Enabler Release Definition for Mobile Codes

Approved Version 1.0 – 11 Jun 2013

Open Mobile Alliance

OMA-ERELD-MC-V1_0-20130611-A

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1. Scope (Informative)

The scope of this document is limited to the Enabler Release Definition of Mobile Codes (MC) according to OMA Release process and the Enabler Release specification baseline listed in section 5.

2. References

2.1 Normative References

[DATAMATRIX] "Information technology — Automatic identification and data capture techniques — Data Matrix bar code symbology specification", ISO/IEC 16022:2006, URL: http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_detail_ics.htm?csnumber=44230

[MC-ETR] "Enabler Test Requirements for Mobile Codes", Version 1.0, Open Mobile Alliance™, OMA-ETR-Mobile Codes-V1_0, URL:http://www.openmobilealliance.org/

[MC-TS] "Mobile Codes Technical Specification", Version 1.0, Open Mobile Alliance™, OMA-TS-MC-V1_0, URL:http://www.openmobilealliance.org/

[MC-TS_MO] "Mobile Codes Enabler Management Object Technical Specification", Version 1.0, Open Mobile Alliance™, OMA-TS-MC-_MO-V1_0, URL:http://www.openmobilealliance.org/

[QR] "Information technology — Automatic identification and data capture techniques — QR Code 2005 bar code symbology specification", ISO/IEC 18004:2006, URL: http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=43655

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt

[MC-SUP-MO] "XML Schema for the Mobile Codes Enabler Management Object", Version 1.0, Open Mobile Alliance™, OMA-SUP-MO_Mobile_Codes-V1_0, URL:http://www.openmobilealliance.org/

[MC-SUP-XSD] "XML Schema for the Mobile Codes Enabler", Version 1.0, Open Mobile Alliance™, OMA-SUP-XSD_MC-V1_0, URL:http://www.openmobilealliance.org/

2.2 Informative References

[MC-AD] "Mobile Codes Architecture", Version 1.0, Open Mobile Alliance™, OMA-AD-MC-V1_0, URL:http://www.openmobilealliance.org/

[MC-RD] "Mobile Codes Requirements", Version 1.0, Open Mobile Alliance™, OMA-RD-MC-V1_0, URL:http://www.openmobilealliance.org/

[OMADICT] "Dictionary for OMA Specifications", Version 2.8, Open Mobile Alliance™, OMA-ORG-Dictionary-V2_8, URL:http://www.openmobilealliance.org/

[OMAWP] "White Paper on Mobile Codes", Version 1.0, Open Mobile Alliance™, OMA-WP-MobileCodes-20081024-A, URL:http://www.openmobilealliance.org/

[SCRRULES] "SCR Rules and Procedures", Open Mobile Alliance™, OMA-ORG-SCR_Rules_and_Procedures, URL:http://www.openmobilealliance.org/

[URI] "RFC 3986. Uniform Resource Identifier (URI): Generic Syntax", IETF, URL: http://www.ietf.org/rfc/rfc3986.txt

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.

All terms in the [OMADICT] normally apply unless otherwise defined in Section 3.2 below.

3.2 Definitions

Code Management Platform	The Code Management Platform provides a resolution service pertaining to Indirect Codes; it is normally capable of performing both the Code Clearing House (CCH) function and Code Resolution (CR) and may also interact with other Code Management Platforms, as required. In certain deployment scenarios, the CCH function and the CR function may be implemented in two separate Code Management platforms. (See Split-CMP-Parent and Split-CMP-Child).
Code Resolution (or Code Resolution function)	The process of mapping a Direct Code or an Indirect Code into either content to be consumed directly by the device, or the address of content (or a service) to be accessed by the device. Typically, Code Resolution for Indirect Codes requires access to network service.
Code Transfer	The ability for a Mobile Code Publisher to change the Resolving CMP for a single or multiple Indirect Code Identifiers.
Data String	Data that represent a Direct Code or an Indirect Code. A Data String is encoded by a Symbology to yield a Mobile Code.
Direct Code	A Mobile Code that contains either (a) content for direct consumption for the handset, or (b) the address of the service to be accessed (typically a URI [**Error! Reference source not found.**])
Enabler Release	Collection of specifications that combined together forms an enabler for a service area, e.g., a download enabler, a browsing enabler, a messaging enabler, a location enabler, etc. The specifications that are forming an enabler should combined fulfil a number of related market requirements.
Home CMP	The CMP to which a particular MCC is configured to send all Code Resolution requests. Where applicable in a Split-CMP deployment scenario, the Home CMP may be a Split-CMP-Parent.
Indirect Code	A Mobile Code that contains an Indirect Code Identifier.
Indirect Code Identifier	An identifier in the Indirect Code that has to be resolved in order to access the intended content or service. See also Code Resolution.
Minimum Functionality Description	Description of the guaranteed features and functionality that will be enabled by implementing the minimum mandatory part of the Enabler Release.
Mobile Code	A 1D or 2D barcode as read by camera-equipped handsets
Mobile Code Client	The MC enabler software entity that resides in the device, and contains the functionality to acquire, decode, and extract the encoded information for further processing as required. This is often referred to as a Mobile Code Reader and these terms can be used synonymously.
Mobile Code Data Format	The syntactical description of the information contained within a Mobile Code.
Mobile Code Publisher	This is a brand (business, organisation or individual) who distributes certain content or services (e.g., an advertising campaign) to a mass audience by using Mobile Code scanning as a channel.
Mobile Code Registry	A local registry responsible for sub-allocation of Mobile Code Routing Prefixes within the ranges of Routing Prefixes obtained from OMNA. The Mobile Code Registry (MCR) also supports a data look-up facility accessible by authorised principals (e.g. CMPs or Split-CMP-Parents) for Routing Prefixes in its database.
Multi-lateral Arrangement	An arrangement amongst specific CMPs (including Split-CMP-Parents, where applicable) that are not

	associated with any Mobile Code Registry, in which the parties agreed to support each other in a multi-lateral way in order to manage sub-allocation of MC Routing Prefixes as well as discovery and updates thereof; details of such MLAs are not specified in the MC Enabler TS.
Registry-ID Recipient	An entity that is qualified to apply for and receive an OMNA Registry-ID assignment. This entity can be an MCR or another qualified entity (e.g. a designated entity within an MLA).
Remote CMP	The CMP that receives a Code Resolution request when the Home CMP (or Split-CMP-Parent, where applicable) is unable to resolve a particular Indirect Code Identifier.
Resolution Identifier	That part of the Indirect Code Identifier that is used to index the content or service.
Resolving CMP	The CMP (or Split-CMP-Child, where applicable) that is able to resolve a particular Indirect Code Identifier.
Routing Prefix	That part of the Indirect Code Identifier that contains a value that is uniquely assigned to the CMP (Split-CMP-Child, as applicable) and is used for routing.
Split-CMP-Child	A CMP in the Split-CMP deployment scenario, where only the Code Resolution function is implemented. In addition, subject to business relationship, a Split-CMP-Child may be associated with one and only one Split-CMP-Parent.
Split-CMP-Parent	A CMP in the Split-CMP deployment scenario, where only the Code Clearing House function is implemented. In addition, subject to business relationship, a Split-CMP-Parent may be associated with multiple Split-CMP-Children.
Symbology	The algorithm by which data is encoded as visual elements (typically arrangements of lines or squares), and the resultant “look and feel” for the user.

3.3 Abbreviations

1D	1-Dimensional
2D	2-Dimensional
CMP	Code Management Platform
MCR	Mobile Code Registry
ICI	Indirect Code Identifier
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
MC	Mobile Code
MCC	Mobile Code Client
MLA	Multi-lateral Arrangement
OMA	Open Mobile Alliance
OMNA	Open Mobile Naming Authority
QR	Quick Response, a type of barcode symbology **Error! Reference source not found.**
URI	Uniform Resource Identifier [**Error! Reference source not found.**]
URL	Uniform Resource Locator
XML	Extensible Markup Language

4. Mobile Codes Enabler Description (Informative)

4.1 Introduction

Background:

Mobile 2D and 1D barcodes have emerged as a promising enabler of the mobile Internet in some markets. There is, however, still a lack of interoperability between different markets and players. The majority of consumers are unlikely to adopt the technology before it comes pre-installed on a large variety of devices and offers easy interoperability between different service providers. Similarly, marketing, publishing and other industries that are otherwise motivated to provide Mobile Codes will not adopt them without adequate potential for consumer take-up. The MC Enabler aims to define requirements and ecosystem architecture and functional component specifications to enable large scale deployment of the globally interoperable Mobile Codes ecosystem.

Use case and justification:

Outside, in a café, a mobile handset camera is pointed at an advertisement, poster, leaflet or beer-mat. In just one or two click(s), the user arrives at a webpage designed specifically for that location. No struggle with the compromised navigational systems of mobile websites; no wait – just the instant fulfilment of the user's needs. The spontaneity of the response encourages an internet connection there and then; the internet content is relevant to the precise time and location of the user. The advertiser can track exactly which piece of paper generated the user response – and the mobile handset has enabled a trouble-free and relevant experience of the web that is potentially more useful to website provider and user alike. In addition, significant benefits for the mobile industry are anticipated from increased usage of the internet over mobile handsets as well as potential participation in the online advertising opportunities.

4.1.1 Summary

As described in [OMAWP], two methods of encoding data in the Mobile Code are: a) Direct Mobile Codes, and b) Indirect Mobile Codes. In general, Direct Mobile Codes require relatively fewer actors and functional components than in the Indirect Mobile Codes ecosystem. Details of the actors for Indirect Codes relevant to this enabler are discussed in the [MC-RD]. Architecture and deployment scenarios are discussed in [MC-AD].

The following summary indicates all the key actors identified in the Indirect Mobile Codes ecosystem:

- Mobile Code Publisher (or brand)
- End user
- Mobile Code Client (also commonly referred to as Mobile Code reader of scanner)
- Mobile device
- Code Management Platform
- Mobile operator (and Home CMP provider)
- Mobile Code Registry

4.2 Version 1.0 Functionality

The Mobile Codes Enabler contains support for a full ecosystem for both Direct and Indirect 2D Mobile Codes. Support of 1D Mobile Codes is for a future release.

Technology, interface behaviour and procedures for interoperability (some of which are optional) are specified for:

- Symbology(ies)
- Mobile Code Data Format
- Direct encoding of content
- Encoding of Indirect Code Identifiers
- Resolution of Indirect Code Identifiers
- Security, Tracking & Reporting, and Code Transfer procedures

5. Document Listing for Mobile Codes Enabler

Doc Ref	Permanent Document Reference	Description
Requirement Document		
[MC-RD]	OMA-RD-MC-V1_0-20130611-A	Requirements Document for MC Enabler
Architecture Document		
[MC-AD]	OMA-AD-MC-V1_0-20130611-A	Architecture Document for MC Enabler
Technical Specifications		
[MC-TS]	OMA-TS-MC-V1_0-20130611-A	Technical Specification for MC Enabler
[MC-TS-MO]	OMA-TS-MC_MO-V1_0-20130611-A	Technical Specification for MC Enabler Management Object
Supporting Files		
[MC-SUP-XSD]	OMA-SUP-XSD_MC-V1_0-20130611-A	XML Schema Document for MC Enabler
[MC-SUP-MO]	OMA-SUP-MO_Mobile_Codes-V1_0-20130611-A	XML Schema Document for MC Enabler Management Object

Table 1: Listing of Documents in MC Enabler

6. OMNA Considerations

6.1 Namespace Registration

The Version 1.0 release of the MC Enabler has obtained the following registrations from OMNA:

1. URN-based Mobile Codes XML Schema Identifier as follows:

   urn:oma:xml:oma-mc_xs:1.0

   Public Reachable Information

   Path: http://www.openmobilealliance.org/tech/profiles/

   Name: mc_xs-v1_0.xsd

2. URN-based Mobile Codes Management Object Identifier as follows:

   urn:oma:mo:oma-mc:1.0

   Public Reachable Information

   Path: http://www.openmobilealliance.org/tech/omna/dm_mo/

   Name: mo_mcc-v1_0.ddf

6.2 ICI Allocation

The Version 1.0 release of the MC Enabler assumes that the allocation of globally unique Indirect Code Identifiers (see the 'Registry-ID' and 'Routing Prefix' portions thereof as specified in Section 8.1 – Mobile Code Data Format in [MC-TS]) will be administered by OMNA. This allocation task involves the following aspects described at a high-level below:

- Registry-IDs are assigned to qualified Registry-ID Recipients based on OMNA-defined administrative procedures.
- Routing Prefixes (specifically, the 'Remaining-Part-of-Routing-Prefix' portion thereof, within the range of a Registry-ID reserved for use by OMNA itself) are assigned by OMNA to CMP service providers.

Further recommendations for the above administrative tasks performed by OMNA are required. However, given that such OMNA administrative guidelines are out-of-scope of the MC 1.0 WID, guidance of TP will be sought as to the best way to proceed.

7. Conformance Requirements Notation Details (Informative)

The tables in following chapters use the following notation:

Item: Entry in this column SHALL be a valid ScrItem according to [SCRRULES].

Feature/Application: Entry in this column SHOULD be a short descriptive label to the **Item** in question.

Requirement: Expression in the column SHALL be a valid TerminalExpression according to [SCRRULES] and it SHALL accurately reflect the architectural requirement of the **Item** in question.

Mobile Codes 1.0 Enabler specifies normatively the Mobile Code Data Format for encoding data into the 2D barcode image according to supported mandatory symbologies for publication, and also what behaviours the Mobile Code Client (MCC) must follow to resolve a Mobile Code after reading the Data String that is encoded in the barcode image. Direct Codes can be resolved by the MCC without invoking network access to any network server; whereas, Indirect Codes are resolved with mandatory actions by the home network server and other additional servers, as required. For Indirect Codes, MC Enabler also specifies behaviours for different network servers for interoperability, and also support for additional (including optional) features desirable for the 2D barcode ecosystem.

In summary, MC 1.0 specifies the following technology, interface behaviour and procedures for interoperability (some of which are optional):

- Symbology(ies)
- Mobile Code Data Format
- Direct encoding of content
- Encoding of Indirect Code Identifiers
- Resolution of Indirect Code Identifiers
- Security, Tracking & Reporting, and Code Transfer procedures

7.1 Minimum Functionality Description for MC Enabler

The minimum functionality required for MC Enabler is divided into client and server requirements.

On the client side it is a minimum that the following are supported:

- Ability to read the mandatory supported Mobile Code Symbologies (Data Matrix and QR Code).
- Ability to process the Data String decoded from the code image as either Direct Code, or Indirect Code.
    - If Direct Code, display any ‘Display-Text’ if present and/or invoke an appropriate application on the mobile device to consume the Data String, as required.
    - If Indirect Code, parse the Data String and use the Indirect Code Identifier (ICI) therein to populate the Code Resolution request message sent (together with any mandatory and optional parameters) to the Home CMP. Upon receipt of the response of Code Resolution, invoke an appropriate application on the mobile device to consume the returned information, as required.

On the server side (applicable to Indirect Code only) it is a minimum that the following are supported:

- Ability to receive and parse the MCC Code Resolution request. And, either resolve the code locally, or determine the network address of and forward the Code Resolution request to the Remote CMP responsible for resolving the code.
- Ability to resolve an Indirect Code when acting as the Resolving CMP (i.e., either as the Home CMP or Remote CMP) by matching the ICI (specifically, the 'Resolution Identifier' portion thereof) with the action intended by the Mobile Code Publisher and returning the result to the MCC.
- Ability to satisfy all inter-network element security safeguards.

For all behaviours for the client or server side, all messaging format and syntax must be compliant with the details of the Interfaces MC-1, MC-3, MC-4 and MC-6 (see [MC-TS]).

All recipients of Registry-IDs from the OMNA must cooperate with OMNA to propagate globally unique ICIs in accordance with the specified Mobile Code Data Format. This may involve establishment of the Mobile Code Registry (requiring use of Interfaces MC-2 and MC-5) or a Multi-lateral Arrangement amongst CMPs within a community of interests.

Compliance with MC Enabler minimum functionality as described in this section will enable a mobile device implemented with compliant MCC to resolve Direct Codes without interaction with network servers; and also resolve Indirect Codes by sending a Code Resolution request message to its designated Home CMP which in turns interacts with other network servers, as required.

Additional features specified in the [MC-TS] are generally desirable depending on market needs, but are beyond the minimum compliance requirements of MC 1.0.

8. ERDEF for MC-Client Requirements

Item	Feature / Application	Requirement
OMA-ERDEF-MC-C-001	Mobile Code Client	[MC-TS]

Table 2: ERDEF for MC Client-side Requirements

9. ERDEF for MC-Server Requirements

Item	Feature / Application	Requirement
OMA-ERDEF-MC-S-001	Mobile Code Server	[MC-TS]

Table 3: ERDEF for MC Server-side Requirements

Appendix A. Change History (Informative)

A.1 Approved Version 1.0 History

Reference	Date	Description
Approved Version OMA-ERELD-MC-V1_0	11 Jun 2013	Status changed to Approved by TP: TP ref#: OMA-TP-2013-0182-INP_MC_V1_0_for_final_Approval