provide a security mechanism to deny access to EVC-network based functionalities by unauthorized Principals.	EVC V1.0
EVC-SEC-003	The EVC Enabler SHALL support a security mechanism to preserve the integrity and confidentiality of EVC User's communication and visual information.	EVC V1.0
EVC-SEC-004	The EVC Enabler SHOULD provide capabilities of content screening (e.g., blocking, allowing, or amending visual information) prior to delivery of the visual information to the EVC User, according to the service provider policy.	Future

Table 2: High-Level Functional Requirements - Security

5.1.1.1   Authentication

Label	Description	Release
EVC-AUC-001	The EVC Enabler SHALL support a Principal to be authenticated by the service provider's domain.	EVC V1.0
EVC-AUC-002	The EVC Enabler SHALL support a Principal to authenticate the service provider's domain.	EVC V1.0
EVC-AUC-003	The EVC Enabler MAY leverage the authentication capabilities of the underlying IP network to authenticate a Principal.	EVC V1.0
EVC-AUC-004	The EVC Enabler MAY leverage the authentication capabilities of the underlying IP network to allow a Principal to authenticate the service provider's domain.	EVC V1.0

Table 3: High-Level Functional Requirements - Authentication

5.1.1.2   Authorization

Label	Description	Release
EVC-AUT-001	The EVC Enabler SHALL verify, if applicable by the service provider policy, whether a Principal is authorized to perform the action(s) it requested.	EVC V1.0
EVC-AUT-002	The EVC Enabler SHALL prevent unauthorized access to EVC User's related contents/information stored in the network.	EVC V1.0
EVC-AUT-003	The EVC Enabler SHALL support the EVC User to manage default authorization rule to be applied to any EVC User that are not explicitly identified within the authorization rules.	EVC V1.0
EVC-AUT-004	The EVC Enabler MAY provide a mechanism to prevent unauthorized access to an EVC User's related contents/information stored on his/her device(s) (e.g. lost or stolen device).	Future
EVC-AUT-005	The EVC Enabler SHALL support the EVC User to manage authorisation rules (e.g. to retrieve/search/modify the EVC User's published contents) that allow others to obtain information from his/her published audio/visual information.	Future

Table 4: High-Level Functional Requirements - Authorization

5.1.1.3   Data Integrity

Label	Description	Release
EVC-INT-001	The EVC Enabler SHALL ensure data integrity of the EVC User's data (e.g. audio/visual information, communication).	EVC V1.0

Table 5: High-Level Functional Requirements - Data Integrity

5.1.1.4   Confidentiality

Label	Description	Release
EVC-CON-001	The EVC Enabler SHALL support confidentiality of data (e.g., audio/visual information, communication) exchange.	EVC V1.0

Table 6: High-Level Functional Requirements - Confidentiality

5.1.2   Charging Events

Label	Description	Release
EVC-CHG-001	The EVC Enabler MAY support a set of charging events to support various business models.	Future

Table 7: High-Level Functional Requirements - Charging Events

5.1.3   Administration and Configuration

Label	Description	Release
EVC-ADM-001	The EVC Enabler SHALL provide a mechanism for remote provisioning and configuration of the EVC User's device(s).	EVC V1.0

Table 8: High-Level Functional Requirements - Administration and Configuration

5.1.4   Interoperability

Label	Description	Release
EVC-IOP-001	The EVC Enabler SHALL be able to support communication and visual/audio information exchange among EVC Users from different service providers	EVC V1.0

Table 9: High-Level Functional Requirements - Interoperability

5.1.5   Privacy

Label	Description	Release
EVC-PRV-001	The EVC Enabler SHALL provide mechanisms to protect privacy of EVC Users, e.g. based on requirements specified in [OMA Privacy RD].	EVC V1.0

Table 10: High-Level Functional Requirements - Privacy

5.2   Communication Requirements

Label	Description	Release
EVC-COM-001	The EVC Enabler SHALL enable the EVC User (i.e., individual or business) to provide call related visual information (e.g., emergency degree, call reason description etc) to the callee while initiating a call.	EVC V1.0
EVC-COM-002	The EVC Enabler SHALL support to deliver and display call related visualized information (e.g., emergency degree, call reason description etc), if available, to the callee while receiving call.	EVC V1.0
EVC-COM-003	The EVC Enabler SHALL support the EVC User to store profile information of other communicated EVC Users, locally in his/her device(s), subject to the user preferences and service provider policy.	EVC V1.0
EVC-COM-004	The EVC Enabler SHALL be able to provide caller's and/or callee's profile information of an individual or an enterprise as visual information to other EVC user.	EVC V1.0
EVC-COM-005	The EVC Enabler SHALL support the EVC User to store profile information of other communicated EVC Users, in his/her network repository, subject to the user preferences and service provider policy.	Future
EVC-COM-006	The EVC Enabler SHALL support the EVC User to store the communication history including audio/visual information if applicable, locally in his/her device(s) and/or network repository, subject to the user preferences and service provider policies.	Future
EVC-COM-007	The EVC Enabler SHALL support simultaneous display (and control) of visual information (e.g., web page sharing between the EVC User and and an individual or business, during a call). Note: The control of visual information is subject to user permissions (See EVC-PMG-001)	Future

Table 11: Communication Requirements

5.3   Permission Management Requirements

Label	Description	Release
EVC-PMG-001	The EVC Enabler SHALL support defining permissions (e.g., for EVC user only, for business only, or for both sides) to accept input during consumption of the visual information (e.g., web page).	Future
EVC-PMG-002	The EVC Enabler SHALL support displaying the permissions, if available, to the EVC user and the business.	Future

Table 12: Permission Management Requirements

5.4   Profile Management Requirements

Label	Description	Release
EVC-PRO-001	The EVC Enabler SHALL provide the capability for an individual EVC user to manage (e.g. create, retrieve, update, delete etc) his/her profile information (e.g. portrait, free text, favourite link) in multi-device environment.	Future
EVC-PRO-002	The EVC Enabler SHALL provide the capability for an individual EVC user to manage the visual/audio information and their association related to his/her profile in multi-device environment.	Future
EVC-PRO-003	The EVC Enabler SHALL allow the EVC user (individual or business) to identify the relationship category (e.g. friend, stranger, registered customer, new customer) between the communicating EVC users.	Future
EVC-PRO-004	The EVC Enabler SHALL allow the EVC user (individual or business) to provide different audio and/or visual information to the communicating EVC users according to the relationship (e.g. friend, stranger, registered customer, new customer) between them.	Future
EVC-PRO-005	The EVC Enabler SHALL enable the business EVC User to manage visual/audio information and their association with its business profile.	Future
EVC-PRO-006	The EVC Enabler SHALL support EVC Users to search the individual or business profile directory based upon the users' preferences.	Future
EVC-PRO-007	The EVC Enabler SHALL provide a mechanism to allow an EVC User to obtain the prioritized search results, subject to the user preference and service provider policies.	Future
EVC-PRO-008	The EVC Enabler SHALL support to share the individual or business profile, subject to the service provider policies.	Future
EVC-PRO-009	The EVC Enabler SHALL support to subscribe the individual or business profile, subject to the service provider policies.	Future
EVC-PRO-010	The EVC Enabler SHALL allow an EVC User to invite other EVC users to subscribe to his/her published profile based on service provider policy.	Future
EVC-PRO-011	The EVC Enabler SHALL allow an EVC User to receive suggestions of new profile information from EVC Service Provider and/or 3rd party system, subject to the user preferences and service provider policy.	Future
EVC-PRO-012	The EVC Enabler SHALL support to subscribe to the suggestions of new profile information from EVC Service Provider and/or 3rd party system, subject to the user preferences and service provider policy.	Future

Table 13: Profile Management Requirements

5.5   Content Sharing Requirements

Label	Description	Release
EVC-CTS-001	The EVC Enabler SHALL support content (e.g. image, audio, video, location, file etc) sharing during the call or outside the call.	EVC V1.0
EVC-CTS-002	The EVC Enabler SHALL suport a live contents sharing (e.g., web page, screen, music, sketching etc) sharing during the call or outside the call.	Future
EVC-CTS-003	The EVC Enabler SHALL support to push content(s) to the EVC User.	EVC V1.0
EVC-CTS-004	The EVC Enabler SHALL support to pull content(s) by the EVC User.	EVC V1.0

Table 14: Content Sharing Requirements

5.6   Multiple Device Support Requirements

Label	Description	Release
EVC-MDS-001	The EVC Enabler SHALL allow the EVC User in multi-device environment (e.g. on mobile, tablets, television) to consume his/her visual information viewing and calling, e.g., viewing visual information on television and calling by mobile.	EVC V1.0
EVC-MDS-002	The EVC Enabler SHALL provide the capabilities to synchronize visual information with the calling between multiple devices of the same EVC User when visual information and calling being distributed on different EVC enabled devices.	EVC V1.0
EVC-MDS-003	The EVC Enabler SHALL provide visual and/or audio information, if available, according to the capability of the EVC User's preferred device and service provider policy.	EVC V1.0
EVC-MDS-004	The EVC Enabler SHALL allow the EVC User to seamlessly transfer visual information being viewed from his/her device to his/her another device.	EVC V1.0

Table 15: Multiple Device Support Requirements

5.7   Usability Requirements

Label	Description	Release
EVC-USA-001	The EVC Enabler SHALL support to accept EVC user's input in one or multiple forms (e.g., voice, web click, DTMF).	EVC V1.0
EVC-USA-002	The EVC Enabler SHALL support the EVC User to manage his/her user preferences.	Future

Table 16: Usability Requirements

5.8   Interworking Requirements

Label	Description	Release
EVC-IWG-001	The EVC Enabler SHALL provide an interworking framework to import data (e.g. social network content) from 3rd party systems.	EVC V1.0
EVC-IWG-002	The EVC Enabler SHALL support interworking with non-EVC users.	Future
EVC-IWG-003	The EVC Enabler SHALL allow an EVC User to request the import/export of profile information from/to a 3rd party systems.	Future
EVC-IWG-004	The EVC Enabler SHALL allow an EVC User to request the subscription of changes in the user's external profile at a 3rd party systems to keep profile up-to-date.	Future
EVC-IWG-005	The EVC Enabler SHALL provide an interworking framework to export data (e.g. social network content) with 3rd party systems.	Future

Table 17: Interworking Requirements

5.9   Social Interaction Requirements

Label	Description	Release
EVC-SOC-001	The EVC Enabler SHALL support the EVC User to express feedback (e.g., Like) to an EVC call, visual/audio information.	Future
EVC-SOC-002	The EVC Enabler SHALL support EVC User to obtain social activity (e.g., posting a status message, posting a comment) information of an individual or a business as visual information.	Future
EVC-SOC-003	The EVC Enabler SHALL allow an EVC User, if authorized, to retrieve another EVC User's presence information (e.g. available/not available for content sharing), subject to the user preferences and service provider policy.	Future
EVC-SOC-004	The EVC Enabler SHALL allow the EVC User to establish a social relationship (e.g. setting up the EVC User as 'colleague', 'friend' etc) with other EVC User(s), subject to the user preferences and service provider policy.	Future

Table 18: Social Interaction Requirements

5.10   Overall System Requirements

Label	Description	Release
EVC-OSR-001	Recognizing the existence of current standards-based communication services (e.g. voice, messaging, social network), the EVC Enabler SHOULD re-use as appropriate (e.g. through reference) relevant parts of the associated supporting specifications.	EVC V1.0

Table 19: Overall System Requirements

6. Architectural Model

6.1 Dependencies

The EVC Enabler utilizes several existing enablers specified by OMA, as follows:

- Messaging and Push: CPM Enabler as described in [OMA-CPM-ERP]

- XML document management: XDM Enabler as described in [OMA-XDM-ERP]

- Device provisioning: Device Management Enabler as described in [OMA-DM-ERP]

- Presence: Presence Enabler as described in [OMA-PRS-ERP]

- Profile management and Communication History as described in OMA Address Book Enablers [OMA-S-CAB-ERP]

Furthermore, the EVC Enabler is dependent on an underlying SIP/IP core infrastructure to transport SIP messages between the EVC functional components. A particular instantiation of the SIP/IP core infrastructure is the IP Multimedia Subsystem as specified in either [3GPP TS23.228], [3GPP TS24.229] or [3GPP2 X.S0013-002].

In addition, the EVC Enabler supports enhanced call; the call can be either CS call or PS call. And the call client MAY correspond to IMS Multimedia telephony (MMTel) communication service and supplementary services as specified in [3GPP TS14.173].

6.2 Architectural Diagram
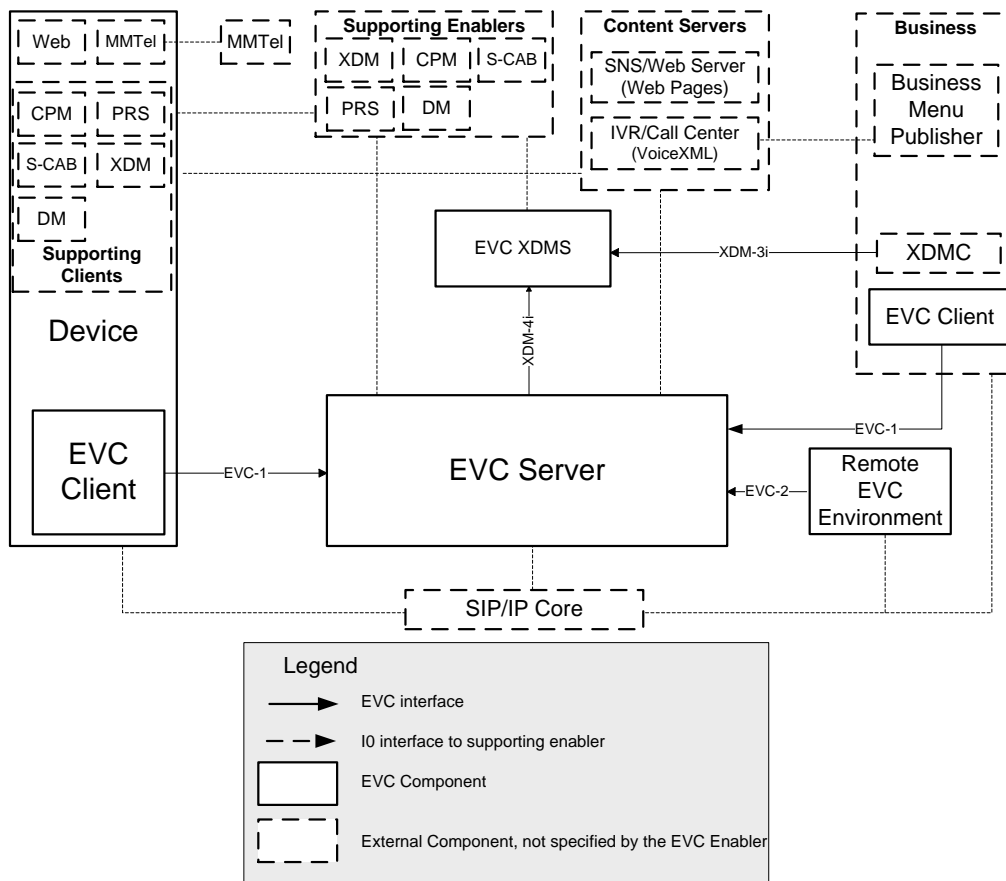
Figure 1: EVC Architectural Diagram

The Figure 1 presents the EVC architecture diagram, depicting the EVC Enabler's functional components and their interactions with each other, and as well as with external entities (on the device and on the network) such as the Supporting Enablers.

The EVC Enabler consists of the following EVC functional components:

- The EVC Client, which resides in the EVC User's Device and allows the EVC User to use the EVC-enabled services by interacting with other EVC functional components and other external entities.

- The EVC Server, which resides in the network domain and interacts with the EVC Client and other network components such as the EVC XDMS, external entities.

- The EVC XDMS, which resides in the network domain and is a logical server entity which provides XML document management specific for the EVC Enabler.

The EVC functional components, if and when needed, interact with the following external entities:

- A SIP/IP core, which is an underlying infrastructure that provides SIP-based and IP-based functionalities that are needed to support the EVC Enabler.

- The following supporting Enablers, which are other OMA Enablers used to support the EVC Enabler:

  o The CPM Enabler, which provides communication capabilities to support interactions between the EVC Users (individual and business), and push capabilities.

  o The XDM Enabler, which provides XML document management capabilities to support creating, storing and managing the user and service data such as the user preferences, the service provider policy.

  o The DM Enabler, which provides device management to support remote management of EVC-specific device parameters.

  o The Presence Enabler, which provides the capabilities of retrieving and publishing the user's presence information.

  o The S-CAB Enabler, which provides the management capabilities about the user's PCC information and communication history to the EVC Enabler.

- The Content Servers, which supports the functionalities of storing and providing the content (e.g. VoiceXML, Web pages, SNS) required for rendering to the EVC Users.

- The MMTel Service, which provides the multi-media call functions (individual to individual, individual to business, IVR) for the EVC Users.

- The Business Menu Publisher which provides business menu content (e.g., VoiceXML, Web pages).

- The Business side XDMC which provides the correlation information between VoiceXML and Web pages.

- A Remote EVC Environment, which is an EVC environment residing in another (remote) network.

6.3 Functional Components and Interfaces/reference points definition

6.3.1 Functional Components

6.3.1.1 EVC Client

The EVC Client resides in a Device. It is used to access network-based EVC functional components. The other functional components in the Device may communicate internally with the EVC Client.

NOTE: Specifying interfaces or protocols for internal communication within a Device is out of scope of the EVC Enabler.

The EVC Client is involved in the following high level functionalities:

- SIP/IP core related communication

- o   Registration of the EVC Client

- Client-side EVC service logic execution

   - o   Correlation of EVC Call Enhancement data (e.g., links, ID), visual data (e.g., web page, content) with the call

   - o   Correlation of EVC IVR data (e.g., link mapped to landing page IVR, link mapped to next menu IVR) with the IVR call

- Generating and sending request to transfer EVC data

- Receiving and processing EVC data

- Communication internal to the Device with the supporting Enablers clients.

6.3.1.2   EVC Server

The EVC Server is a user-specific functional component. Its functionalities are performed in EVC User's home network, and are invoked when servicing the requests from the EVC User. The EVC Sever handles requests related to EVC data, on behalf of the EVC User it serves and enforces EVC user preferences and service provider policies. Additionally, the EVC Server is responsible for authorization and authentication of all the requests coming from or terminating into EVC Client. The EVC Server also handles EVC Client registration, ensures data integrity and confidentiality and user privacy.

The EVC Server also interacts with:

- the EVC XDMS, for retrieving IVR mapping information.

- the External Content Servers.

- the Supporting Enablers e.g., XDM, DM etc., for handling EVC Client requests.

6.3.1.3   EVC XDMS

The EVC XDMS is a server entity as described in [OMA-XDM-AD] sub clause 5.3.1.6. EVC XDMS is an EVC Enabler Specific XMDS(s) (see [OMA-XDM-AD], sub clause 5.3.1.12), and specifies the EVC Enabler related Application Usages which are logical in nature and may be implemented as one or more server-side entities.

EVC XDMS [EVC-TS-XDM] stores IVR mapping information provided by the Business.

6.3.1.4   External Functional Components

6.3.1.4.1   SIP/IP Core

The SIP/IP core includes a number of SIP proxies and SIP registrars as defined in [RFC3261]. The SIP/IP core performs the following functions that are needed to support the EVC Enabler:

- Routing the SIP signaling;

- Providing address resolution services;

- May provide charging information;

- Providing SIP compression;

- Performing authentication and authorization of the EVC User at the EVC Client based on the user's service subscription;

- Providing and maintaining registration of EVC Clients and their associated EVC User Address(es) and device identifier;

- Providing support for the EVC User Address anonymity in the SIP signaling as described in [RFC3325];

- Providing list of registered devices and their capabilities;

- Providing support for NAT traversal;

- Providing support for management of the EVC Server's subscriptions about the clients' registration information according to [RFC3680] and [RFC5628].

When the SIP/IP core is based on the 3GPP IMS or 3GPP2 MMD, its architecture is specified in 3GPP [3GPP TS23.228] or 3GPP2 [3GPP2 X.S0013-002], respectively.

6.3.1.4.2   Converged IP Messaging (CPM) Enabler

The EVC Enabler SHALL use CPM Enabler to perform the following functions:

- Communication activity between EVC Users (e.g. messaging, content sharing);

The functionalities provided by the CPM Enabler are as described in [OMA-CPM-ERP].

6.3.1.4.3   XML Document Management (XDM) Enabler

The EVC Enabler SHALL use XDM Enabler to perform the following functions:

- Management of EVC XML documents (e.g. mapping information)

- Searching of EVC XML documents

- Subscription to changes in EVC XML documents

- Access permission management of EVC users

The functionalities provided by the XDM Enabler are specified in [OMA-CPM-ERP].

6.3.1.4.4   Address Book Enabler(s)

The EVC Enabler SHALL use OMA Simplified Converged Address Book Enabler (S-CAB) to perform the following functions:

- Management of EVC users profile information, and

- Communication history of EVC users

The functionalities provided by the Address Book Enabler(s) are specified in [OMA-S-CAB-ERP].

6.3.1.4.5   Presence Enabler

The EVC Enabler SHALL use Presence Enabler to perform the following functions:

- Publish and retrieve presence information of EVC users.

The functionalities provided by the Presence Enabler are specified in [OMA-PRS-ERP].

6.3.1.4.6   Device Management (DM) Enabler

The interaction between the EVC Client and the DM Client as an external entity SHALL enable the following supporting functions:

- Receive the initial parameters needed for EVC Service sent by service provider by using mechanisms specified in [OMA-DM-ERP].

- Retrieve and update the parameters needed for EVC Client sent by a service provider by using [OMA-DM-ERP].

The interaction between the EVC Server and the DM server as an external entity SHALL enable the following supporting functions:

- Initialization and updating of all the configuration parameters necessary for the EVC Client.

- Software update for terminals allowing EVC Client upgrade.

The detailed description of the functionalities is given in [OMA-DM-ERP].

Parameters to be provisioned for EVC are described in [OMA-TS-EVC-MO].

6.3.1.4.7 Remote EVC Environment

The Remote EVC Environment is the EVC environment residing in another (remote) network.

This Remote EVC Environment is a mirror of the environment described in this document, and can contain the full set of EVC functional components described in this document or a subset thereof.

The EVC Enabler interacts with the Remote EVC Environment to allow EVC Users of the local EVC environment to interact with EVC Users of the other (remote) network.

6.3.1.4.8 Call Handling

The Call Handling client is realized by referencing existing telephony clients providing voice telephony services to the EVC User, e.g., MMTel (Multimedia Telephony) Client, as defined in 3GPP or a 3GPP Circuit Switched voice native application on the device. Hence the call means either Circuit Switched voice or Packet Switched voice.

6.3.1.4.9 External Content Servers

6.3.1.4.9.1. Web Servers (SNS/Web Pages)

The Web Servers perform the following functions:
- Storing SNS/Web page contents, ensuring data integrity and confidentiality;
- Handling of authentication and authorization to Web/SNS content;
- Provide access to Web/SNS content through HTTP-based interface e.g. Contents Handling Client.

6.3.1.4.9.2. IVR Servers (Voice XML)

The IVR Servers perform the following functions:
- Deliver IVR voice content to Call Handling Client;
- Receive and handle DTMF/voice input from Call Handling Client and return the corresponding voice.

6.3.1.4.10 Business Menu Publisher

Business Menu Publisher allows the Business Users of EVC to publish and manage their content, for e.g. web pages, voice-xml etc, on the external content servers like Web Servers and traditional IVR Servers.

6.3.1.4.11 The Content Handling client (Web Client)

The Content Handling client can be realized in various ways, in this specification is assimilated in most cases to a Web Client. The Content Handling client is used to access the web content available on external content servers like Web Servers and SNS Servers.

6.3.2 Interfaces

6.3.2.1 EVC-1

The EVC-1 interface is exposed by the EVC Server to allow the authorized EVC Client(s) to interact with, and access/trigger the functionalities of the EVC Server.

The EVC-1 interface SHALL support the following functionalities:
- Authentication and authorization of the EVC User
- Delivery of:
  - Call information
  - Links to rich content stored in the network (e.g. enriched call information)

       o   Reference/ID to content as a result of EVC user interaction (e.g. reference to order information)

       o   Real-time Message

- Retrieval of landing page URL or complete mapping structure for Visual IVR set up

- Retrieval of Next Menu URLs corresponding to DTMF/Voice input

- Retrieval of Next Menu DTMF/Text corresponding to Web input

- Handling information related to multiple devices

6.3.2.2   EVC-2

The EVC-2 interface is a network-to-network interface exposed by the EVC Server to allow the other network-side functional components (such as another EVC Server in a remote EVC environment) to interact with, and access/trigger the functionalities of the EVC Server.

The EVC-2 interface SHALL support the following functionalities:

- Exchange of information related to media content (e.g. call information, links to rich content, references to content as a result of EVC user interaction) between the EVC Servers.

- Exchange of landing page URL or complete mapping structure for Visual IVR set up

- Exchange of Next Menu URLs corresponding to DTMF/Voice input

- Exchange of Next Menu DTMF/Text corresponding to Web input

6.3.2.3   External Interfaces

6.3.2.3.1   XDM-3i

The XDM-3i interface, as defined in [OMA-XDM-ERP], is exposed by the EVC XDMS for the following functionality:

- To allow a business entity using an XDMC to manage its own EVC XML Documents stored in the EVC XDMS, once the necessary authentication is performed.

6.3.2.3.2   XDM-4i

The XDM-4i interface, as defined in [OMA-XDM-ERP], is exposed by the EVC XDMS for the following functionality:

- To allow EVC Server to retrieve EVC XML Documents stored in the EVC XDMS.

- To allow a trusted entity i.e. EVC Server using an XDMA to retrieve EVC XML Documents stored in the EVC XDMS.

7. Technical Specification

7.1 Common Procedures

7.1.1 Format of EVC Call Enhancements and Call Correlation

Following section is common for the call enhancements (Person-to-Person, Business-to-Person and Web + Call) except Real-time Message. Moreover only <call-correlation-info> and its child elements as defined here are applicable in Visual IVR, as mentioned in the relevant sections (7.2.3.2 and 7.3.3.1).

Enriched information shared in EVC is associated with a Call. Therefore, to correlate the enriched information with a call, a common XML structure is defined for the EVC specific events using the CPM event framework, as described in this section:

The element <evcenrichedinfo> is the root EVC event element that appears under the <cpm-evfw> element as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework", and:

- SHALL include one <call-correlation-info> element, which is used to uniquely identify the call associated with the enriched information, and it:

    o SHALL include one <from> element, which is the unique identifier of the originating EVC User and SHALL be either MSISDN or SIP URI;

    o SHALL include one <to> element, which is the unique identifier of the terminating EVC User and SHALL be either MSISDN or SIP URI;

    o MAY include one <call-seq> element, which is the unique identifier for identifying a PS call transaction;

    o MAY include one <subject> element, which is the information (reason) about the call added by the originating EVC User. The maximum length of the subject field SHALL be 100 characters;

    o MAY include any other elements, for extension purposes;

- SHALL include one <call-associated-data> element containing the enriched information that is being shared and

    o SHALL have a "type" attribute to indicate the type of scenario. The possible values are:

        ▪ "p2p" – to indicate person-to-person scenario

        ▪ "b2c" – to indicate business-to-client scenario

        ▪ "wpc" – to indicate web + call scenario

    o SHALL include one or more <link> elements for sharing a hyperlink: a HTTP URL to the information to which the originating EVC User wants to associate the call. The URL may represent a reference:

        ▪ User profile, blogs, SNS content, picture, or;

        ▪ Filled web form, or;

        ▪ Web content related to the call e.g. a link to the EVC User selected order information stored on the EVC User's account associated with the business;

    o MAY include one <location > for sharing EVC User's location information. The <location> element SHALL include the following:

        ▪ <lat> element which represents the latitude;

        ▪ <long> element which represents the longitude;

o MAY include one <web-reference-id> element for sharing EVC User's web transaction reference associated with the EVC User's browsing business web content information;

o MAY include any other element, for extension purposes;

The enriched information shared is specific to the service scenario being used. Hence, the applicable child elements of <call-associated-data> to each EVC service scenario are described in respective sections in this specification.

- MAY include any other elements, for extension purposes.

The EVC Client SHALL ignore any unrecognized elements not defined in this section.

See Appendix C for XML Examples.

7.2 Procedures at EVC Client

7.2.1 EVC Registration

The EVC Client SHALL, according to rules and procedures of [3GPP TS24.229] and the SIP/IP core,

– Perform SIP registration for the EVC Enabler to the SIP/IP core prior to using the EVC Enabler functionality. In a multi-device or multi-client context, the EVC Client also includes the Instance ID handling as per [3GPP TS24.229];

– Maintain SIP registration for the EVC Enabler active by using a re-registration procedure while the EVC Enabler is being used;

– Terminate SIP registration for the EVC Enabler after the EVC Enabler functionality is no longer used.

NOTE: The SIP registration can be shared with other SIP based Enablers at the Device hosting the EVC Client.

NOTE: When EVC Client registers to the SIP/IP Core, the registration request SHOULD include an Instance ID, the client information (e.g., client identifier), device information (e.g., device capabilities), and user information (e.g., user identifier).

7.2.2 EVC Call Enhancements

7.2.2.1 Service Identification

The following section defines the IARI for EVC Enabler.

3GPP has defined Service and Application Identifiers to be used for IMS services. These identifiers can be used by both Clients and Network. Clients can use the identifiers to indicate their capability to the network.

EVC Enabler uses an IARI to explicitly identify itself, for enriched information sharing.

The EVC IARI SHALL be: urn-7:3gpp-application.ims.iari.oma.evc

IARI is coded as URN and included into Contact and Accept-Contact header fields in SIP requests by using the 3GPP defined media feature tag: g.3gpp.iari-ref.

For example:

+g.3gpp.iari-ref="urn%3Aurn-7%3A3gpp-application.ims.iari.oma.evc"

7.2.2.2 Person to Person Call

This section describes the EVC Client side procedures for an EVC User placing a Person to Person call. The call request towards another EVC User is for sharing enriched information (e.g., SNS contents links) between them during the call establishment and/or during the call. The high level flow corresponding to this scenario is depicted in Section Appendix C.1.2.

7.2.2.2.1 Service Media Specification

The EVC event data for person-to-person SHALL be based on the <evcenrichedinfo> element structure as defined in section 7.1.1. , with the following clarifications:

- The "type" attribute SHALL be set to "p2p", and;

- The <web-reference-id> element SHALL NOT apply

7.2.2.2.2 Originating Procedures

Upon receiving the request from the EVC User to place a call for sharing enriched information, the EVC Client SHALL generate a SIP INVITE request according to the rules and procedures of [CPM-CONV-TS], for CPM Session with the following clarifications:

In particular, the EVC Client:

1. SHALL set the Request-URI to the address of the target EVC User;

2. SHALL include an Accept-Contact header field with EVC IARI Feature Tag 'urn:urn-7:3gpp-application.ims.iari.oma.evc' percent encoded in a g.3gpp.iari-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 "Coding of the IARI";

3. SHALL include the EVC User Address of the originating EVC Client that has been authenticated by the SIP/IP core, as authenticated originator's EVC address;

4. SHALL include in the User-Agent header field the OMA EVC release version of the EVC Client as specified in Appendix E "*Release Version in User-agent and Server headers*";

5. SHALL include a MIME SDP body as an SDP offer with the following clarification:

   a. SHALL set content type as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework";

6. SHALL send the SIP INVITE request towards the EVC Server according to the rules and procedures of the SIP/IP Core;

Upon successfully establishing the SIP session and MSRP media plane, the EVC Client:

1. SHALL populate MSRP SEND body as defined in section 7.2.2.2.1 "*Service Media Specification*" with the following additional clarifications:

   a. SHALL set the content disposition as Content-Disposition=by-reference;

   b. SHALL set the content description as Content-Description="p2p enriched information";

2. SHALL generate and send one or more MSRP SEND requests on the established MSRP connection.

The established SIP/MSRP session SHALL be used for sharing enriched information by either of the EVC Users throughout the duration of the call.

When the call corresponding to the elements of <call-correlation-info> is ended, the EVC Client SHALL terminate the EVC session following the procedures defined in [CPM-CONV-TS].

7.2.2.2.3 Terminating Procedures

Upon receiving a SIP INVITE request with the EVC IARI Feature Tag 'urn:urn-7:3gpp-application.ims.iari.oma.evc' included in the Accept-Contact header, if the EVC Client is selected to accept the request by the EVC User, it:

1. SHALL generate and send a SIP 200 "OK" response to the received initial SIP INVITE request according to the rules and procedures of [CPM-CONV-TS] with the following clarifications:

   a. The EVC Client SHALL include in the Server header the OMA EVC release version of the EVC Client as specified in Appendix E "*Release Version in User-agent and Server headers*".

Upon receiving an MSRP request, the EVC Client:

1. SHALL check if there is a call corresponding to the elements of <call-correlation-info> and if the call is found, then;

    a. SHALL check if there is a <call-associated-data> element, with "type" attribute set to "p2p" and process as follows;

        i. SHALL retrieve the contents for that link;

        ii. If <location> element is present, it SHALL retrieve the location information.

    b. SHALL present to the EVC User the retrieved enriched information along with the call.

2. If the associated call is not found, the EVC Client SHALL cache the enriched information and wait for the associated call. If the call is found before the timeout; EVC Client SHALL follow step 1, otherwise, on expiry of the timeout, EVC Client SHALL terminate the SIP session by sending a SIP BYE according to [CPM-CONV-TS].

NOTE: The EVC User may have multiple registered devices hosting EVC Client individually. If so, each of the registered EVC Clients will receive the SIP INVITE request.

NOTE: When the EVC Client receives a SIP INVITE request mentioned above, it shows related information to the EVC User. The EVC User can decide whether to accept the request mutually or automatically by pre-defined settings. If the EVC Client accepts the request, it SHOULD respond the request according to the procedures mentioned above; otherwise, it SHOULD ignore the request directly or respond other code to ignore the request.

NOTE: When the EVC Server receives a SIP 200 "OK" response mentioned above from an EVC Client to notify the EVC Client has accepted the request and started enriched content sharing, the EVC Server MAY send SIP CANCEL request to other registered EVC Client(s) if it had sent them the request respectively.

NOTE: The high level flow corresponding to this procedure is depicted in Section Appendix C.3.2.

7.2.2.3   Business to Client

This section describes the EVC Client side procedures for a Business EVC User placing a Business to Client call. The EVC request towards EVC Client is for sharing enriched information related to the business, during the call establishment and/or during the call. The high level flow corresponding to this scenario is depicted in Section Appendix C.2.2.

7.2.2.3.1   Service Media Specification

The EVC event data for business-to-person SHALL be based on the <evcenrichedinfo> element structure as defined in section 7.1.1, with the following clarifications:

- The "type" attribute SHALL be set to "b2c"

7.2.2.3.2   Originating Procedures

Upon receiving the request from the Business EVC User to share enriched information when placing a call, the EVC Client SHALL generate a SIP INVITE request according to the rules and procedures of [CPM-CONV-TS], for 1-1 CPM Session with the following clarifications:

In particular, the EVC Client:

1. SHALL set the Request-URI to the address of the target EVC User;

2. SHALL include an Accept-Contact header field with EVC IARI Feature Tag 'urn:urn-7:3gpp-application.ims.iari.oma.evc' percent encoded in a g.3gpp.iari-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 "Coding of the IARI";

3. SHALL include the EVC User Address of the originating EVC Client that has been authenticated by the SIP/IP core, as authenticated originator's EVC address;

4. SHALL include in the User-Agent header field the OMA EVC release version of the EVC Client as specified in Appendix E "Release Version in User-agent and Server headers";

5. SHALL include a MIME SDP body as an SDP offer with the following clarification:

    a. SHALL set content type as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework";

6. SHALL send the SIP INVITE request towards the EVC Server according to the rules and procedures of the SIP/IP Core;

Upon successfully establishing the SIP session and MSRP media plane, the EVC Client:

1. SHALL populate MSRP SEND body as defined in section 7.2.2.3.1 "*Service Media Specification*" with the following additional clarifications:

    a. SHALL set the content disposition as Content-Disposition=by-reference;

    b. SHALL set the content description as Content-Description="b2c enriched information";

2. SHALL generate and send one or more MSRP SEND requests on the established MSRP connection.

The established SIP/MSRP session SHALL be used for sharing enriched information by the Business EVC User throughout the duration of the call.

When the call corresponding to the elements of <call-correlation-info> is ended, the EVC Client SHALL terminate the EVC session following the procedures defined in [CPM-CONV-TS].

7.2.2.3.3 Terminating Procedures

Upon receiving a SIP INVITE request for 1-1 CPM Session, with the EVC IARI Feature Tag 'urn:urn-7:3gpp-application.ims.iari.oma.evc' included in the Accept-Contact header, if the EVC Client is selected to accept the request by the EVC User, it:

1. SHALL generate and send a SIP 200 "OK" response to the received initial SIP INVITE request according to the rules and procedures of [CPM-CONV-TS] with the following clarifications:

    a. The EVC Client SHALL include in the Server header the OMA EVC release version of the EVC Client as specified in Appendix E "*Release Version in User-agent and Server headers*".

Upon receiving an MSRP request, the EVC Client:

1. SHALL check if the event type is an EVC event, and if it is not then it SHALL reject the request with a "413" MSRP response and SHALL not continue with the following steps.

2. SHALL check if there is a call corresponding to the elements of <call-correlation-info> and if the call is found, then;

    a. SHALL check if there is a <call-associated-data> element, with "type" attribute set to "b2c" and process as follows;

        i. SHALL check the Content-Disposition header field and if set to "by-reference" then it SHALL retrieve the contents for that link/web reference id, else SHALL follow the procedures specified in RFC 2183;

    b. SHALL present to the EVC User the retrieved enriched information along with the call.

Otherwise, if the associated call is not found, the EVC Client SHALL terminate the SIP session by sending a SIP BYE request with a Reason header field set to code "200" to indicate explicit termination of the request, according to [CPM-CONV-TS].

NOTE: The EVC User may have multiple registered devices to support EVC-based service. The terminating-related procedures to support multiple devices on *Business to Client* scenario are same as those on the *Person to Person Call* (see section 7.2.2.2.3).

7.2.2.4 Web + Call

This section describes the EVC Client side procedures for an EVC User placing a web + call request. The call request from one EVC User (Consumer) towards another EVC User (Business) is for sharing the enriched information (e.g., links, web service transaction id) between them during the call establishment. The high level flow corresponding to this scenario is depicted in Section Appendix C.4.2.

7.2.2.4.1 Service Media Specification

The EVC event data for web + call SHALL be based on the <evcenrichedinfo> element structure as defined in section 7.1.1, with the following clarifications:

- The "type" attribute SHALL be set to "wpc".

7.2.2.4.2 Originating Procedures

NOTE: It is assumed that the EVC User has already browsed web content (e.g., business website) and is involved in a transaction.

Upon receiving the request from the EVC User to place a call for sharing call related enriched information (e.g., business web transaction), the EVC Client SHALL generate a SIP INVITE request according to the rules and procedures of [CPM-CONV-TS], for CPM Session with the following clarifications:

In particular, the EVC Client:

1. SHALL set the Request-URI to the address of the target EVC User;

2. SHALL include an Accept-Contact header field with EVC IARI Feature Tag 'urn:urn-7:3gpp-application.ims.iari.oma.evc' percent encoded in a g.3gpp.iari-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 "Coding of the IARI";

3. SHALL include the EVC User Address of the originating EVC Client that has been authenticated by the SIP/IP core, as authenticated originator's EVC address;

4. SHALL include in the User-Agent header field the OMA EVC release version of the EVC Client as specified in Appendix E "*Release Version in User-agent and Server headers*";

5. SHALL include a MIME SDP body as an SDP offer with the following clarification:

    a. SHALL set content type as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework";

6. SHALL send the SIP INVITE request towards the EVC Server according to the rules and procedures of the SIP/IP Core;

Upon successfully establishing the SIP session and MSRP media plane, the EVC Client:

1. SHALL populate MSRP SEND body as defined in section 7.2.2.4.1 "*Service Media Specification*" with the following additional clarifications:

    a. SHALL set the content disposition as Content-Disposition=by-reference;

    b. SHALL set the content description as Content-Description="web plus call enriched information";

2. SHALL generate and send one or more MSRP SEND requests on the established MSRP connection.

The established SIP/MSRP session SHALL be used for sharing enriched information by either of the EVC Users throughout the duration of the call.

When the call identified by the elements of <call-correlation-info> is ended, the EVC Client SHALL terminate the EVC session following the procedures defined in [CPM-CONV-TS].

7.2.2.4.3 Terminating Procedures

Upon receiving a SIP INVITE request with the EVC IARI Feature Tag 'urn:urn-7:3gpp-application.ims.iari.oma.evc' included in the Accept-Contact header, the EVC Client:

1. SHALL generate and send a SIP 200 "OK" response to the received initial SIP INVITE request according to the rules and procedures of [CPM-CONV-TS] with the following clarifications:

    a. The EVC Client SHALL include in the Server header the OMA EVC release version of the EVC Client as specified in Appendix E "*Release Version in User-agent and Server headers*".

Upon receiving an MSRP request, the EVC Client:

1. SHALL check if there is a call corresponding to the elements of <call-correlation-info> and if the call is found, then;

   a. SHALL check if there is a <call-associated-data> element, with "type" attribute set to "wpc" and process as follows;

      i. SHALL retrieve the contents for that link;

      ii. If <web-reference-id> element is present, it SHALL retrieve the content corresponding to the reference ID;

      iii. If <location> element is present, it SHALL retrieve the location information.

   b. SHALL present to the EVC User the retrieved enriched information along with the call.

2. If the associated call is not found, the EVC Client SHALL cache the enriched information and wait for the associated call. If the call is found before the timeout; EVC Client SHALL follow step 1, otherwise, on expiry of the timeout, EVC Client SHALL terminate the SIP session by sending a SIP BYE according to [CPM-CONV-TS].

7.2.2.5 Real-time Text Answer

This section describes the Terminating EVC Client side procedures that enable the EVC User to a use Real-time text answer to send either an acceptance message for the incoming call, or a rejection message for the call using the Real-time text answer.

Real-time text answer must use ITU-T Recommendation [T.140] real-time text according to the rules and procedures specified in [3GPP TS 26.114], with the following clarifications:

- The EVC Client must offer AVP for all media streams containing Real-time text;
- For Real-time text, RTCP reporting must be turned off by setting the SDP bandwidth modifiers "RS" and "RR" to zero;
- The sampling time used must be 300 ms;
- Change of the sampling time (rate adaptation) is not required.

The high level flow s describing how Real-time text answer is used in the context of EVC corresponding to these scenarios are depicted in Section Appendix C.7.2.1 and Section Appendix C.7.2.2.

7.2.2.5.1 Service Identification

The following section defines the ICSI for Real-time text answer.

3GPP has defined Communication Service and Application Identifiers to be used for IMS services. These identifiers can be used by both Clients and Network. EVC Clients can use the identifiers to indicate their capability to the network.

The Real-time Message ICSI SHALL be: urn-7:3gpp-service.ims.icsi.oma.evc.rtm

ICSI is coded as URN and included into Contact and Accept-Contact header fields in SIP requests by using the 3GPP defined media feature tag: g.3gpp.icsi-ref.

For example:

"+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.evc.rtm"

7.2.2.5.2 Procedures for the Terminating EVC Client (in a Caller role)

Upon receiving a SIP INVITE request with the EVC ICSI Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.evc.rtm' in the Accept-Contact header field, the EVC Client:

1. SHALL auto-accept the SIP IINVITE (i.e., without alerting the EVC User) and generate a SIP 200 "OK" response to the received initial SIP INVITE request according to the rules and procedures of [3GPP TS 24.229]with the following clarifications:

    a. The EVC Client SHALL include a Server header to indicate the OMA EVC release version of the EVC Client as specified in Appendix E "*Release Version in User-agent and Server headers*"

    b. The EVC Client SHALL include an answer SDP according to the rules and procedures of [3GPP TS 24.114]

2. SHALL send the SIP 200 "OK" response according to the rules and procedures of the SIP/IP core.

Upon receiving a SIP ACK request, the EVC Client:

1. SHALL handle the SIP ACK request according to the rules and procedures of [RFC3261];

2. SHALL establish the RTP connection according to the RTP connection parameters in the SDP offer received in the SIP INVITE request according to [3GPP TS 24.114];

When the EVC Client receives RTP request(s) containing Real-time text answer, the Client SHALL follow the rules and procedures defined in [3GPP TS 24.114], the EVC Client:

1. SHALL retrieve the EVC User's text message from the RTP body.

2. SHALL display the received Real-time Message along with the call.

3. MAY log the received real-time text answer together with the associated call event in the call log on the device.

Upon receiving a SIP BYE request, the EVC Client SHALL respond to the SIP BYE request as described in [3GPP TS 24.229].

7.2.2.5.3 Procedures for the Originating EVC Client (in a Callee role)

Upon receiving an incoming call, the terminating EVC Client of the callee SHALL present the EVC User with the option to answer using a real-time text answer. If the EVC User choses to provide a real-time text answer to the incoming call, the EVC Client SHALL generate a SIP INVITE request as described below.

The EVC Client SHALL handle the device internal correlation with the Call handling Client to map the real-time text answer provided by the EVC User, to the appropriate response for the incoming call (such as an acceptance real-time text answer signifies that the Call Handling Client accepts the incoming call, e.g. by sending a SIP 200 OK response to the call invitation).

Upon receiving the request from the EVC User to either accept or reject the incoming call with Real-time text answer, the EVC Client SHALL generate a SIP INVITE request according to the rules and procedures of [3GPP TS 24.229]. In particular, the EVC Client:

1. SHALL set the Request-URI to the address of the Caller;

2. SHALL include an Accept-Contact header field with the EVC ICSI Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.evc.rtm' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.1 "Coding of the ICSI";

3. SHALL include the EVC User Address of the originating EVC Client that has been authenticated by the SIP/IP core, as authenticated originator's EVC address;

4. If received in the SIP request for the associated call, it SHALL include the device identification of the recipient EVC Client i.e. either the public GRUU or the +sip.instance parameter in the Contact header field, as it was received in the SIP request for the call. This ensures that the EVC SIP request will be routed by the SIP/IP Core to the same device of the caller as the one that has initiated the associated call;

5. SHALL include a User-Agent header field to indicate the OMA EVC release version of the EVC Client as specified in Appendix E "*Release Version in User-agent and Server headers*";

6. SHALL include a MIME SDP body as an SDP offer according to the rules and procedures of [3GPP TS 26.114] with the following clarification:

    a. SHALL set the SDP directional media attribute to a=sendonly;

7. SHALL send the SIP INVITE request via the SIP/IP Core according to the rules and procedures of [3GPP TS 24.229];

On receiving a SIP 200 "OK" response to the sent SIP INVITE request, the EVC Client:

1. SHALL generate and send a SIP ACK request as an acknowledgement of the final response according to the rules and procedures of [RFC3261];

2. SHALL act as an RTP client and establish the RTP connection according to the RTP connection parameters in the SDP answer received in the SIP 200 "OK" response according to [3GPP TS 26.114] ;

Upon receiving EVC User's text message, the EVC Client:

1. SHALL populate RTP body with EVC User's text answer.

2. SHALL send the RTP requests(s) on the established RTP connection.

Upon EVC User's indication to end RTTM transmission (e.g. by closing the message composition window or pressing an explicit button), the EVC Client:

- SHALL close the EVC SIP session by sending a SIP BYE request with the Reason header field as defined in [RFC3326] with a protocol-value set to SIP and a protocol cause=200; and

- MAY log the real-time text answer together with the associated call event in the call log on the device.

If the EVC Client receives a SIP BYE request, it SHALL respond to the SIP BYE request as described in [3GPP TS 24.229].

If EVC Client is informed that a termination of the associated call has occurred, it SHALL terminate the EVC session immediately, as follows:

- If the EVC SIP session was established with the other EVC User, it SHALL send a SIP BYE request with the Reason header field as defined in [RFC3326], with a protocol-value set to SIP and a protocol cause=200;

    o If the Real-time text answer was not yet sent, it SHALL NOT send it before sending the SIP BYE.

- If it has not yet received a final SIP answer (2xx) for the EVC SIP INVITE, it SHALL generate and send a SIP CANCEL request to the other EVC User, to terminate the EVC session.

7.2.3   EVC Visual IVR

7.2.3.1   Service Identification

The following section defines the IARI for EVC Enabler.

3GPP has defined Service and Application Identifiers to be used for IMS services. These identifiers can be used by both Clients and Network. Clients can use the identifiers to indicate their capability to the network.

EVC Enabler uses an IARI to explicitly identify itself, for Visual IVR information sharing.

The EVC IARI SHALL be: urn-7:3gpp-application.ims.iari.oma.evc.visual-ivr

IARI is coded as URN and included into Contact and Accept-Contact header fields in SIP requests by using the 3GPP defined media feature tag: g.3gpp.iari-ref.

For example:

+g.3gpp.iari-ref="urn%3Aurn-7%3A3gpp-application.ims.iari.oma.evc.visual-ivr"

7.2.3.2   Service Media Specification - Request

This section describes the service media specification for EVC Client to request Visual IVR information, which is encapsulated within <visual-ivr-info-request>.

The element <visual-ivr-info-request> is the root EVC event element that appears under the <cpm-evfw> element as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework", and SHALL have the following structure:

- SHALL include one <call-correlation-info> element, as defined in section 7.1.1 "Format of Call Enhancements and Call Correlation";

- SHALL include one <visual-ivr-data> element containing the Visual IVR data that is being shared, which:

  o SHALL include one <CurrentWebURL> containing the URL of the current content presented to the EVC User. When the request is for receiving the first Visual IVR Menu, the value of <CurrentWebURL> element SHALL be set to NULL.

  o SHALL include one <input> element containing the EVC User input

    ▪ SHALL have a "type" attribute with the possible String values enumerated as follows:

      • "DTMFCode" - to indicate EVC User input is DTMF code

      • "NextWebURL" - to indicate EVC User input is URL of the Next Visual IVR Menu

      • "Text" - to indicate EVC User input is voice, converted to text

      • "NULL" – to indicate that the request is for the first Visual IVR Menu

See Appendix C.5.2 for an XML Example of Visual IVR Request.

7.2.3.3 First Visual IVR Menu

The high level flow corresponding to this scenario is depicted in Section Appendix C.5.2.1.

Upon receiving the request from the EVC User to place a Visual IVR call for retrieving the First Visual IVR Menu, the EVC Client SHALL generate a SIP INVITE request according to the rules and procedures of [CPM-CONV-TS], for CPM Session with the following clarifications:

In particular, the EVC Client:

1. SHALL set the Request-URI to the address of the target EVC User;

2. SHALL include an Accept-Contact header field with EVC IARI Feature Tag 'urn:urn-7:3gpp-application.ims.iari.oma.evc.visual-ivr' percent encoded in a g.3gpp.iari-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 "Coding of the IARI";

3. SHALL include the EVC User Address of the originating EVC Client that has been authenticated by the SIP/IP core, as authenticated originator's EVC address;

4. SHALL include in the User-Agent header field the OMA EVC release version of the EVC Client as specified in Appendix E "*Release Version in User-agent and Server headers*";

5. SHALL include a MIME SDP body as an SDP offer with the following clarification:

   a. SHALL set content type as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework";

6. SHALL send the SIP INVITE request towards the EVC Server according to the rules and procedures of the SIP/IP Core;

Upon successfully establishing the SIP session and MSRP media plane, the EVC Client:

1. SHALL populate MSRP SEND body as defined in section 7.2.3.2 "*Service Media Specification*" with the following additional clarifications:

   a. SHALL set the value of <CurrentWebURL> element as NULL;

   b. SHALL set the value of <input> element as NULL with the type= NULL;

2. SHALL generate and send one or more MSRP SEND requests on the established MSRP connection.

The established SIP/MSRP session SHALL be used for sharing Visual IVR request and responses throughout the duration of the call.

Upon receiving a MSRP SEND response from the EVC Server, the EVC Client:

1. SHALL check if there is a call corresponding to the elements of <call-correlation-info> and if the call is found then;

   a. SHALL check if there is a <output> element, with "type" attribute set to "NextWebURL" and process as follows;

      i. SHALL retrieve and present the contents from the URL specified in <output> element, along with the associated call;

   b. SHALL check if the type=CompleteMapping in <output> element and proceed as follows :

      i. SHALL cache the complete mapping information;

      ii. SHALL terminate the SIP session by sending a SIP BYE according to [CPM-CONV-TS];

   c. Otherwise, the EVC Client SHALL discard the received content;

2. If the associated call is not found, the EVC Client SHALL cache the enriched information and wait for the associated call. If the call is found before the timeout; EVC Client SHALL follow step 1, otherwise, on expiry of the timeout, EVC Client SHALL terminate the SIP session by sending a SIP BYE according to [CPM-CONV-TS].

When the call corresponding to the elements of <call-correlation-info> is ended, the EVC Client SHALL terminate the EVC session following the procedures defined in [CPM-CONV-TS].

7.2.3.4 Next Visual IVR Menu – DTMF Input

The high level flow corresponding to this scenario is depicted in Section Appendix C.5.2.2.

Upon receiving the DTMF input from the EVC User, the EVC Client:

1. SHALL check if there is a cached copy of complete mapping structure

   a. If available, the EVC Client SHALL present the contents from the URL specified in <NextWebURL> element corresponding to the <CurrentWebURL> element and EVC User's DTMF input, along with the associated call; Otherwise;

2. SHALL populate MSRP SEND body as defined in section 7.2.3.2 "*Service Media Specification*" with the following additional clarifications:

   a. SHALL set the value of <CurrentWebURL> element with Current Visual IVR Menu URL;

   b. SHALL set the value of <input> element with the user entered DTMF code and type="DTMFCode";

3. SHALL generate and send one or more MSRP SEND requests on the established MSRP connection.

Upon receiving a MSRP SEND response from the EVC Server, the EVC Client:

1. SHALL identify the call corresponding to the elements of <call-correlation-info> and if the call is found then;

   a. SHALL check if there is a <output> element, with "type" attribute set to "NextWebURL" and process as follows;

      i. SHALL retrieve and present the contents from the URL specified in <output> element, along with the associated call;

   b. Otherwise, the EVC Client SHALL discard the received content;

2. Otherwise, the EVC Client SHALL terminate the SIP session by sending a SIP BYE according to [CPM-CONV-TS].

When the call corresponding to the elements of <call-correlation-info> is ended, the EVC Client SHALL terminate the EVC session following the procedures defined in [CPM-CONV-TS].

7.2.3.5   Next Visual IVR Menu – Web Input

The high level flow corresponding to this scenario is depicted in Section Appendix C.5.2.3.

Upon receiving the Web input from the EVC User, the EVC Client:

1. SHALL present the contents from the URL corresponding to the EVC User's Web input, along with the associated call;

2. SHALL check if there is a cached copy of complete mapping structure

   a. If available, SHALL check the value of 'system-type' attribute of the <business> element and proceed as follows:

      i. SHALL retrieve the DTMF code from the <DTMFCode> corresponding to the value of Current Web URL and EVC User's Web input, if system-type=DTMFOnly or system-type=Hybrid and SHALL provide the DTMF code to the Call Handling Client;

      ii. SHALL retrieve the text from the <Text> corresponding to the value of Current Web URL and EVC User's Web input, if system-type=VoiceOnly and SHALL provide the voice, converted from text, to the Call Handling Client;

3. Otherwise, when the complete mapping structure is not available as cached copy, the EVC Client;

   a. SHALL populate MSRP SEND body as defined in section 7.2.3.2 "*Service Media Specification*" with the following additional clarifications:

      i. SHALL set the value of <CurrentWebURL> element with Current Visual IVR Menu URL;

      ii. SHALL set the value of <input> element with Next Visual IVR Menu URL and type= "NextWebURL";

   b. SHALL generate and send one or more MSRP SEND requests on the established MSRP connection.

Upon receiving a MSRP SEND response from the EVC Server, the EVC Client:

1. SHALL identify the call corresponding to the elements of <call-correlation-info> and if the call is found then;

   a. SHALL check if there is a <output> element, with "type" attribute set to "DTMFCode" and process as follows;

      i. SHALL retrieve the DTMF code specified in <output> element, and provide the DTMF code to the Call Handling Client; or

   b. SHALL check if there is a <output> element, with "type" attribute set to "text" and process as follows;

      i. SHALL retrieve the text specified in <output> element, and provide the voice converted from textto the Call Handling Client;

   c. Otherwise, the EVC Client SHALL discard the received content;

2. Otherwise, the EVC Client SHALL terminate the SIP session by sending a SIP BYE according to [CPM-CONV-TS].

When the call corresponding to the elements of <call-correlation-info> is ended, the EVC Client SHALL terminate the EVC session following the procedures defined in [CPM-CONV-TS].

7.2.3.6   Next Visual IVR Menu – Voice Input

The high level flow corresponding to this scenario is depicted in Section Appendix C.5.2.4.

Upon receiving the voice input from the EVC User, the EVC Client:

1. SHALL check if there is a cached copy of complete mapping structure

   a. If available, the EVC Client SHALL present the contents from the URL specified in <NextWebURL> element corresponding to the <CurrentWebURL> element and EVC User's voice input, along with the associated call; Otherwise;

2. SHALL populate MSRP SEND body as defined in section 7.2.3.2 "*Service Media Specification*" with the following additional clarifications:

   a. SHALL set the value of <CurrentWebURL> element with Current Visual IVR Menu URL;

   b. SHALL set the value of <input> element with the text converted from EVC User's voiceinput and type="Text";

3. SHALL generate and send one or more MSRP SEND requests on the established MSRP connection.

Upon receiving a MSRP SEND response from the EVC Server, the EVC Client:

1. SHALL identify the call corresponding to the elements of <call-correlation-info> and if the call is found then;

   a. SHALL check if there is a <output> element, with "type" attribute set to "NextWebURL" and process as follows;

      i. SHALL retrieve and present the contents from the URL specified in <output> element, along with the associated call;

   b. Otherwise, the EVC Client SHALL discard the received content;

2. Otherwise, the EVC Client SHALL terminate the SIP session by sending a SIP BYE according to [CPM-CONV-TS].

When the call corresponding to the elements of <call-correlation-info> is ended, the EVC Client SHALL terminate the EVC session following the procedures defined in [CPM-CONV-TS].

7.3 Procedures at EVC Server

7.3.1 Subscription to Registration Event Information

7.3.1.1 Subscribe Registration Event Information Notifications

The EVC Server SHALL support receiving 3rd party registration from the SIP/IP core according to [3GPP TS 24.229] clause 5.4.1.7.

If the EVC Server is not already subscribed to the "reg" event package as specified in [RFC3680] for the EVC User Address as received in the SIP REGISTER request, the EVC Server:

1. SHALL generate a SIP SUBSCRIBE request according to the rules and procedures of [RFC3265] and [RFC3680];

2. SHALL set the Request-URI of the SIP SUBSCRIBE request to the EVC User Address as received in the SIP REGISTER request;

3. MAY set an expiration timer in Expires header with a value according to the rules and procedures of [RFC3903], in the same range as the registration timer recommendations for the SIP/IP core;

4. SHALL send the SUBSCRIBE request according to the rules and procedures of the SIP/IP core.

When receiving the SIP 200 "OK" response from the SIP/IP core, the EVC Server SHALL wait for and receive the Registration Event Information Notifications from the SIP/IP core.

The responses to the SIP SUBSCRIBE request SHALL be handled according to the rules and procedures of [RFC3265] and [RFC3680], and rules and procedures of the SIP/IP core.

NOTE: The EVC Server MAY terminate the subscription at any time, according to the rules and procedures of [RFC3265] and [RFC3680].

7.3.1.2 Receive Registration Event Information Notifications

Upon receiving a SIP NOTIFY request as the result of the "reg" event subscription, containing the Registration Event Information as specified in [RFC3680] and [RFC5628], the EVC Server processes the Registration Event Information and SHALL generate and send a SIP 200 "OK" response to the SIP/IP core, according to the rules and procedures of [RFC3265] and [RFC3680], and SIP/IP core.

7.3.2 EVC Call Enhancements

7.3.2.1 Person to Person Call

Upon receiving a SIP INVITE request with the EVC IARI Feature Tag 'urn:urn-7:3gpp-application.ims.iari.oma.evc' included in the Accept-Contact header, the EVC Server:

1. SHALL check whether the authenticated originator's EVC Address is of a EVC User who is allowed to send the request and if not, the EVC Server SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261];

2. SHALL act as a SIP Proxy and not insert itself in the media path;

3. SHALL duplicate and forward the SIP INVITE request according to the rules and procedures of [RFC3261] to each of the terminating EVC User's EVC Client(s).

Upon receiving a SIP 200 "OK" response to the SIP INVITE request from the terminating side, the EVC Server SHALL forward the SIP 200 "OK" response to the originating EVC Client. In this case, if the terminating EVC User has multiple registered EVC Clients, the EVC Server MAY send SIP CANCEL request to each of the user's other registered EVC Clients to notify them to ignore the previous request mentioned above.

Upon receiving a SIP BYE request, the EVC Server SHALL handle it as described in [RFC3261].

NOTE: The EVC User may have multiple registered devices hosting EVC Client individually. If so, the EVC Server SHOULD duplicate and forward the SIP INVITE request mentioned above to each of the registered EVC Clients.

7.3.2.2 Business to Client

The same procedures as described in Section 7.3.2.1 Person to Person Call SHALL be applied.

7.3.2.3 Web + Call

The same procedures as described in Section 7.3.2.1 Person to Person Call SHALL be applied.

7.3.2.4 Real-time Message

EVC Server is not involved in the Real-time text signalling and media handling.

7.3.3 EVC Visual IVR

7.3.3.1 Service Media Specification - Response

This section describes the service media specification for EVC Server responding with Visual IVR information encapsulated within <visual-ivr-info-response>.

The element<visual-ivr-info-response> is the root EVC event element that appears under the <cpm-evfw> element as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework", and:

- SHALL include one <call-correlation-info> element, as defined in section 7.1.1 "Format of Call Enhancements and Call Correlation";

- SHALL include one <visual-ivr-data> element containing the Visual IVR data that is being shared, which:

  o SHALL include one <output> element containing the mapping information

    ▪ SHALL have a "type" attribute with the possible values as:

      • "CompleteMapping" – to indicate the output value included is complete mapping structure

      • "NextWebURL" – to indicate the output value included is URL corresponding to Next Visual IVR Menu

- "DTMFCode" – to indicate the output value included is DTMF code corresponding to Next Visual IVR Menu

- "Text" – to indicate the output value included is Text corresponding to Next Visual IVR Menu

See Appendix C.5.2 for an XML Example of Visual IVR Response.

7.3.3.2   Server Procedures

Upon receiving a SIP INVITE request with the EVC IARI Feature Tag 'urn:urn-7:3gpp-application.ims.iari.oma.evc.visual-ivr' included in the Accept-Contact header, the EVC Server:

1. SHALL check whether the authenticated originator's EVC Address is of a EVC User who is allowed to send the request and if not, the EVC Server SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261]; Otherwise,

2. SHALL generate and send a SIP 200 "OK" response to the received initial SIP INVITE request according to the rules and procedures of [CPM-CONV-TS] with the following clarifications:

    a. The EVC Server SHALL include in the Server header the OMA EVC release version of the EVC Server as specified in Appendix E "*Release Version in User-agent and Server headers*".

Upon receiving a SIP ACK request, the EVC Server:

1. SHALL handle the SIP ACK request according to the rules and procedures of [RFC3261];

2. SHALL establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to [RFC4975];

Upon receiving an MSRP request, the EVC Server:

1. SHALL check if there is a <visual-ivr-data> element, and process as follows:

    a. SHALL check if the <CurrentWebURL> element and the <input> element are NULL and proceed as follows:

        i. SHALL check the 'dynamic' attribute of the <business> element, and:

            1. SHALL retrieve complete mapping information as described in the Section 5.1.13 Search Capabilities of EVC Visual IVR Mapping Application Usage, if the 'dynamic' attribute is set to 'FALSE'. Otherwise,

            2. SHALL retrieve the URL for the First Visual IVR Menu from the <NextWebURL> element as described in the Section 5.1.13 Search Capabilities of EVC Visual IVR Mapping Application Usage.

    b. SHALL check <input> element type if <CurrentWebURL> and <input> are not NULL and proceed as follows:

        i. SHALL retrieve the URL for the Next Visual IVR Menu from the <NextWebURL> element as described in the Section 5.1.13 Search Capabilities of EVC Visual IVR Mapping Application Usage corresponding to the values of <CurrentWebURL> and <input>, if type = DTMFCode or type=Text in the received <input> element;

        ii. SHALL check the value of 'system-type' attribute of the <business> element if type = NextWebURL in the received <input> element, and proceed as follows:

            1. SHALL retrieve the DTMF code from the <DTMFCode> as described in the Section 5.1.13 Search Capabilities of EVC Visual IVR Mapping Application Usage corresponding to the value of <CurrentWebURL> and <input>, if system-type=DTMFOnly or system-type=Hybrid.

2. SHALL retrieve the Text from the <Text> as described in the Section 5.1.13 Search Capabilities of EVC Visual IVR Mapping Application Usage corresponding to the value of <CurrentWebURL> and <input>, if system-type=VoiceOnly;

2. SHALL populate MSRP SEND body as defined in section 7.3.3.1 "*Service Media Specification*" with the following additional clarifications:

    a. SHALL include the <output> element with value (retrieved in the above Step 1) and set the:

        i. type=CompleteMapping, if EVC Server is returning the complete mapping structure.

        ii. type=NextWebURL, if EVC Server is returning the First Visual IVR Menu URL or the Next Visual IVR Menu URL

        iii. type=DTMFCode, if EVC Server is returning the DTMF Code.

        iv. type=Text, if EVC Server is returning the Text value.

3. SHALL generate one or more MSRP SEND requests (depending on whether chunking is used) according to the rules and procedures of [RFC4975] and the following additional clarifications. The EVC Server:

    a. SHALL set To-Path header according to the MSRP URI(s) received in the SDP offer.

4. SHALL send the MSRP SEND requests(s) on the established MSRP connection

Upon receiving a SIP CANCEL request, the EVC Server SHALL handle the request according to the rules and procedures of [RFC3261].

Upon receiving a SIP BYE request from the EVC User, EVC Server SHALL respond to the SIP BYE request as described in [RFC3261].

7.4   Procedures at SIP/IP Core

7.4.1   Registration of EVC Client

Upon receiving the SIP registration request from an EVC Client, the SIP/IP core, according to [RFC3261]:

- Authenticates the EVC User;

- Binds an EVC User address and one or more Unique User Agent Identifiers;

- Returns the complete list of bindings of that EVC User address in the response to the registration, if successful;

- Returns both a public GRUU and a temporary GRUU associated with the device of the EVC Client according to [RFC5627];

- Keeps the binding information (e.g. EVC User address, Unique User Agent Identifier, expiration time, EVC Client capabilities, temporary GRUU) until de-registration is performed for each Unique User Agent Identifier bound to the EVC User address

When the SIP/IP core corresponds with 3GPP/3GPP2 IMS then it is possible that the SIP/IP core informs the EVC Client about additional implicitly registered EVC User addresses in the SIP registration response.

The SIP/IP core provides an SIP authentication framework as defined in [RFC3261] to authenticate the EVC User. When the SIP/IP core corresponds with 3GPP/3GPP2, then the EVC Client SHALL consider EVC variants according to [3GPP TS33.178] and determine the appropriate authentication scheme according to [3GPP TS33.203] / [3GPP2 S.R0086-0] and [3GPP TS33.178].

The SIP/IP core assigns, during client registration, a unique globally routable user agent URI to the device hosting the EVC Client and returns this GRUU in the registration response as specified in [RFC5627]. The GRUU allows the EVC Enabler to uniquely address each EVC Client residing on a different device.

NOTE: An EVC Client is uniquely identified by a Unique User Agent Identifier, which SHALL be in the form of UUID URN as specified in [RFC4122]. A Unique User Agent Identifier distinguishes the EVC Client on a Device from other EVC Clients on other Devices used by the same EVC User.

NOTE: The EVC User Address identifies the EVC User uniquely. An EVC User Address SHALL be in the format of a SIP URI (specified in [RFC3261]) or a TEL URI (specified in [RFC 3966]).

7.4.2   Subscription to Registration Event Information

Upon receiving the SIP SUBSCRIBE request from an EVC Server with the "reg" event package, the SIP/IP core, according

to the rules and procedures of [RFC3265] and [RFC3680]:

- Authenticates the EVC Server;

- If the request is registration, keeps the request information for hence sending relevant Registration Event Information of EVC Clients to the EVC Server;

- If the request is cancellation to existed registration, removes the relevant registration information and cancels to continue to send Registration Event Information;

- If supporting to the request, sends SIP 200 "OK" response to the EVC Server, else sends relevant SIP response with related error information.

When an EVC Server subscribes the Registration Event Information of the EVC Clients, the SIP/IP Core SHOULD continually collect and forward the registration information of the EVC Clients to the EVC Server, Registration Event Information Notification, according to the rules and procedures of [RFC3265] and [RFC3680]. The response information contains the information of the registered EVC Client and the corresponding EVC User, including EVC Client Identifier, EVC User Identifier, device capabilities, etc.

8. Release Information

8.1 Supporting File Document Listing

Doc Ref	Permanent Document Reference	Description
Supporting Files		
[XSD_EVC_EnrichedInfo]	OMA-SUP-XSD_EVC_EnrichedInfo-V1_0-20150602-C	EVC Enriched Info Document, version - 1.0 File: OMA-SUP-XSD_EVC_EnrichedInfo-V1_0-20150602-C Type: Text - Schema Description Path: http://www.openmobilealliance.org/tech/profiles Name: EVC_EnrichedInfo-V1_0.xsd
[XSD_EVC_VisualIVRInfoReq]	OMA-SUP-XSD_EVC_VisualIVRInfoReq-V1_0-20150602-C	EVC Visual IVR Request Document, version - 1.0 File: OMA-SUP-XSD_EVC_VisualIVRInfoReq-V1_0-20150602-C Type: Text - Schema Description Path: http://www.openmobilealliance.org/tech/profiles Name: EVC_VisualIVRRequest-V1_0.xsd
[XSD_EVC_VisualIVRInfoRes]	OMA-SUP-XSD_EVC_VisualIVRInfoRes-V1_0-20150602-C	EVC Visual IVR Response Document, version - 1.0 File: OMA-SUP-XSD_EVC_VisualIVRInfoRes-V1_0-20150602-C Type: Text - Schema Description Path: http://www.openmobilealliance.org/tech/profiles Name: EVC_VisualIVRResponse-V1_0.xsd
[XSD_EVC_VisualIVRMapping]	OMA-SUP-XSD_VisualIVRMapping-V1_0-20150602-C	EVC Visual IVR Mapping Document, version - 1.0 File: OMA-SUP-XSD_EVC_VisualIVRMapping-V1_0-20150602-C Type: Text - Schema Description Path: http://www.openmobilealliance.org/tech/profiles Name: EVC_VisualIVRMapping-V1_0.xsd

Table 20: Listing of Supporting Documents in EVC Release

8.2 OMNA Considerations

None.

8.3 Additional Items

None.

Appendix A.   Change History   (Informative)

A.1   Approved Version History

Reference	Date	Description
n/a	n/a	No prior version

A.2   Draft/Candidate Version 1.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-ER-EVC-V1_0	11 Apr 2014	All	First version initiated
	05 May 2014	5.1, B.1	Added two new requirements, HLF-001 and HLF-002, and added a new use case "call visual information", based on CR#2014-0002R02.
		5.1, 5.7, B.2	Added two new requirements HLF-003 and USA-001, and added a new use case "information sync", based on CR#2014-0003R02.
		5.2, 5.3, B.3	Added three new requirements COM-001 and PMG-001 and PMG-002, and added a new use case "interactive visual information", based on CR#2014-0004R02.
		5.4	Added a new requirement PRO-001, based on CR#2014-0005R01. Added a new requirement PRO-002, based on CR#2014-0006R01.
		5.5	Added a new requirement CTS-001, based on CR#2014-0007R01.
		5.6	Added two new requirements MDS-001 and MDS-002, based on CR#2014-0011R01.
	13 Jun 2014	5.6	Added one new requirement MDS-003, based on CR#2014-0015R01. Added one new requirement MDS-004, based on CR#2014-0022R01.
		B.4	Added a new use case "Multiple Device Supports", based on CR#2014-0016R01.
		5.4	Added one new requirement PRO-004, based on CR#2014-0017R01. Added one new requirement PRO-003, based on CR#2014-0018R01. Added one new requirement PRO-005, based on CR#2014-0025R01. Updated requirements PRO-001 and PRO-002, and added two new requirements PRO-006 and PRO-007, based on CR#2014-0026R01. Added one new requirement PRO-008, based on CR#2014-0030R01.
		5.2	Added two new requirements COM-002 and COM-003, based on CR#2014-0019R01.
		5.1, 5.5	Added four new requirements HLF-004 and HLF-005, and CTS-003 and CTS-004, based on CR#2014-0020R01.
		5.8	Added new section, section 5.8, and added one new requirement IWG-001, based on CR#2014-0021R01.
		5.1	Added two new requirements HLF-006 and HLF-007, based on CR#2014-0027R02. Added two new requirements HLF-008 and HLF-009, based on CR#2014-0044R01. Added two new requirements HLF-010 and HLF-011, based on CR#2014-0045R01.
		5.5	Updated requirement CTS-001, and added one new requirement CTS-002, based on CR#2014-0028R02.
		5.9	Added new section, section 5.9, and added two new requirements SOC-001 and SOC-002, based on CR#2014-0031R02.
		5.2, 5.7	Added two new requirements COM-004 and USA-002, based on CR#2014-0032R01.
		5.1.1	Added new section, section 5.1.1, and added four new requirements SEC-001 thru SEC-004, based on CR#2014-0033R01.
		5.1.1.1	Added new section, section 5.1.1.1, and added four new requirements AUC-001 thru AUC-004, based on CR#2014-0034.
		5.1.1.2	Added new section, section 5.1.1.2, and added five new requirements AUT-001 thru AUT-005, based on CR#2014-0035.
		5.1.1.3	Added new section, section 5.1.1.3, and added one new requirement INT-001, based on CR#2014-0036.

Document Identifier	Date	Sections	Description
		5.1.1.4	Added new section, section 5.1.1.4, and added one new requirement CON-001, based on CR#2014-0037.
		5.1.2	Added new section, section 5.1.2, and added one new requirement CHG-001, based on CR#2014-0038.
		5.1.3	Added new section, section 5.1.3, and added one new requirement ADM-001, based on CR#2014-0039.
		5.1.4	Added new section, section 5.1.4, and added one new requirement IOP-001, based on CR#2014-0040R01.
		5.1.5 2.2	Added new section, section 5.1.5, and added one new requirement PRV-001, and added one reference in section 2.2, based on CR#2014-0041R01.
		5.1.6	Added new section, section 5.1.6, and added one new requirement IWG-001, based on CR#2014-0042R01.
		5.10	Added new section, section 5.10, and added one new requirement OSR-001, based on CR#2014-0043R01.
		5	Editorial changes.
	29 Aug 2014	5.1	Added a new requirement, HLF-0012, based on CR#2014-0046R01.
		5.2	Added a new requirement, COM-0005, based on CR#2014-0047R01.
		5.4	Added three new requirements, PRO-009 to PRO-011, based on CR#2014-0048R01.
		5.8	Added two new requirements, IWG-002 and IWG-003, based on CR#2014-0049R02.
		5.4, 5.9	Added four new requirements, PRO-012, PRO-013, SOC-003 and SOC-004, based on CR#2014-0050R01.
		B	Added new descriptions for actors and their roles, based on CR#2014-0054R02.
		5.6	Updated two requirements, MDS-001 and MDS-002, based on CR#2014-0055.
		5, B	Editorial changes.
	13 Nov 2014	All New added Appdendix C	List of CRs incorporated: 1. OMA-COM-EVC-2014-0052R05-CR_AD_Dependency 2. OMA-COM-EVC-2014-0053R05-CR_AD_Architecture_Diagram 3. OMA-COM-EVC-2014-0056R03-CR_AD_Architecture_Diagram_Description 4. OMA-COM-EVC-2014-0068R02-CR_AD_EVC_Architecture_Scenarios 5. OMA-COM-EVC-2014-0072R03-CR_AD_Flow_Enhanced_Business_Call 6. OMA-COM-EVC-2014-0078R01-CR_RD_Clarify_Call_Type_in_EVC_Environment 7. OMA-COM-EVC-2014-0082R01-CR_EVC_Phasing_Requirements

Document Identifier	Date	Sections	Description
	25 Dec 2014	All	List of CRs Incorporated; 1. OMA-COM-EVC-2014-0076R03-CR_AD_Flow_Multiple_Device_Supports 2. OMA-COM-EVC-2014-0080R04-CR_High_Level_Flow_for_Web+IVR_Setup_Scenario 3. OMA-COM-EVC-2014-0088R03-CR_Scope 4. OMA-COM-EVC-2014-0089R02-CR_Introduction 5. OMA-COM-EVC-2014-0090R02-CR_Version 6. OMA-COM-EVC-2014-0093R02-CR_High_Level_Flow_for_Web+Call_Scenario 7. OMA-COM-EVC-2014-0094R01-CR_AD_Flow_Call_Enhancements_P2P_Call 8. OMA-COM-EVC-2014-0095R01-CR_AD_Ext_Func_Comp_SIPIPCore 9. OMA-COM-EVC-2014-0096R01-CR_AD_Ext_Func_Comp_CPM_XDM_CAB 10. OMA-COM-EVC-2014-0097R01-CR_AD_Ext_Func_Comp_PRS_DM 11. OMA-COM-EVC-2014-0098-CR_AD_Ext_Func_Comp_Remote_Environment 12. OMA-COM-EVC-2014-0099R01-CR_AD_Interface_1_2 13. OMA-COM-EVC-2014-0100R01-CR_A003_Restructuring_RD 14. OMA-COM-EVC-2014-0101R01-CR_AD_Flow_IVR_Next_Menu_DTMF_Input 15. OMA-COM-EVC-2014-0102R01-CR_AD_Flow_IVR_Next_Menu_Web_Input 16. OMA-COM-EVC-2014-0103R01-CR_AD_Flow_IVR_Next_Menu_Voice_Input 17. OMA-COM-EVC-2014-0104R01-CR_Flow_of_IVR_Next_Menu_DTMF_Input_with_Content_Push 18. OMA-COM-EVC-2014-0105R01-CR_Skeleton_of_Section_6.3 19. OMA-COM-EVC-2014-0107R01-CR_AD_Flow_Call_Enhancements_RTM_Accept 20. OMA-COM-EVC-2014-0108R01-CR_AD_Flow_Call_Enhancements_RTM_Reject 21. OMA-COM-EVC-2014-0112R01-CR_AD_EVC_Functional_Components
	20 Jan 2015	Section 7	OMA-COM-EVC-2015-0001-CR_TS_Skeleton_for_Section_7
	03 Feb 2015	Section 7.1.1	1. OMA-COM-EVC-2015-0002R02-CR_TS_7.1.1_Format_Call_Enhancements_and_Call_Correlation
		Section 7.2.2.1	2. OMA-COM-EVC-2015-0003R01-CR_TS_7.2.2.1_Call_Enhancements_Service_Discovery_Specification
		Section 7.2.2.2, Section 7.3.1.1	3. OMA-COM-EVC-2015-0004R01-CR_7.2.2.2_Person_to_Person_Call
		Section 7.2.2.4.1, Appendix C.4.3	4. OMA-COM-EVC-2015-0010R03-CR_TS_7.2.2.4.1_Web+Call_Service_Media_Specification
		Section 7.2.2.4 Section 7.3.1.3	5. OMA-COM-EVC-2015-0011R01-CR_TS_7.2.2.4_Web+Call

Document Identifier	Date	Sections	Description
		Section 7.2.3.1 Section 7.2.3.2 Section 7.3.2.1 Appendix C.5.2	6. OMA-COM-EVC-2015-0012R02-CR_TS_Visual_IVR_Service_Discovery_and_Media_Spec
		Section 7.2.3.3	7. OMA-COM-EVC-2015-0013R01-CR_TS_CR_7_2_3_3_First_Visual_IVR_Menu
		Section 7.2.3.4	8. OMA-COM-EVC-2015-0014R01-CR_TS_7_2_3_4_Next_Visual_IVR_Menu_DTMF_Input
		Section 7.2.3.5	9. OMA-COM-EVC-2015-0015R01-CR_TS_7_2_3_5_Next_Visual_IVR_Menu_Web_Input
		Section 7.2.3.6	10. OMA-COM-EVC-2015-0016R01-CR_TS_7_2_3_6_Next_Visual_IVR_Menu_Voice_Input
		Section 7.3.2.2	11. OMA-COM-EVC-2015-0017R01-CR_TS_7_3_2_2_Server_Procedures
		Section 6.2	12. OMA-COM-EVC-2015-0020R01-CR_Remove_Interface_XDM_3i_in_AD_Diagram
		Section 6.3.2.3.1 Section 6.3.2.3.2	13. OMA-COM-EVC-2015-0021R01-CR_Add_Description_of_Interface_XDM_4i
		Appendix C.7	14. OMA-COM-EVC-2015-0022-CR_Add_Description_of_RTM_to_Call_Invitation_Scenario
		Section 6.3.1.4.9.1 Section 6.3.1.4.9.2	15. OMA-COM-EVC-2015-0025R01-CR_Add_Description_of_External_Content_Servers
		Appendix C.2.1 Appendix C.3.1	16. OMA-COM-EVC-2015-0026R01-CR_Add_Description_of_Scenario_Flow_in_Section_C.2_and_C.3
		Appendix C.6	17. OMA-COM-EVC-2015-0027R02-CR_Add_Description_of_Interactive_Web+Call_Scenario
	11 Feb 2015	Section 7.2.3.3 Section 7.2.3.4 Section 7.2.3.5 Section 7.2.3.6 Section 7.3.2.1 Section 7.3.2.2	OMA-COM-EVC-2015-0028-CR_Retrieving_Complete_Mapping
		Section 7.2.2.5 Section 7.3.1.4	OMA-COM-EVC-2015-0029-CR_TS_7_2_2_5_Real_time_Message
	24 Mar 2015	Appendix C.7 Appendix C.7.2.1 Appendix C.7.2.2	OMA-COM-EVC-2015-0037R01-CR_CONRR_ER_Comments_from_A0119_to_A0122
		Section 6.3.2.1	OMA-COM-EVC-2015-0039R01-CR_CONRR_ER_Comment_A044
		Section 6.3.2.3.2	OMA-COM-EVC-2015-0040R01-CR_CONRR_ER_Comment_A050

Document Identifier	Date	Sections	Description
		Section 7.2.2.2.2 Section 7.2.2.2.3 Section 7.2.2.4.2 Section 7.2.2.4.3 Section 7.2.2.5.2 Section 7.2.2.5.3 Section 7.2.3.3 Section 7.3.1.1 Section 7.3.1.4 Section 7.3.2.2	OMA-COM-EVC-2015-0041-CR_CONRR_ER_Comment_A068_A071_A077_A080_A086_A094_A096_A097
		Section 7.3.2.2	OMA-COM-EVC-2015-0042-CR_CONRR_ER_Comment_A099
		Appendix C.5.2.2 Appendix C.5.2.3 Appendix C.5.2.4 Appendix C.5.2.5	OMA-COM-EVC-2015-0043-CR_CONRR_ER_Comment_A0114_A0115_A0116_A0117
		Appendix C.5.2.1 Appendix C.5.2.2 Appendix C.5.2.3 Appendix C.5.2.4	OMA-COM-EVC-2015-0044-CR_CONRR_ER_Comment_A0109

Document Identifier	Date	Sections	Description
		Section 6.3.1.2 Section 6.3.1.4.9 Section 6.3.2.2 Section 7.2.2.2.2 Section 7.2.2.4.2 Section 7.2.2.5.3 Section 7.2.3.3 Section 7.2.2.2.3 Section 7.2.2.4.3 Section 7.2.3.3 Section 7.2.2.4.2 Section 7.2.2.5.2 Section 7.2.3.1 Appendix C.2.1 Appendix C.2.2	OMA-COM-EVC-2015-0045-CR_CONRR_ER_Editorial_Fixes
		Section 7.1.1	OMA-COM-EVC-2015-0046-CR_CONRR_ER_Comment_A057_A058_A061_A062_A063_A064
		Section 7.2.3.2	OMA-COM-EVC-2015-0047-CR_CONRR_ER_Comment_A083_A084_A085
		Section 7.2.3.5	OMA-COM-EVC-2015-0048-CR_CONRR_ER_Comment_A088_A089
		Section 7.3.1.1 Section 7.3.1.4 Section 7.3.2.2	OMA-COM-EVC-2015-0049-CR_CONRR_ER_Comment_A098_A0100
		Appendix C5.2.2 Appendix C.5.2.4 Appendix C.5.2.4 Appendix C.5.2.5	OMA-COM-EVC-2015-0050-CR_CONRR_ER_Comment_A0110_A0111_A0112_A0113
	28 Apr 2015	Section 7.2.3.6	OMA-COM-EVC-2015-0052R01-CR_CONRR_ER_Comment_A090
		Section 7.2.3.4 Section 7.2.3.5 Section 7.2.3.6	OMA-COM-EVC-2015-0053R01-CR_CONRR_ER_Comment_A091
		Section 6.3.2.1 Section 6.3.2.2	OMA-COM-EVC-2015-0054R01-CR_CONRR_ER_Comments_A045_A046

Document Identifier	Date	Sections	Description
		Appendix C.4 Appendix C.5 Appendix C.5.2.1 Appendix C.6	OMA-COM-EVC-2015-0055R01-CR_CONRR_ER_Editorial_Fixes_part2
		Section 2.1 Section 6.1	OMA-COM-EVC-2015-0064R01-CR_CONRR_ER_Comments_A030_A031
		Section 7.2 Section 7.2.2.3 Section 7.3 Section 7.3.1.2 Appendix C.2	OMA-COM-EVC-2015-0065-CR_CONRR_ER_Comment_A066_A069_A073_A092_A093_A095_A103
		Section 6.3.1.4.8 Section 6.3.1.4.10 Section 6.3.1.4.11	OMA-COM-EVC-2015-0066R01-CR_CR_CONRR_ER_Comment_A038_A041_A043
		Section 7.3.2.2	OMA-COM-EVC-2015-0067-CR_CONRR_COMMENT_B012
		Section 5.1 Section 5.5	OMA-COM-EVC-2015-0068R01-CR_CONRR_ER_Comment_A026_A028
		None	OMA-COM-EVC-2015-0070-CR_CONRR_ER_Comment_A060
		Section 7.2.2.4.2	OMA-COM-EVC-2015-0071-CR_CR_CONRR_ER_Comment_A074
		Section 7.2.1	OMA-COM-EVC-2015-0072-CR_CONRR_ER_Procedure_Registration_Client_Side
		Section 7	OMA-COM-EVC-2015-0073-CR_CONRR_ER_Procedure_Registration_Server_Side
		Section 7.4	OMA-COM-EVC-2015-0074-CR_CONRR_ER_Procedure_Registration_SIPIP
		Section 2.2 Section 6.1 Section 6.2 Section 6.3.1.4.4	OMA-COM-EVC-2015-0077R01-CR_CONRR_ER_Comment_A005
		Section 4 Section 4.1	OMA-COM-EVC-2015-0078-CR_CONRR_ER_Comment_A011_A012
		Section 5.1	OMA-COM-EVC-2015-0081-CR_ER_Comment_A014
		Section 5	OMA-COM-EVC-2015-0082R01-CR_CONRR_ER_Comment_A013
		Section 2.1 Section 6.3.1.3	OMA-COM-EVC-2015-0083-CR_CONRR_ER_Comment_A036_A037
		Section 6.3.2.3.1 Section 6.3.2.3.2	OMA-COM-EVC-2015-0084-CR_CONRR_ER_Comment_A048_A049
		Section 7.1	OMA-COM-EVC-2015-0085-CR_CONRR_ER_Comment_A055
		Section 7.2.2.2.3 Section 7.2.2.4.3 Section 7.2.3.3	OMA-COM-EVC-2015-0086-CR_CONRR_ER_Comment_A059
		All Sections	OMA-COM-EVC-2015-0088-CR_Comment_A004_A006_A029

Document Identifier	Date	Sections	Description
	24 May 2015	Section 7.2.2.2.3	OMA-COM-EVC-2015-0075R02-CR_CONRR_ER_Procedure_Multiple_Device_Support_Client_Side
		Section 5.7 Section 7.3.1.1	OMA-COM-EVC-2015-0076R02-CR_CONRR_ER_Procedure_Multiple_Device_Support_Server_Side
		Section 6.3.1.4.6 Section 8.1	OMA-COM-EVC-2015-0089-CR_CONRR_ER_A039
		Section 2.1	OMA-COM-EVC-2015-0091-CR_CONRR_ER_References
		Appendix C.1.3 Appendix C.4.3 Appendix C.5.2	OMA-COM-EVC-2015-0096R01-CR_CONRR_ER_Comment_A002
		Section 7	OMA-COM-EVC-2015-0104-CR_Comment_A051_A052_A087
		Appendix C.3	OMA-COM-EVC-2015-0108-CR_CONRR_ER_Procedure_Multiple_Device_Support_Procedure
		Section 7 Section 8	OMA-COM-EVC-2015-0112-CR_CONRR_ER_Comment_A0101_A065
		Section 2 Section 3	OMA-COM-EVC-2015-0117-CR_CR_CONRR_ER_Comment_A003_A007_A008_A009_A010_A017
		None	OMA-COM-EVC-2015-0119-INP_CONRR_ER_Comment_A033_A034
		Appendix D	OMA-COM-EVC-2015-0113R01-CR_CONRR_ER_Comment_A0123_Client
		Appendix D	OMA-COM-EVC-2015-0115-CR_CONRR_ER_Comment_A0123_Server
		Section 7.2.2.3.3	OMA-COM-EVC-2015-0122-CR_CONRR_ER_Procedure_Multiple_Device_Support_in_B2C
		All	OMA-COM-EVC-2015-0123-CR_CONRR_ER_Comment_A001
		Appendix B	OMA-COM-EVC-2015-0127-CR_CONRR_ER_Comment_A0102
		Section 5.1	OMA-COM-EVC-2015-0130R01-CR_CONRR_ER_Remaining_Comments
		Section 5.1 Section 7.2.2.5	OMA-COM-EVC-2015-0134R01-CR_CONRR_ER_COMMENT_A020_A021_A022_A076
		Section 2.1 Section 6.2 Section 7 Appendix C.1.3	OMA-COM-EVC-2015-0135R01-CR_CONRR_ER_COMMENT_A067
Candidate Version OMA-ER-EVC-V1_0	02 Jun 2015	n/a	Status changed to Candidate by TP TP Ref # OMA-TP-2015-0092-INP_EVC_V1_0_ERP_and_ETR_for_Candidate_approval

Appendix B.   Use Cases   (Informative)

The EVC users include individual users and business users (e.g. yellow page service providers). The EVC users can share their visual/audio/ content information as associated with call. The individual EVC User can share his/her information as stored in network repository (e.g. SNS) to other EVC users (individual and business) via EVC-enabled service. And the business EVC users can forward their information (e.g. yellow page) to individual EVC users via EVC-enabled service. And more, the individual EVC user can select options from menu provided by business EVC user to place a call, manage their preferences (including profiles and permissions), and establish social interactions with other EVC users. The following figure shows the actors and their roles for the EVC Enabler.
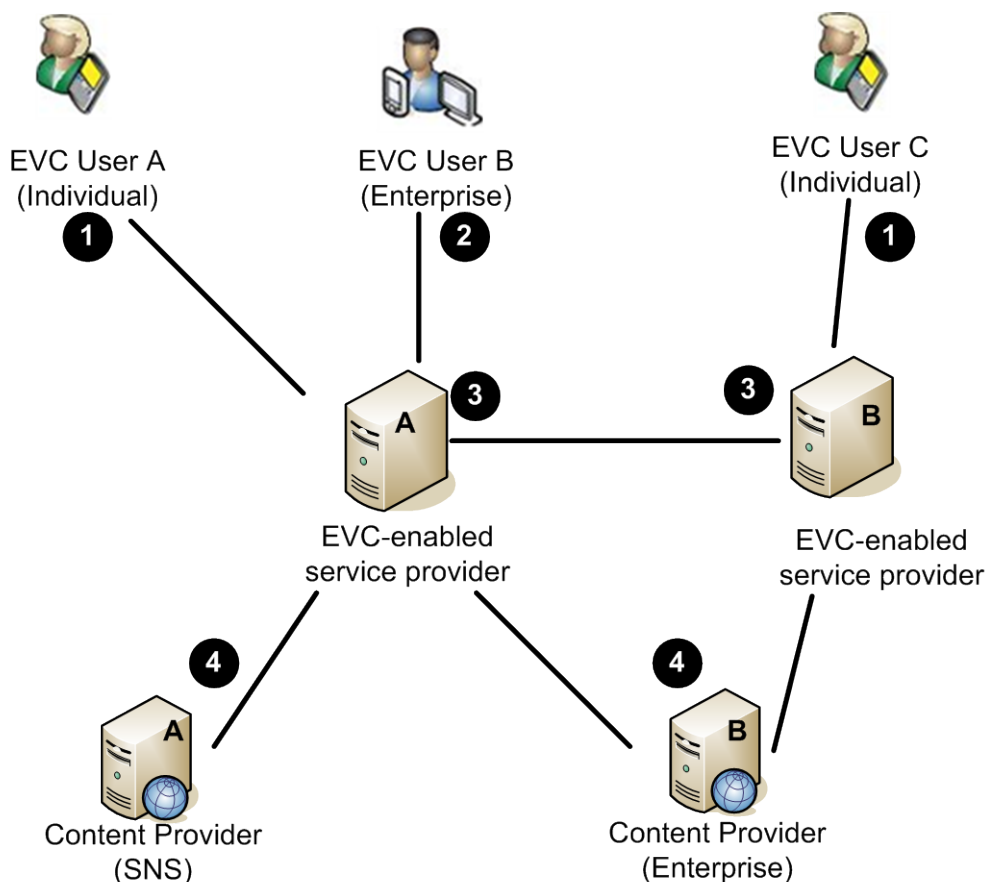
① ② EVC User - uses EVC-Enabled service in his/her home domain

③ EVC-enabled service provider - offers EVC-enabled services to its subscribers

④ Content Provider - offers contents to EVC Users via EVC-enabled service provider

Figure 2: Actors and Roles

B.1   Call Visual Information

This use case is about providing visual information related to the call (prior to placing a call, while placing a call, while already on a call) to the EVC user and where EVC user can respond with his/her selection

B.1.1   Short Description

The EVC user, using one of his devices, searches for the visual information available related to a call he/she would like to make. For e.g., EVC user can receive the pizza menu as visual information prior to making a call to the pizza delivery store. Once the EVC user has decided the pizza item(s) to be asked for delivery, he/she places a call to the pizza delivery store including the information about the selected pizza item(s). The pizza delivery store may send the confirmation of the order to the EVC user.

Alternately, the EVC user places a call to the pizza delivery store and receives pizza menu as the visual information before EVC user gets connected to the store representative. EVC user has an option of connecting to the store representative while or after deciding on the pizza item(s) to be asked for delivery. The pizza delivery store may send the confirmation of the order to the EVC user.

Alternatively, the EVC user is on a call with pizza deliver store representative. During the call, the EVC user requests to show the visual information e.g., pizza menu. EVC user then indicates the selected pizza item(s) to the pizza deliver store. The pizza delivery store may send the confirmation of the order to the EVC user.

B.1.2   Market benefits

EVC user benefits from ease of receiving call related information in visual form without having to switch between multiple interfaces. EVC user also benefits from additional visual information available to indicate precise decision compared to any error happening when only voice communication is used. Service Provider benefits from encouraged usage of both voice and data by its customers. Businesses benefit from easy and quick handling of requests from its customers.

B.2   Information Sync

This use case is about synchronization of audio and visual information related to the call.

B.2.1   Short Description

Pre-condition: EVC user has received audio/visual information from the pizza store, e.g., 1. Place the order, 2. Track the order, 3. File a complaint etc.

The EVC user, who is consuming the audio/visual information from the pizza store, selects the subsequent action he/she is interested in through web page click. EVC user then receives next set of audio and visual information in a synchronized manner.

Alternately, the EVC user can select the subsequent action through any other interface apart from web page click e.g., IVR, DTMF.

B.2.2   Market benefits

EVC user benefits from having multiple forms of information simultaneously. EVC user also benefits from multiple options (flexibility) in submitting his/her inputs.

Service Provider benefits from encouraged usage of both voice and data by its customers.

Businesses benefit from providing better user experience to their customers.

B.3   Interactive Visual Information

This use case is about establishing interaction between the EVC user and the business while the EVC user is consuming visual information related to the call.

B.3.1   Short Description

Pre-condition: EVC user has received audio/visual information from the pizza store.

The EVC user, who is consuming the audio/visual information from the pizza store, requests assistance from the pizza store representative in order to place the order. At this time both EVC user and pizza store representative are browsing the same visual information while they are connected on the call. The pizza store representative may be displayed with additional information. EVC user can indicate his selection on the visual information which is seen also by the pizza store representative. Permissions may be defined such that only EVC user can make selection on the visual information.

B.3.2   Market benefits

EVC user benefits from having voice interaction while still being on the visual information. Service Provider benefits from encouraged usage of both voice and data by its customers. Businesses benefit from providing better user experience to their customers.

B.4   Multiple Device Supports

This use case is about an EVC User using multiple devices to consume EVC-based service.

B.4.1   Short Description

Pre-condition: The EVC user has two registered devices, a mobile phone and a tablet.

The EVC user places a call to a yellow page service using his/her mobile phone, requests assistance from the yellow page service representative in order to select a restaurant and book a table. The yellow page service representative offers to send visual information (e.g. restaurant video) to the EVC User. After getting the EVC User's consent from the selected device (e.g. tablet), the yellow page service representative on the call sends visual information (e.g., restaurant video) to the EVC User. EVC User receives and views the visual information according to the tablet (i.e. EVC User selected-device) capability. The EVC user can indicate his/her selection based on the audio/video information provided by the yellow page service representative.

B.4.2   Market benefits

The EVC user benefits from having convenience to use multiple devices to consume EVC-based service. Service Provider benefits from encouraged usage of both voice and data by its customers. Businesses benefit from providing better user experience to their customers.

B.5   Real Time Message

This use case is about complementing traditional calls with Real-time Messages. The EVC user can choose to answer an incoming call with voice and/or Real-time Message.

B.5.1   Short Description

Pre-condition: EVC user is receiving call from an EVC enabled user.

In case the surroundings of an EVC user are not conducive enough for a vocal conversation, say the EVC user is in a business conference or at a noisy place, the EVC user can choose to answer an incoming call with Real-time Message. EVC user can provide a reason to the caller so as to why he is unable to answer the call at the moment, or can continue the conversation in text/audio. If the callee rejects the call with Real-time Message, the caller receives a justification for the call being rejected, making the rejection more polite. For instance,

1. The EVC User is in a stadium and receives a call from his client

2. The EVC User rejects the call with Real-time Message, informing the caller of his current situation and saying (s)he will call back soon.

3. Alternatively, the EVC User answers with a tentative response using Real-time Message while he reaches to a place where vocal communication is viable; thus continues with the call, without having to reject it.

B.5.2 Market benifits

The EVC user gets an alternate medium for communication, in case the environment is not conducive enough for voice communication. Service Provider benefits from more calls being connected thus increased use of voice and data. Business benefits by providing enriched experience to the user.

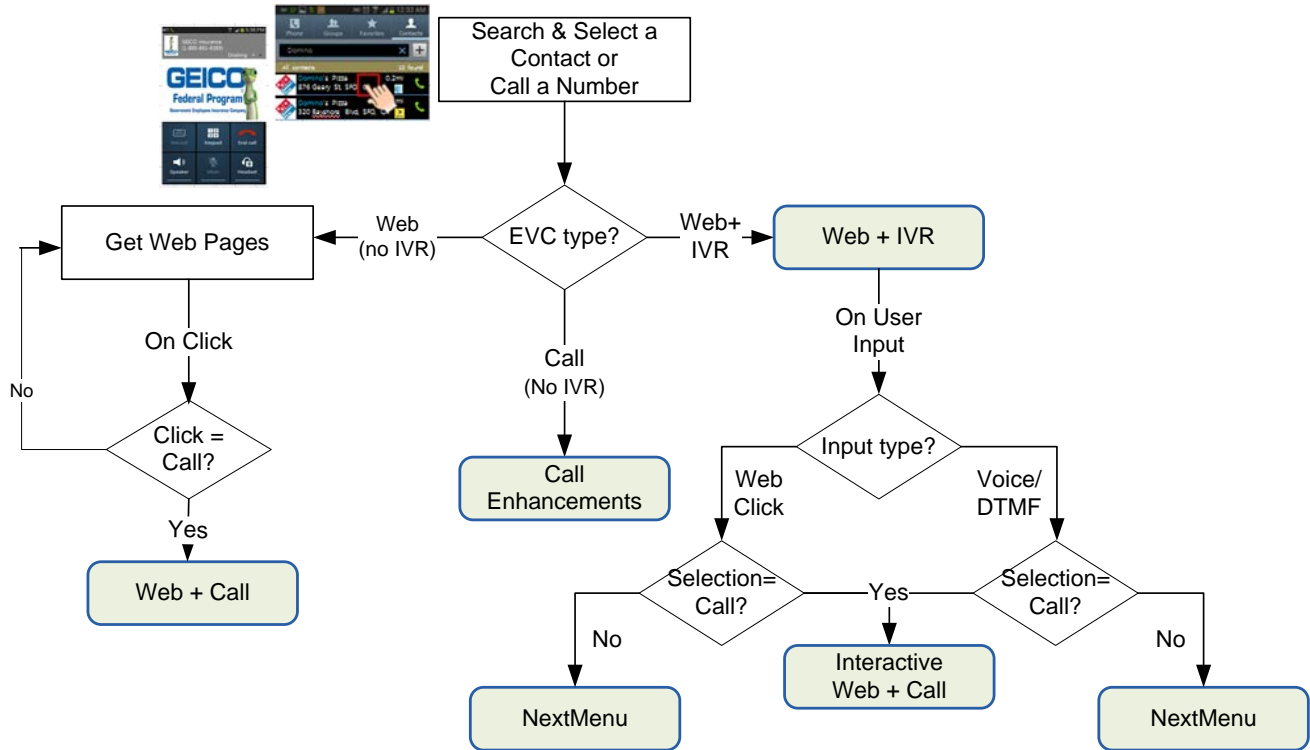# Appendix C.   Architecture Scenarios and Flows   (Normative)

Figure 3: Architectural Scenarios

C.1   Scenario 1: Call Enhancements

Example for "Call Enhancements" is – Caller/Callee seeing the social networking activity of the other user on the call at the time when the call is being established or during the call.

C.1.1   Scenario Flow:

1. EVC User B selects a contact (EVC User A) and his/her SNS contents to be shared before placing a call

2. EVC User A sees the social networking activity of EVC User B before accepting the incoming call

3. EVC User A also decides to share his/her SNS contents with EVC User B and they continue their call

4. EVC User B is also watching EVC User A's SNS contents during the call.

C.1.2 High Level Flow:
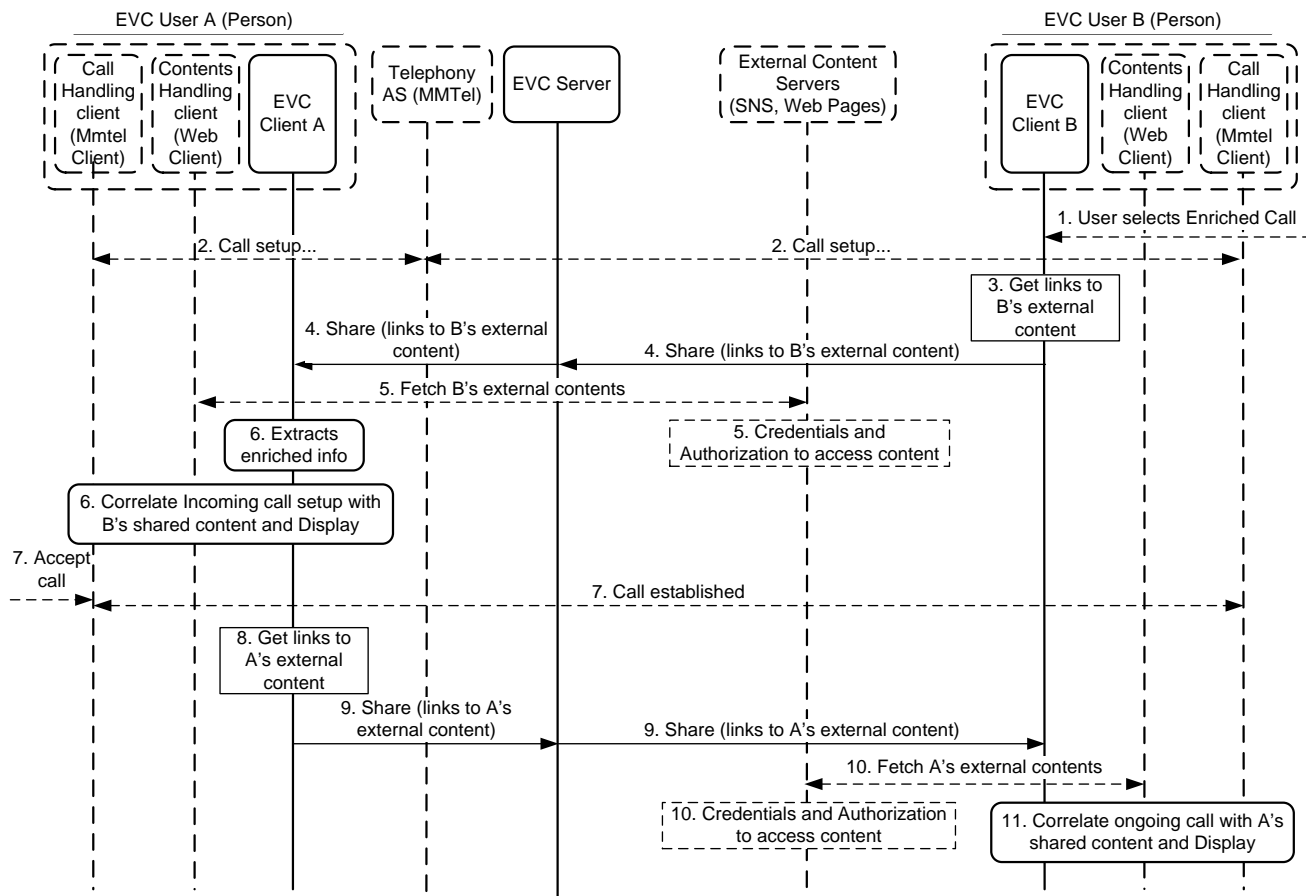
Figure 4: High Level Flow – Call Enhancements – Person to Person call

The above figure shows the EVC User B (Person) placing an enriched call request to EVC User A (Person) for sharing enriched information (e.g., SNS contents links) during the call establishment and/or during the call. The major steps include the following:

Pre-requisite: Both EVC User A and EVC User B have Social Networking System (SNS) accounts and clients on the devices. Each user's SNS account is accessible by the other user (relationship exists in the SNS selected and users are authorized to get each other's SNS information).

1. EVC User B selects to place an enriched call with EVC User A, for sharing enriched information (e.g., SNS contents);

2. Call Handling client on User B's device initiates call setup towards User A;

3. EVC Client B obtains the links to B's external content;

4. EVC Client B shares the enriched information (e.g. obtained in Step.3) with the EVC Client A during the call setup;

5. EVC User A's Contents Handling client fetches B's external contents after due SNS authorization;

6. EVC Client A extracts enriched information, correlates with the incoming call from EVC User B and displays at the same time as the incoming call alert;

7. EVC User A accepts the call and the call is established with EVC User B;

8. EVC Client A obtains the links to A's external content;

9. EVC Client A shares the enriched information (e.g. obtained in Step.8) with the EVC Client B while the call is ongoing;

10. EVC User B's Contents Handling client fetches A's external contents after due authorization;

11. EVC Client B extracts enriched information, correlates with the ongoing call with EVC User A and displays while the call is ongoing.

C.1.3   Service Media Specification Example:

The following example illustrates the structure of service media specification for Person-to-Person Call, based on the EVC Enriched Info Document [EVC_XSD_EnrichedInfo] and the use of CPM Event reporting framework as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework"

```xml
<?xml version="1.0" encoding="UTF-8"?>
<cpm-evfw xmlns="urn:oma:xml:cpm:evfw"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:evc="urn:oma:xml:evc:enrichedinfo">
<evc:evcenrichedinfo>
        <evc:call-correlation-info>
            <evc:from>[MSISDN or SIP URI]</evc:from>
            <evc:to>[MSISDN or SIP URI]</evc:to>
            < evc:call-seq>[CSeq#]</evc:call-seq>
        < evc:subject>this is call subject</evc:subject>
        </ evc:call-correlation-info>
        < evc:call-associated-data type="p2p">
            <evc:link>[HTTP URL]</evc:link>
            <evc:location>
             <evc:lat> 17.308688 </evc:lat>
             <evc:long> 77.695313 </evc:long>
            </evc:location>
        </evc:call-associated-data >
</evc:evcenrichedinfo>
</cpm-evfw>
```

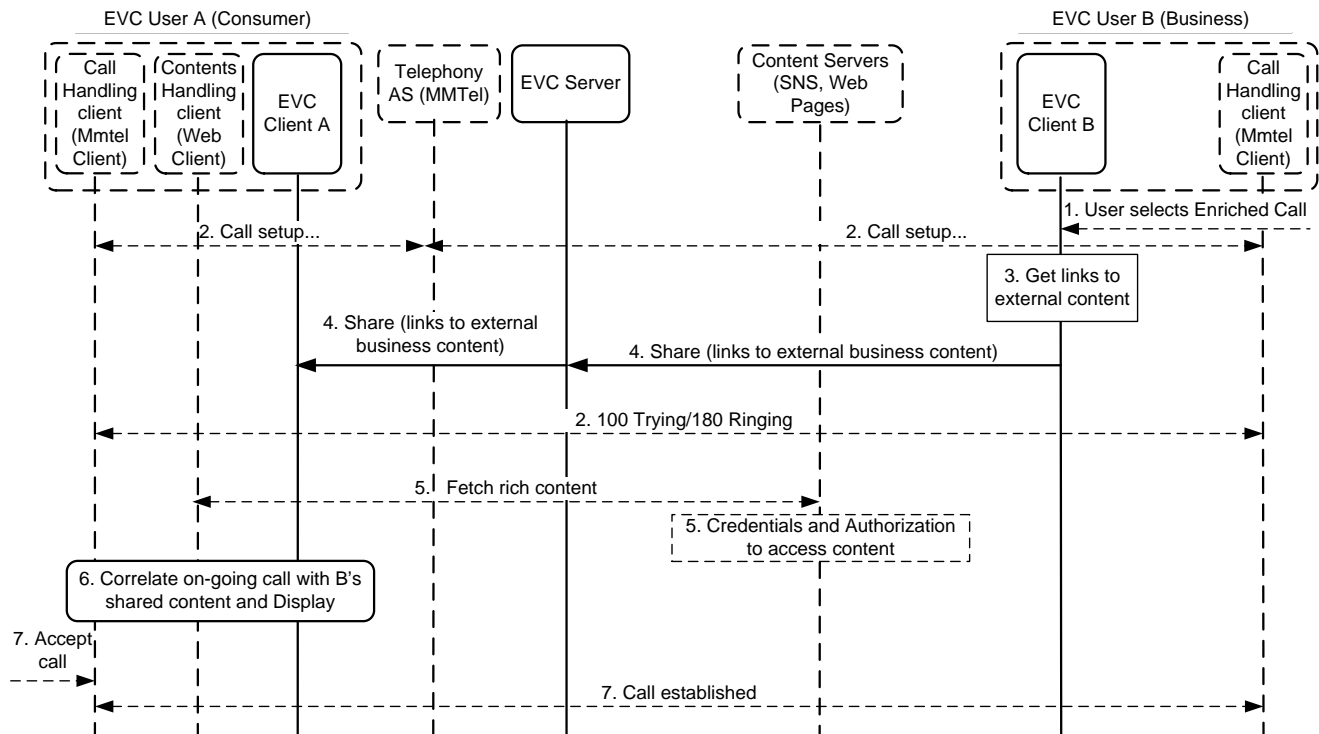## C.2   Scenario 2: Call Enhancements – Business to Client

The flows in this section depict examples of *Business to Client - Call Enhancements*: Callee (business representative) is sharing business information (e.g. media content from yellow page service) to Caller (consumer) on the call at the time when the call is being established and/or during the call.

C.2.1   Scenario Flow:

1. EVC User B (Business) selects a contact which is EVC User A (Consumer) to place a business promoting call;

2. During the call set up, EVC User B posts media content to EVC User A;

3. EVC User A receives and can watch the media content, prior to accepting the call from User B;

4. EVC User A accepts and the call is established.

C.2.2 High Level Flow:

Figure 5: High Level Flow – Call Enhancements -Business to Client

The above figure shows the EVC User B (who is a business representative) sharing business content with EVC User A (who is aconsumer) when the call is being established and/or during the call. The major steps include the following:

1. EVC User B selects to enrich the call with EVC User A, by sharing enriched information (e.g. Links to business contents) related to that call ;

2. Call Handling client on User B's device initiates call setup towards User A via procedures that are out of scope of this specification;

3. EVC Client B selects the links to external business content;

4. EVC Client B shares the enriched information with EVC Client A (during the call setup) via an EVC session.

5. EVC User A's Content Handling client fetches the contents from the external Content Servers after proper credentials and authorization checks.

6. EVC Client A extracts the enriched information and associates it with the incoming call with EVC User B, hence it displays the enriched information.

7. EVC User A accepts the call, which is then established with EVC User B. Further, EVC User B may repeat step 3 and step 4 to share more enriched information with EVC User A throughout the call.

Note: It is assumed that the EVC User A has the appropriate authorization and credentials to fetch the rich content from the Content Server(s).

C.3 Scenario 3: Call Enhancements –Multiple Devices Support

The flows in this section depict examples of *Multiple Devices Support – Call Enhancements*: Caller (EVC User A) has multiple UEs (UE1 and UE2), and can select one of his/her UEs to fetch and show the rich contents shared by Callee (EVC User B) on the call at the time when the call is being established and/or during the call.

C.3.1 Scenario Flow:

1. EVC User A has two devices (e.g. one phone/UE1 and one tablet/UE2) which are both registered devices in SIP/IP Core;

2. EVC User A chooses to accept the EVC session on his/her tablet/UE2;

3. EVC User A uses his/her phone/UE1 to establish call with EVC User B;

4. EVC User B decides to share his/her SNS contents with EVC User A;

5. The tablet/UE2 of EVC User A shows the SNS content shared by EVC User B, while the call is ongoing between the phone/UE1 and the UE3.
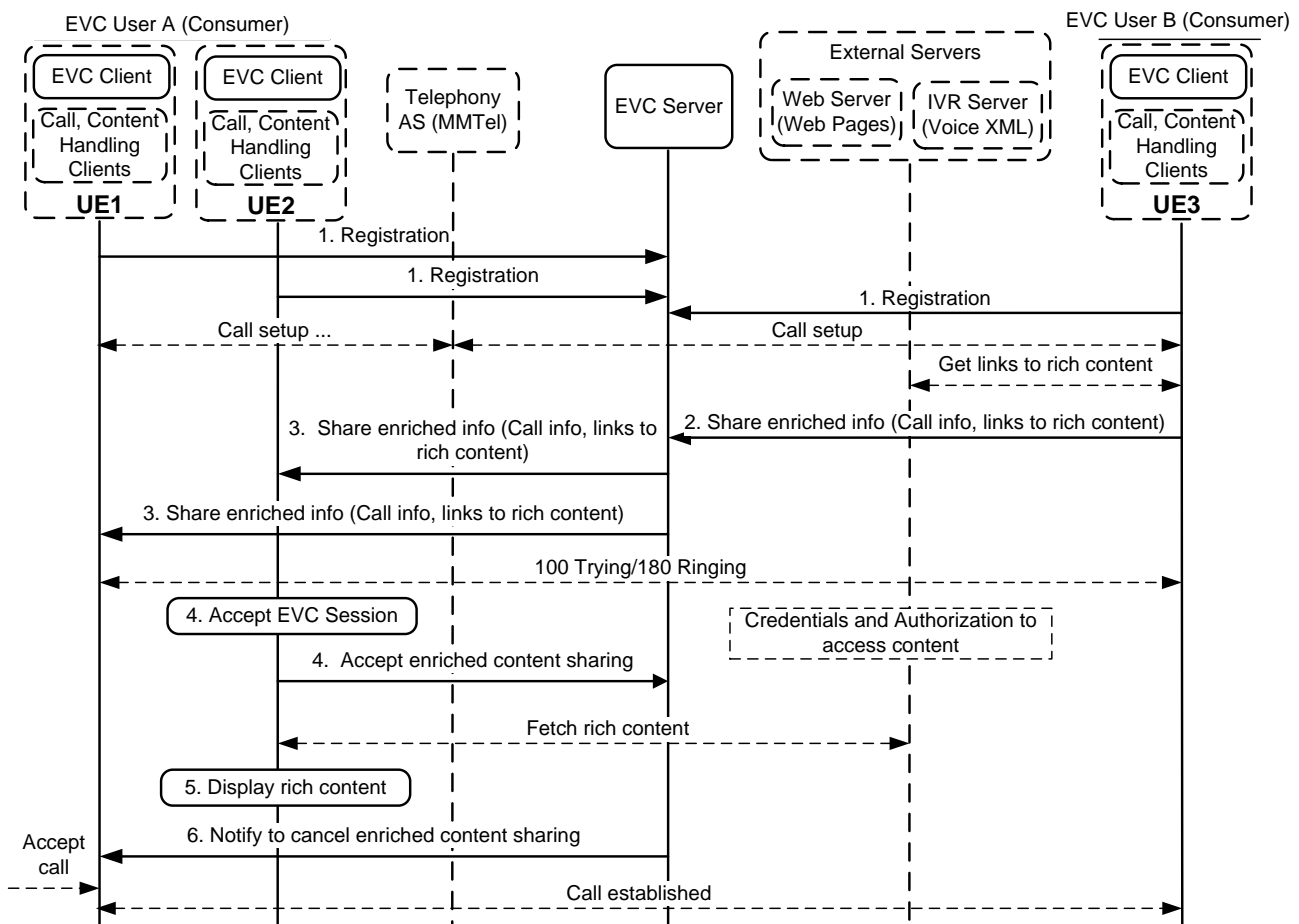
C.3.2 High Level Flow:

Figure 6: High Level Flow – Call Enhancements – Multiple Devices Support

The above figure shows EVC User B (Callee) shares his/her content to EVC User A (Caller) when the call is being established and/or during the call, and EVC User A selects one of his/her UEs to fetch and show rich content shared by EVC User B. The major steps include the following:

1. When the EVC Clients (in the UE1, UE2 and UE3) start, they register to the EVC Server.

2. When the call is being establish between UE1 and UE3 and/or during the call, EVC User B uses UE3 to retrieve link(s) to his/her rich content from the appropriate Content Server. The UE3 shares the enriched information (Call info, and links to rich content), to the EVC Server.

3. The EVC Server notifies the enriched information (Call info, and links to rich content) to each of the User A's registered UEs (e.g., UE1 and UE2).

4. The User A accepts the notification on UE2.

5. The Content Handling client (e.g. Web Client) associated with the EVC Client in the UE2 fetches and shows the rich content of EVC User B.

6. When received UE2's response to accept the content sharing, the EVC Server sends cancellation request (e.g., SIP CANCEL) to UE1 to notify it ignores the previous enriched information.

Note1: It is assumed that the EVC User A has the appropriate authorization and credentials to fetch the rich content shared by the EVC User B from the Content Server(s).

Note2: The UE hosts EVC Client, Call Handing client (e.g., MMTel Client), and Contents Handing client (e.g., Web Client), which are interacting with each other in the UE.

C.4   Scenario 4: Web + Call

Example for "Web + Call" is – EVC User browsing web pages and making his/her selection via web or by keying his inputs before making the call to Business.

C.4.1   Scenario Flow:

1. EVC User A (Consumer) selects a contact, which is EVC User B (Business);

2. EVC User A browses web pages of the EVC User B;

3. EVC User A keys inputs or makes a menu selection to complete an action on the Business page of EVC User B;

4. EVC User A places a call to EVC User B;

5. EVC User A is connected to EVC User B and his/her previous inputs on the Business page are shared to the EVC User B.

C.4.2   High Level Flow:
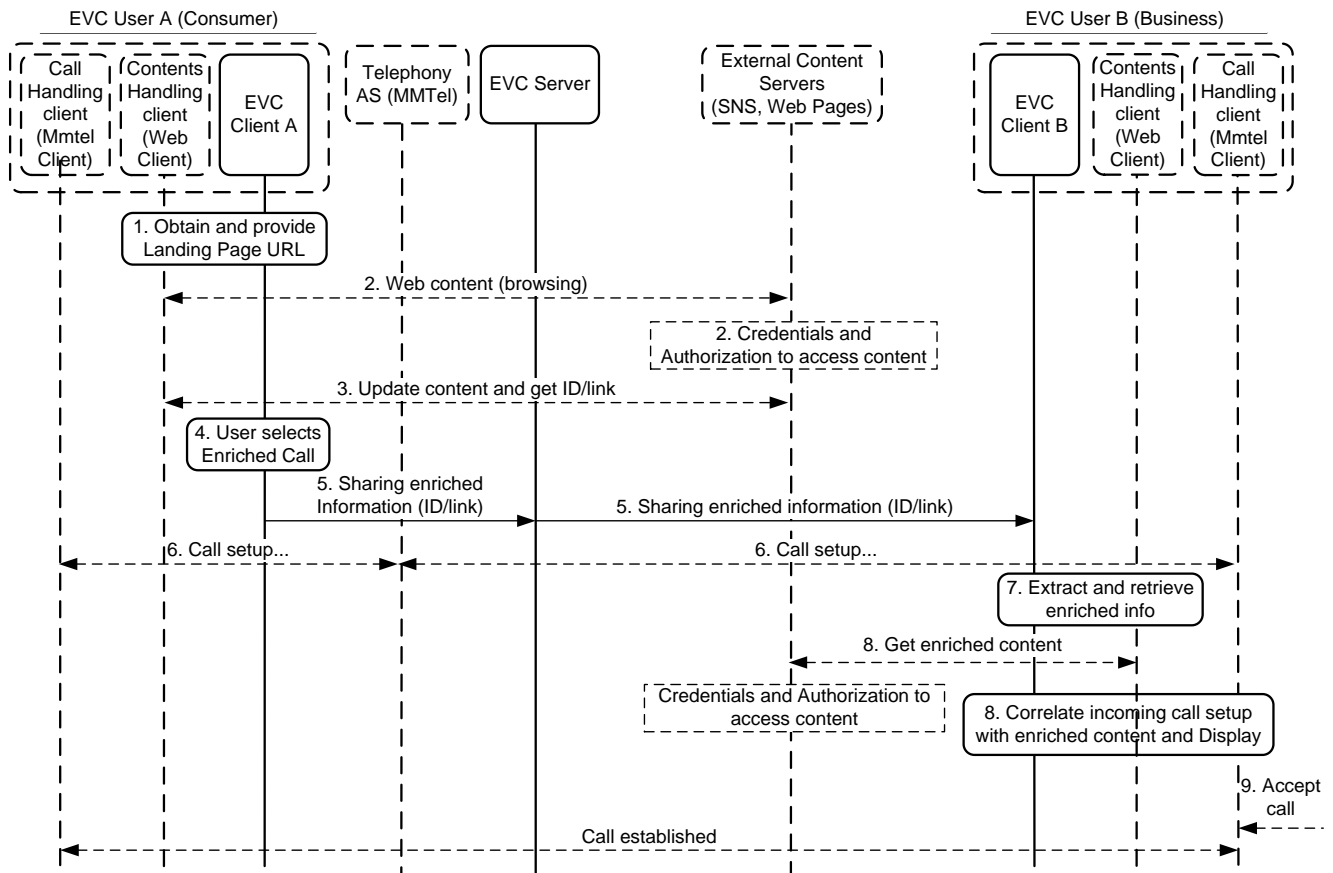
Figure 7: High Level Flow – Web + Call

The above figure shows the EVC User A (Consumer) browsing a business content and sharing enriched information to EVC User B (Business) during the call establishment and/or during the call. The major steps include the following:

1. EVC User A obtains the "landing page" URL of a business. The landing page URL obtained from the network or readily available on the device is then shared to the Contents Handling client.

2. Upon obtaining the landing page URL, the EVC User A starts browsing the web content of that business, with appropriate authentication and authorization.

3. Based on interaction by the EVC User A with the web content (e.g. filling a web form, placing an order etc.), the EVC User A may post the content on the external Content Server (via existing Content Handling/Web clients on the device) and obtain a reference to it.

4. EVC User A requests to place an enriched call with the business (EVC User B) in relation to the browsed content.

5. EVC Client A shares the enriched information (e.g. obtained in Step.3) with the EVC Client B during the call setup.

6. Call setup is ongoing. Note: This step may occur simultaneously with Step 5.

7. EVC Client B extracts the reference(s) to business/rich content from the enriched information shared by EVC Client A and retrieves the corresponding content via the Contents Handling client.

8. The Content Handling client (e.g. Web) associated with the EVC Client B fetches the rich content posted by the EVC User A, correlates and displays the rich content to EVC User B at the same time as User B is alerted about the incoming call.

9. EVC User B answers the call and uses the enriched EVC data received from EVC User A for this call.

C.4.3   Service Media Specification Example:

The following example illustrates the structure of service media specification for Web+Call Call, based on the EVC Enriched Info Document [EVC_XSD_EnrichedInfo] as described in section 7.1.1, and the use of CPM Event reporting framework as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework"

```xml
<?xml version="1.0" encoding="UTF-8"?>

<cpm-evfw xmlns="urn:oma:xml:cpm:evfw"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xmlns:evc="urn:oma:xml:evc:enrichedinfo">

<evc:evcenrichedinfo >

        <evc:call-correlation-info>

            <evc:from>[MSISDN or SIP URI]</evc:from>

            <evc:to>[MSISDN or SIP URI]</evc:to>

            <evc:call-seq>[CSeq#]</evc:call-seq>

            <evc:subject>this is call subject</evc:subject>

        </evc:call-correlation-info>

        <evc:call-associated-data type="wpc">

            <evc:link>[HTTP URL]</evc:link>

            <evc:web-reference-id>16855434</evc:web-reference-id>

        </evc:call-associated-data>

</evc:evcenrichedinfo>

</cpm-evfw>
```

C.5   Scenario 5: Visual IVR

Example for "Visual IVR" is – EVC User dials a Business number and listens to IVR options while viewing those IVR options at the same time. Further, the EVC User may navigate through subsequent menu options either through visual interaction, DTMF, or voice. EVC User may later choose to connect to a Business representative via call.

C.5.1   Scenario Flow:

1. User selects a contact and places a call to Business

2. Call is redirected to a Visual IVR system which shares Web Menu and corresponding Voice

3. User inputs to complete action on Web Menu or through Voice/DTMF input

4. Depending on the User input, User may be presented with next set of (Web and Voice) menu or User call may be redirected to the Representative on Business side

5. If connected to Representative, User can talk to Representative

C.5.2   Service Media Specification Example:

The following example illustrates the structure of service media specification for Visual IVR request, based on the EVC Visual IVR Request Document [EVC_XSD_VisualIVRReq] as described in section 7.2.3.2, and the use of CPM Event reporting framework as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework"

```xml
<?xml version="1.0" encoding="UTF-8"?>
<cpm-evfw xmlns="urn:oma:xml:cpm:evfw"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:evc="urn:oma:xml:evc:ivrrequest">
<evc:visual-ivr-info-request>
      <evc:call-correlation-info>
        <evc:from>[MSISDN or SIP URI]</evc:from>
        <evc:to>[MSISDN or SIP URI]</evc:to>
        <evc:subject>this is call subject</evc:subject>
      </evc:call-correlation-info>
      <evc:visual-ivr-data>
        <evc:CurrentWebURL>..\index.html</evc:CurrentWebURL>
        <evc:input type="DTMFCode">2</evc:input>
      </evc:visual-ivr-data>
</evc:visual-ivr-info-request>
</cpm-evfw>
```

The following example illustrates the structure for service media specification for Visual IVR response, based on the EVC Visual IVR Response Document [EVC_XSD_VisualIVRReq] as described in section 7.3.3.1, and the use of CPM Event reporting framework as described in [CPM-CONV-TS_2.1] section 6.7 "CPM Event Reporting Framework"

```xml
<?xml version="1.0" encoding="UTF-8"?>
<cpm-evfw xmlns="urn:oma:xml:cpm:evfw"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:evc=" urn:oma:xml:evc:ivrresponse">
<evc:visual-ivr-info-response>
      <evc:call-correlation-info>
        <evc:from>[MSISDN or SIP URI]</evc:from>
        <evc:to>[MSISDN or SIP URI]</evc:to>
        <evc:subject>this is call subject</evc:subject>
      </evc:call-correlation-info>
      <evc:visual-ivr-data>
        <evc:output type="NextWebURL">..\order.html</evc:output>
```
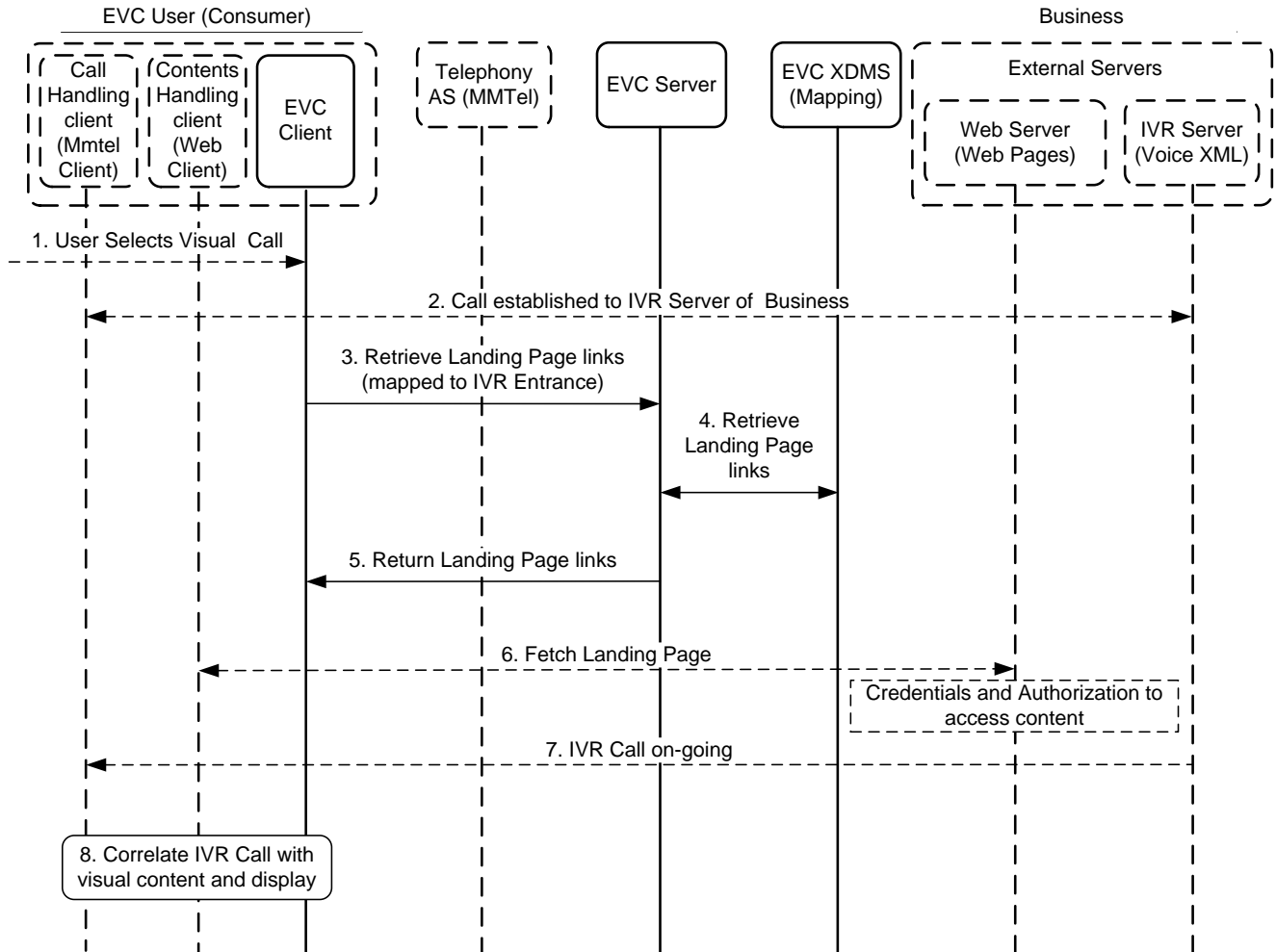
> </evc:visual-ivr-data>
>
> </evc:visual-ivr-info-response>
>
> </cpm-evfw>

C.5.2.1 Visual IVR Set Up:

The flows in this section depict examples of *Visual IVR Setup*: the EVC User will fetch and experience the corresponding visual content (e.g. landing web page related to IVR entrance) when the IVR is being established.
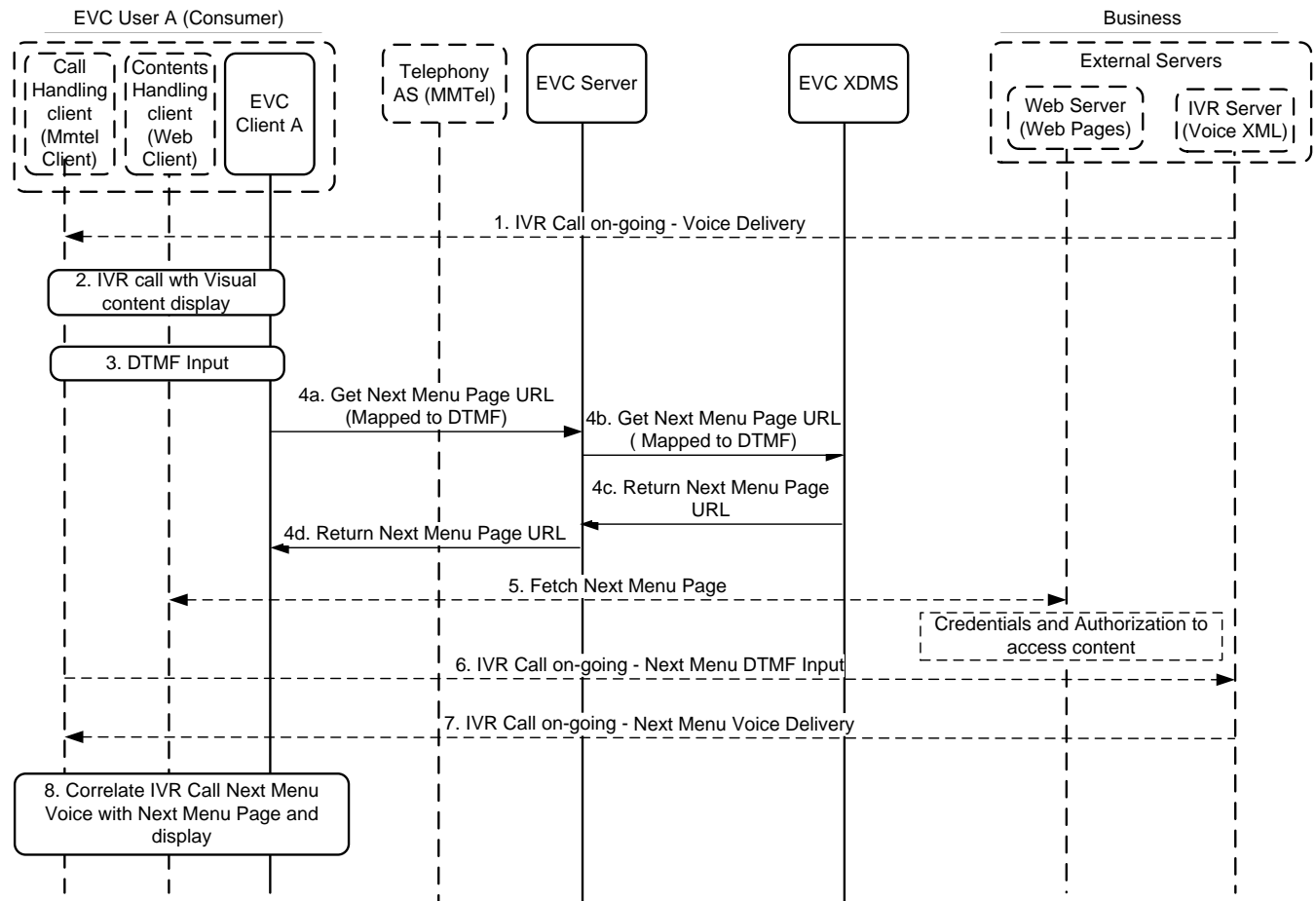

Figure 8: High Level Flow –Visual IVR Setup Scenario

The above figure shows the EVC User will fetch and experience the corresponding IVR visual content when the call being established is IVR call. The major steps include:

1. The EVC User selects to place a visual call.

2. The Call Handling client initiates the call towards Business, and the call is established with the IVR Server of Business.

3. The EVC Client requests to retrieve the links corresponding to the IVR landing page of the Visual IVR content.

4. The EVC Server retrieves the IVR landing page links from the EVC XDMS. The visual IVR landing page is mapped to the IVR entrance (i.e. IVR voice), which is derived from the mapping information stored in EVC XDMS.

5. The EVC Server returns the IVR landing page links to the EVC Client.

6. The Contents Handling client will fetch the corresponding content from the Web Server after proper credentials and authorization checks.

7. The IVR Call is on-going and the IVR Server delivers the IVR voice to the Call Handling client.

8. In the UE, the EVC Client synchronizes the media and data from the Call Handling client and the Contents Handling client, respectively, to create the visual IVR experience for the EVC User.

C.5.2.2   Visual IVR Next Menu (DTMF Input):

Figure 9: High Level Flow –Visual IVR Next Menu (DTMF Input) Scenario

The above figure shows the EVC User will fetch and experience the Next Menu IVR visual content when the IVR call is ongoing and user input is via DTMF. The major steps include:
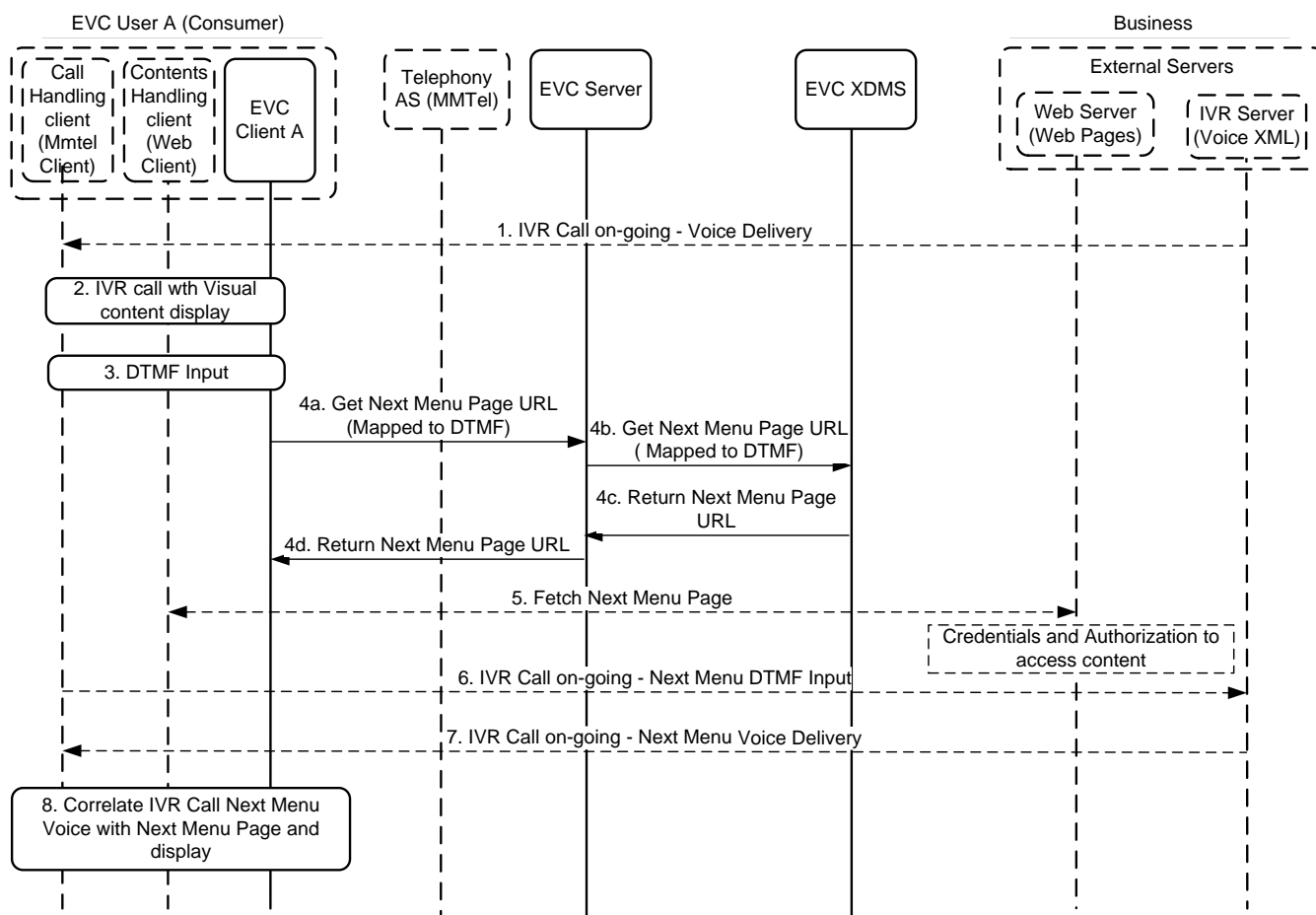
1. Call Handling client on the UE is receiving IVR media in the on-going IVR Call.

2. In the UE, the EVC Client co-ordinates the IVR media (from Call Handling client) and corresponding data (from Contents Handling client), to create the visual IVR experience for the EVC User. See Appendix C.5.2.1 (Visual IVR Setup).

3. The EVC User keys in IVR Next Menu selection via DTMF, corresponding to the visual IVR content.

4. The EVC Client requests for the Next Menu page URL corresponding to the EVC User's DTMF input, to the EVC Server.

5. EVC Server retrieves the Next Menu Page URL from the EVC XDMS and returns it to EVC Client.

6. The Contents Handling client will fetch the content corresponding to Next Menu page URL from the Web Server after proper credentials and authorization checks.

7. The Call Handling client will transport the EVC User's DTMF input over the on-going IVR Call

8. The IVR Server delivers the IVR Next Menu voice corresponding to received DTMF input to the Call Handling client.

   Note: Steps 6 and 7 (i.e. retrieving Next Menu voice) could be performed in parallel with Steps 4 to 5 (i.e. retrieving Next Menu page)

9. In the UE, the EVC Client co-ordinates the IVR Next Menu voice (from Call Handling client) and associated Next Menu page data (from Contents Handling client), to create the visual IVR experience for the EVC User.

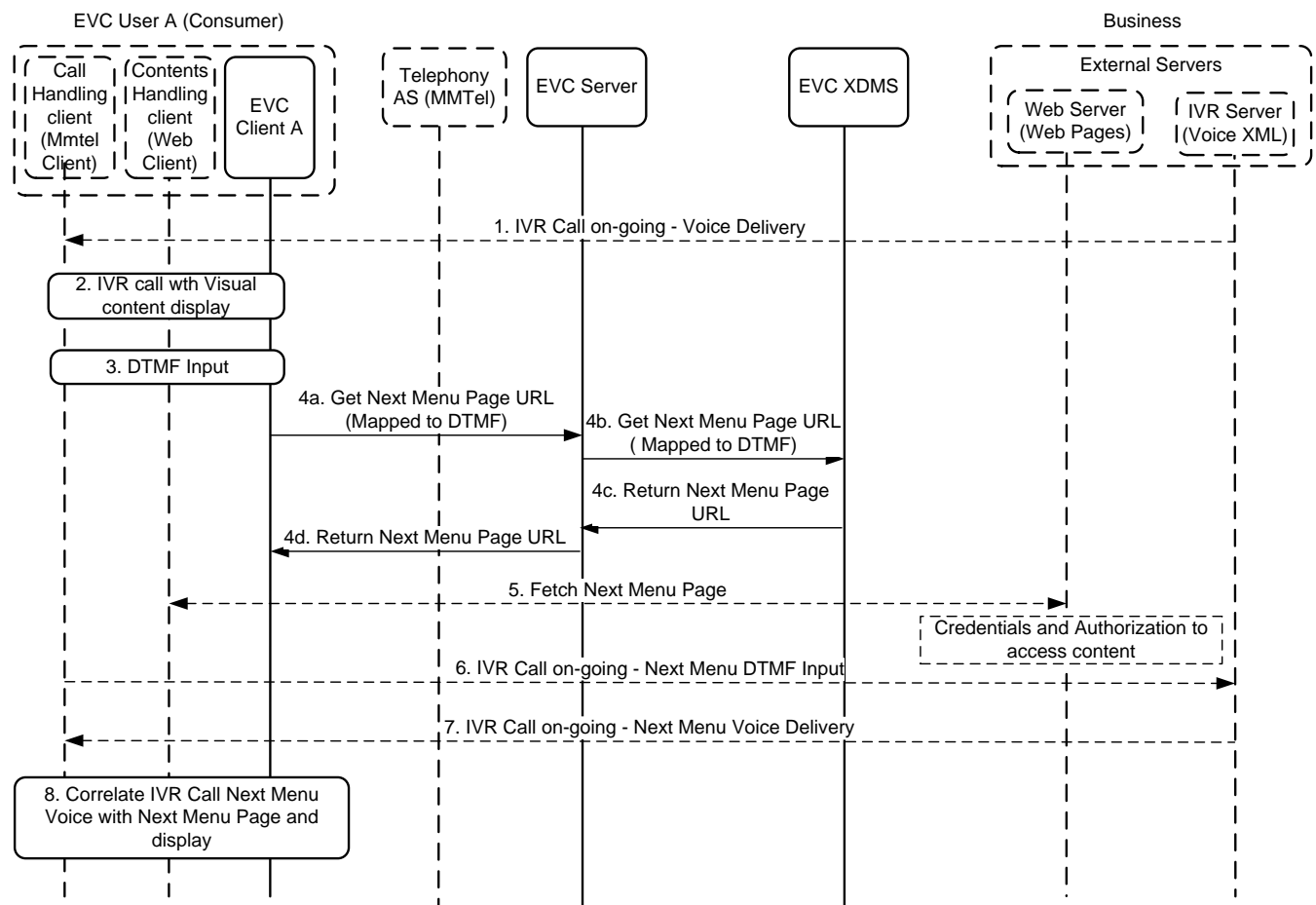## C.5.2.3 Visual IVR Next Menu (Web Input):

Figure 10: High Level Flow –Visual IVR Next Menu (Web Input) Scenario

The above figure shows the EVC User will fetch and experience the Next Menu IVR visual content when the IVR call is ongoing and user input is via Web. The major steps include:

1. Call Handling client on the UE is receiving IVR media in the on-going IVR Call.

2. In the UE, the EVC Client co-ordinates the IVR media (from Call Handling client) and corresponding data (from Contents Handling client), to create the visual IVR experience for the EVC User. See Appendix C.5.2.1 (Visual IVR Setup).

3. The EVC User keys in IVR Next Menu selection via Web input, on the visual IVR content.

4. The Contents Handling client will fetch the content corresponding to Next Menu page URL from the Web Server after proper credentials and authorization checks.

5. The EVC Client requests for the Next Menu DTMF/Text corresponding to the EVC User's Web input, to the EVC Server.

6. EVC Server retrieves the Next Menu DTMF/Text from the EVC XDMS and returns it to EVC Client.

7. The EVC Client will get the Voice corresponding to the Text, only if the Next Menu input obtained is Text in Step.5

8. The Call Handling client will transport the EVC User's DTMF/Voice input over the on-going IVR Call.

9. The IVR Server delivers the Next Menu IVR voice corresponding to received DTMF/Voice input to the Call Handling client.

10. In the UE, the EVC Client co-ordinates the IVR Next Menu voice (from Call Handling client) and associated Next Menu page data (from Contents Handling client), to create the visual IVR experience for the EVC User.

C.5.2.4   Visual IVR Next Menu (Voice Input):
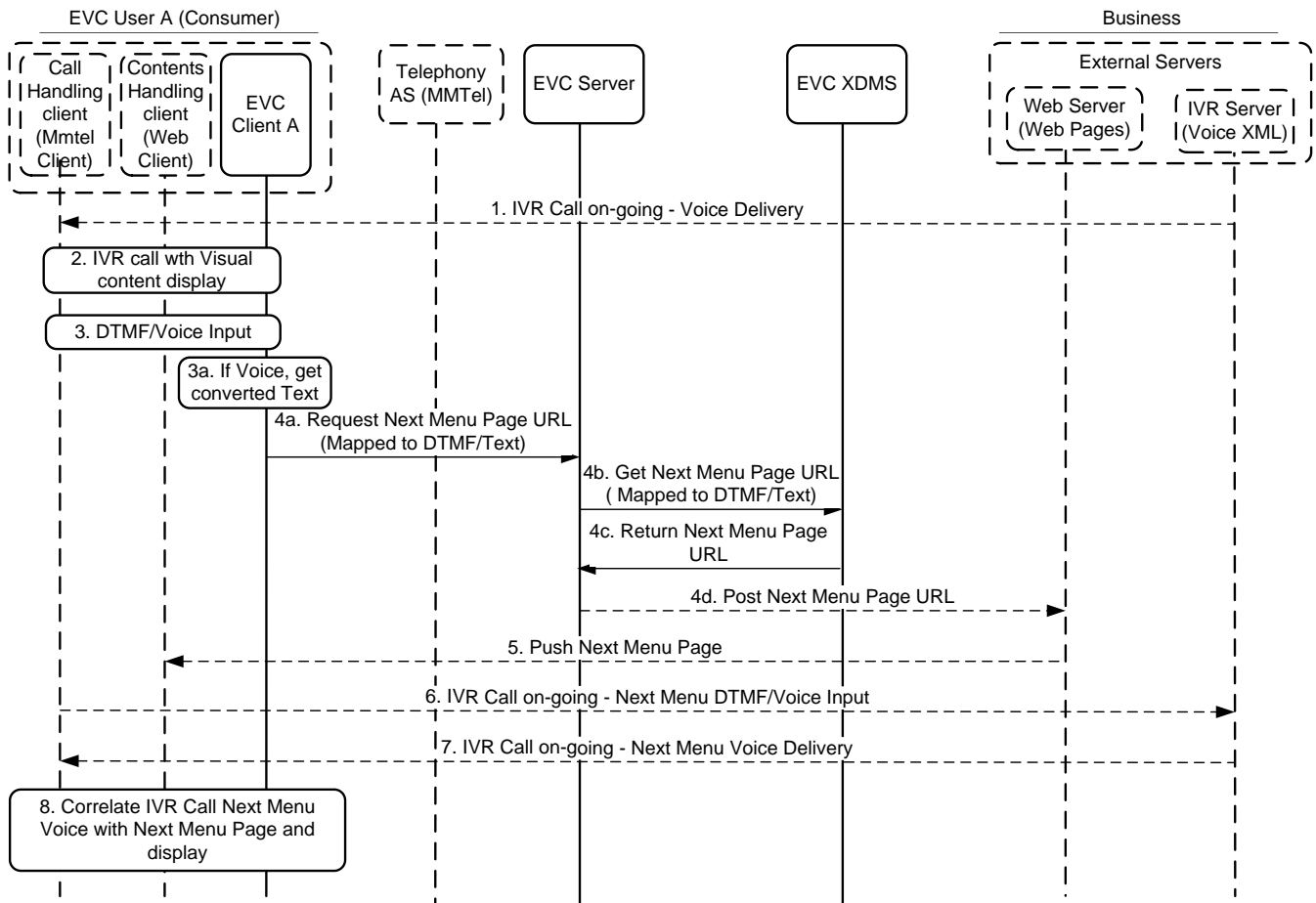

Figure 11: High Level Flow –Visual IVR Next Menu (Voice Input) Scenario

The above figure shows the EVC User will fetch and experience the Next Menu IVR visual content when the IVR call is ongoing and user input is via Voice. The major steps include:

1. Call Handling client on the UE is receiving IVR media in the on-going IVR Call.

2. In the UE, the EVC Client co-ordinates the IVR media (from Call Handling client) and corresponding data (from Contents Handling client), to create the visual IVR experience for the EVC User. See Appendix C.5.2.1 (Visual IVR Setup).

3. The EVC User keys in IVR Next Menu selection via Voice, corresponding to the visual IVR content.

4. EVC Client gets the voice converted to Text.

5. The EVC Client requests for the Next Menu page URL corresponding to the Text input, to the EVC Server.

6. EVC Server retrieves the Next Menu Page URL from the EVC XDMS and returns it to EVC Client.

7. The Contents Handling client will fetch the content corresponding to Next Menu page URL from the Web Server after proper credentials and authorization checks.

8. The Call Handling client will transport the EVC User's Voice input over the on-going IVR Call

9. The IVR Server delivers the IVR Next Menu voice corresponding to received Voice input to the Call Handling client.

10. Note: Steps 7 and 8 (i.e. retrieving Next Menu voice) could be performed in parallel with Steps 4 to 6 (i.e. retrieving Next Menu page)

11. In the UE, the EVC Client co-ordinates the IVR Next Menu voice (from Call Handling client) and associated Next Menu page data (from Contents Handling client), to create the visual IVR experience for the EVC User.

C.5.2.5   Visual IVR Next Menu (DTMF/Voice Input) – Content Push:

Figure 12: High Level Flow –Visual IVR Next Menu (DTMF/Voice Input) with Content Push Scenario

The above figure shows the EVC User will fetch and experience the Next Menu IVR visual content when the IVR call is ongoing and user input is via DTMF/Voice, via Content Push mechanism. The major steps include:

1. Call Handling client on the UE is receiving IVR media in the on-going IVR Call.

2. In the UE, the EVC Client co-ordinates the IVR media (from Call Handling client) and corresponding data (from Contents Handling client), to create the visual IVR experience for the EVC User. See Appendix C.5.2.1 (Visual IVR Set Up).

3. The EVC User keys in IVR Next Menu selection via DTMF/Voice, corresponding to the visual IVR content. If the user input is voice, the voice is translated to corresponding Text.

4. The EVC Client requests the Next Menu page URL corresponding to the EVC User's DTMF/Text input, to the EVC Server. Once the Next Menu page URL is retrieved from the EVC XDMS, it is passed to the External Server (Web).

5. The Contents Handling client will receive the content corresponding to Next Menu page URL from the Web Server via push mechanism. It is assumed that the EVC Client will re-use the connection established during the initial IVR set-up. See Step 6 of Appendix C.5.2.1 (Visual IVR Set Up).

6. The Call Handling client will transport the EVC User's DTMF/Voice input over the on-going IVR Call

7. The IVR Server delivers the IVR Next Menu voice corresponding to received DTMF/Voice input to the Call Handling client.

Note: Steps 6 and 7 (i.e. retrieving Next Menu voice) could be performed in parallel with Steps 4 to 5 (i.e. retrieving Next Menu page)

8. In the UE, the EVC Client co-ordinates the IVR Next Menu voice (from Call Handling client) and associated Next Menu page data (from Contents Handling client), to create the visual IVR experience for the EVC User.

C.6   Scenario 6: Interactive Visual Call

Example for "Interactive Visual Call" is – EVC User places a call to Business representative, and share/ interact with the visual content.

C.6.1   Scenario Flow:

1. EVC User A established a call with the Business representative (EVC User B).

2. While the call is established, the EVC User A requests interactive call to synchronize his/her visual content with business representative (EVC User B);

3. EVC User A and representative are on the call;

4. EVC User A and EVC User B are able to keep the visual content synchronized with each other, during the ongoing call.

5. Representative may advise EVC User A to consider the updates from him/her.
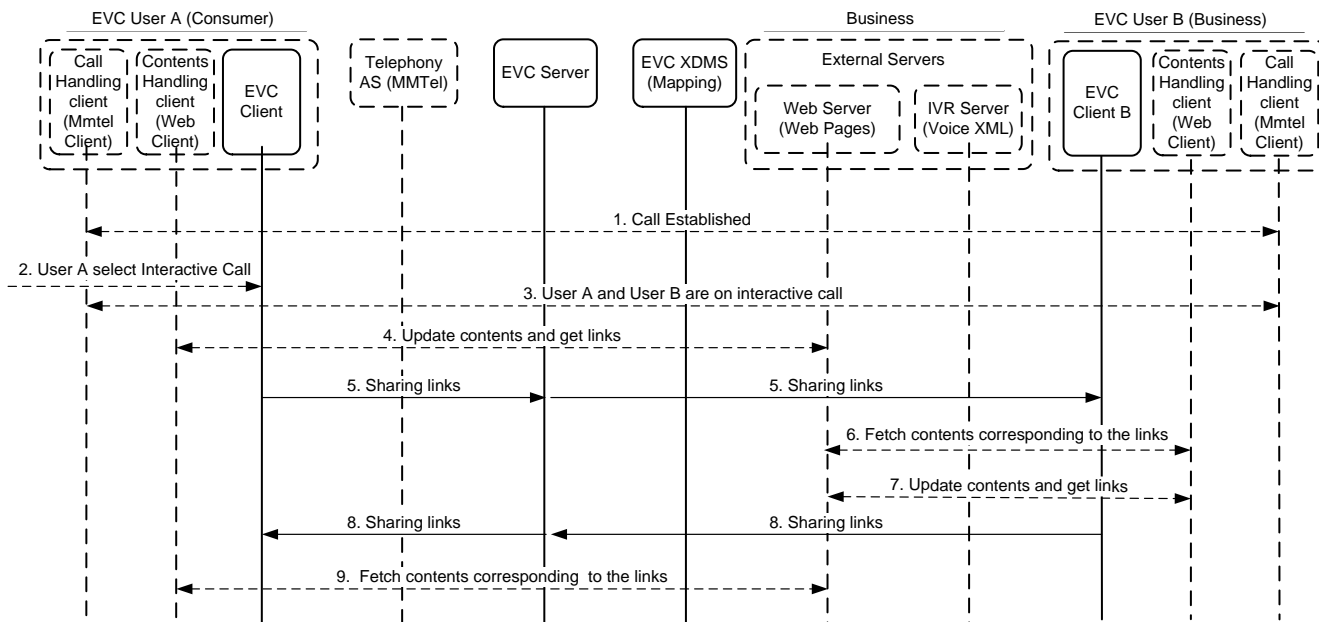
C.6.2   High Level Flow:

Figure 13: High Level Flow – Interactive Web + Call

The above figure shows the EVC User A (Consumer) and the EVC User B (Business) browsing the same business content and interacting with each other during a call. The major steps include the following:

1. EVC User A established a call with EVC User B;

2. EVC User A selects to place interactive call with EVC User B (Business);

3. EVC User A and EVC User B are now on an interactive call;

4. EVC User A updates visual contents and obtains the links to the updated content;

5. EVC Client A shares the links to updated content to EVC User B.

6. EVC User B's Content Handling client fetches the contents corresponding to the shared links, and displays the visual content to EVC User B;

7. EVC User B updates visual contents and obtains the links to the updated contents;

8. EVC Client B shares the links with the EVC Client A;

9. EVC User A's Content Handling client fetches the contents corresponding to the shared links, and displays the visual content to EVC User A.

C.7   Scenario 7: Real-time Text Message(RTTM) to Call Invitation

Example for "RTTM to Call Invitation" is – EVC User receives a call invitation from another EVC User, and EVC User (callee) responds with real-time text messages (RTTM) to the call invitation while accepting or rejecting the call.

C.7.1   Scenario Flow:

1. EVC User B selects to place a call with EVC User A.

2. EVC User A selects to accept/reject the call and respond with RTTM.

3. EVC User A types and shares his/her real-time text message towards EVC User B.

4. EVC User B views the real-time text message received with the accepted/rejected call.

C.7.2   High Level Flow:

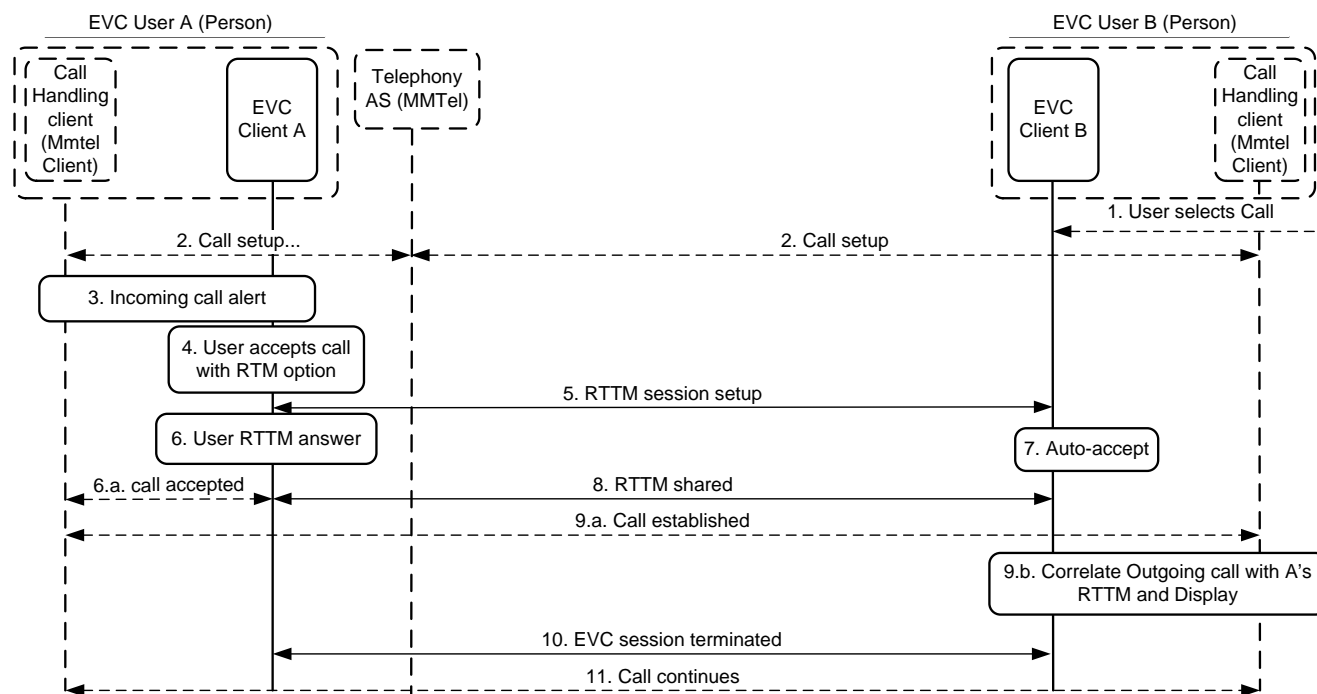### C.7.2.1   RTTM to Call Invitation – Accept:

Figure 14: High Level Flow –RTTM to Call Invitation – Accept

The above figure shows the EVC User B (Person) placing a call request to EVC User A (Person) and EVC User A responds with real-time text message (RTM) to the call invite while accepting the call. The major steps include the following:

1. EVC User B selects to place a call with EVC User A.

2. Call Handling client on User B's device initiates call setup towards User A.

3. EVC Client A displays incoming call alert providing option for EVC User A to respond with RTM.

4. EVC User A selects to accept the call and to respond with RTTM.

5. The EVC Client A initiates RTTM session setup towards EVC Client B.

6. EVC User A either selects a pre-defined acceptance answer text, or provides EVC User's custom input text and sends it.

   a) EVC Client A informs the Call Handling client on the device about the call acceptance, so that an acceptance final response can be sent for the call.

7. EVC Client B auto-accepts RTTM channel setup from EVC Client A.

8. The RTTM of EVC User A is sent towards EVC User B.

9. Call is established (9.a.) in parallel, while the EVC Client B correlates the real-time text message (received, with the accepted outgoing call and displays them together (9.b.).

10. When EVC User A indicates to end RTTM transmission (e.g. by closing the message composition window or pressing an explicit button), the EVC session is terminated.

11. The call continues independent of the EVC RTTM session termination.

Note 1: If User A needs to delay speaking to User B, it can choose to share a tentative acceptance real-time text message e.g., "hang-on a second".

Note 2: EVC User B can continue to talk over the established call while and after he/she has received real-time text message from the EVC User A.

C.7.2.2   RTTM to Call Invitati Visual IVR Setup on – Reject:

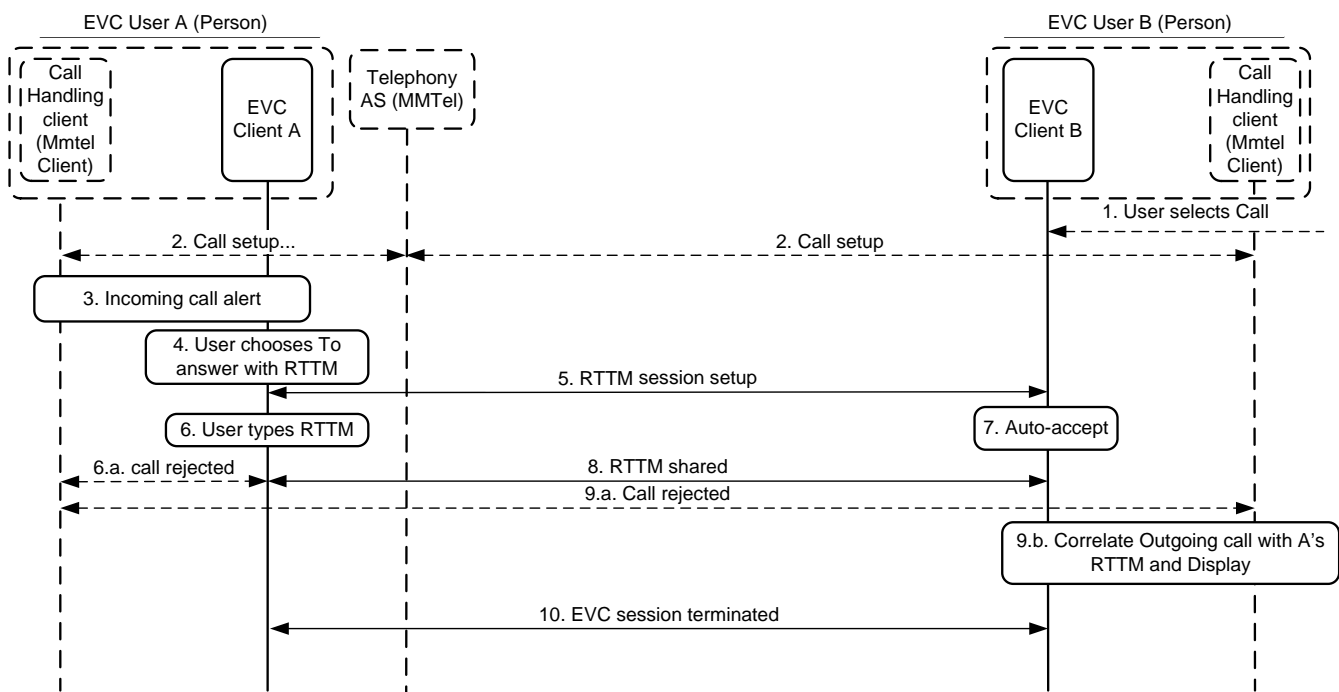**Figure 15: High Level Flow –RTTM to Call Invitation – Reject**

The above figure shows the EVC User B (Person) placing a call request to EVC User A (Person) and EVC User A responds with real-time text messages (RTTM) to the call invite while rejecting the call. EVC User B can share his/her real-time text message, depending on the scenario e.g., sharing reason for rejection of the call. The major steps include the following:

1. EVC User B selects to place a call with EVC User A.

2. Call Handling client on User B's device initiates call setup towards User A.

3. EVC Client A displays incoming call alert providing option for EVC User A to respond with RTM.

4. EVC User A selects to reject the call and to respond with RTTM.

5. EVC Client A initiates RTTM setup towards EVC Client B.

6. EVC User A either selects a pre-defined acceptance answer text, or provides EVC User's custom input text;

   a) EVC Client A informs the Call Handling client on the device about the call rejection, so that a rejection final response can be sent for the call.

7. EVC Client B auto-accepts RTM setup from EVC Client A, even if the associated call rejection answer was received.

8. The RTTM is sent by EVC Client A to EVC Client B

9. While the call is rejected (9.a.) the EVC Client B correlates the real-time text message received, with the rejected outgoing call from EVC User B and displays them together (9.b.).

10. When EVC User A indicates to end RTTM transmission (e.g. by closing the message composition window or pressing an explicit button), the EVC session is terminated.

Appendix D.   Static Conformance Requirements   (Normative)

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

D.1   SCR for EVC Client

Item	Function	Reference	Requirement
EVC-C-001-M	EVC Registration	Section 7.2.1	
EVC-C-002-M	EVC Call Enhancements - Person to Person Call	Section 7.2.2.2 C.1 C.3	
EVC-C-003-M	EVC Call Enhancements - Business to Client	Section 7.2.2.3 C.2 C.3	
EVC-C-004-M	EVC Call Enhancements - Web + Call	Section 7.2.2.4 C.4	
EVC-C-005-M	EVC Call Enhancements - Real-time Message	Section 7.2.2.5 C.7	
EVC-C-006-M	EVC Visual IVR - Service Media Specification - Request	Section 7.2.3.2 C.5	
EVC-C-007-M	EVC Visual IVR - First Visual IVR Menu	Section 7.2.3.3 C.6	
EVC-C-008-M	EVC Visual IVR - Next Visual IVR Menu – DTMF Input	Section 7.2.3.4 C.6	
EVC-C-009-M	EVC Visual IVR - Next Visual IVR Menu – Web Input	Section 7.2.3.5	
EVC-C-010-M	EVC Visual IVR - Next Visual IVR Menu – Voice Input	Section 7.2.3.6 C.6	

D.2   SCR for EVC Server

Item	Function	Reference	Requirement
EVC-S-001-M	Subscription to Registration Event Information	Section 7.3.1	
EVC-S-002-M	EVC Call Enhancements - Person to Person Call	Section 7.3.2.1 C.1 C.3	
EVC-S-003-M	EVC Call Enhancements - Business to Client	Section 7.3.2.2 C.2 C.3	
EVC-S-004-M	EVC Call Enhancements - Web + Call	Section 7.3.2.3 C.4	
EVC-S-005-M	EVC Call Enhancements - Real-time Message	Section 7.3.2.4 C.7	
EVC-S-006-M	EVC Visual IVR - Service Media Specification - Response	Section 7.3.3.1 C.5	

Item	Function	Reference	Requirement
EVC-S-007-M	EVC Visual IVR - Server Procedures	Section 7.3.3.2 C.6	
EVC-S-008-M	EVC Visual IVR - Next Visual IVR Menu – Web Input	Section 7.3.3.3 C.6	
EVC-S-009-M	EVC Visual IVR - Next Visual IVR Menu – Voice Input	Section 7.3.3.4 C.6	

D.3   SCR for SIP/IP Core

Item	Function	Reference	Requirement
EVC-SIC-001-M	Registration of EVC Client	Section 7.4.1	
EVC-SIC-002-M	Subscription to Registration Event Information	Section 7.4.2	

Appendix E.   Release Version in User-agent and Server Headers (Normative)

User-Agent and Server headers are used to indicate the release version and product information of the EVC Client and the EVC Server.

The EVC Client and the EVC Server SHALL implement the user-agent and server headers, according to the rules and procedures of [RFC3261] with the clarifications in this sub-clause specific for EVC.

The user-agent and server headers ABNF are specified in [RFC3261] and extended as follows:

```
Server = "Server" HCOLON server-val *(LWS server-val)
User-Agent = "User-Agent" HCOLON server-val *(LWS server-val)
server-val = product / comment
product = EVC-product / token [SLASH product-version]
product-version = token
```

E.1   EVC Version 1.0

This specification allows having several server-val tags. The first of those server-val tags shall be encoding according to the following ABNF:

```
EVC-product = "EVC-" EVC-device-token (SLASH EVC-product-version)
EVC-device-token = "client" | "serv" token
EVC-product-version = "OMA1.0"
```

Example 1:

In this example EVC Client acting as UAC and the EVC Server acting as UAS are OMA ISC release version 1.0 products. The EVC Client has inserted its own company and product name and version "Arena-Messaging1000/v1.01".

   User-Agent: EVC-client/OMA1.0 Arena-Messaging1000/v1.01

   Server: EVC-serv/OMA1.0

Example 2:

In this example both the EVC Server acting as UAC and the EVC Client acting as UAS are OMA EVC release version 1.0 products.

   User-Agent: EVC-serv/OMA1.0

   Server: EVC-client/OMA1.0