



URI Schemes Requirements

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Open Mobile Alliance
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1. Scope

(Informative)

This document defines the requirements for the URI Schemes work item. URI Schemes are an internet-wide accepted approach to defining entities and their relationship to protocols and applications. They provide vendors and developers an applications independent way to bind services to identified internet entities. This document provides scope and guidance to the use of a set of these schemes in the mobile environment.

While there are some existing URI Schemes in use within the OMA community, this document concentrates on those schemes that are accepted by the IETF and the internet community as a whole. Existing schemes such as wtai: are not discussed.

2. References

2.1 Normative References

- RFC2119** “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997, URL: <http://www.ietf.org/rfc/rfc2119.txt>
- RFC3986** “Uniform Resource Identifiers (URI): Generic Syntax”, T. Berners-Lee, R. Fielding, L. Masinter, January 2005, URL: <http://www.ietf.org/rfc/rfc3986.txt>

2.2 Informative References

- MMSURI** “MMS URI Schemes”, Internet Draft, Expired Draft, URL: <http://www.ietf.org/internet-drafts/draft-wugofski-mms-uri-scheme-00.txt>
- RFC2717BIS** “Guidelines and Registration Procedures for new URI Schemes”, T.Hansen, T. Hardie, L. Masinter, January 3, 2005 (Expires July 4, 2005) URL: <http://XXX/draft-hansen-2717bis-2718bis-uri-guidelines-02.txt>
- RFC3305** “Report from the Joint W3C/IETF URI Planning Interest Group: Uniform Resource Identifiers (URIs), URLs, and Uniform Resource Names (URNs): Clarifications and Recommendations”, M.Mealling, R. Denenberg, August 2002, URL: <http://www.faqs.org/rfcs/rfc3305.html>
- RFC3966** “The tel URI for Telephone Numbers”, H. Schulzrinne, December 2004, URL: <http://www.faqs.org/ftp/rfc/rfc3966.txt>
- RFC3601** “Text String Notation for Dial Sequences and Global Switched Telephone Network (GSTN) / E.164 Addresses”, RFC3601.URL: <http://www.ietf.org/rfc/rfc3601.txt>
- WAP268** “Wireless Telephony Application Interface Specification”, WAP-268-WTAI-20010908-a.
- W3CURI** URL: <http://www.w3.org/Addressing/>

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

URI Scheme	The “scheme” part of a Uniform Resource Identifier as specified in RFC3986. It defines the nature of the associated URI, and may be a protocol, process or type definition for the associated URI.
URI Scheme Handler	A logical application or service which acts to process a URI according to its scheme.

3.3 Abbreviations

OMA	Open Mobile Alliance
IETF	Internet Engineering Task Force
URI	Uniform Resource Identifier

4. Introduction (Informative)

This document forms part of the URI schemes work item deliberables which is intended to complement existing URI schemes used in or defined in OMA standards, such as the “wtai” and “pict” URI schemes.

This document presents the use cases and defines the requirements for a set of URI Schemes that are deemed useful and feasible in mobile phones. Moreover the intent is to ensure a common usage of these URI schemes irrespective of the OMA enabler being used when the URI scheme is actioned.

Although URI schemes already exist that can meet some of the requirements defined in this document there are requirements that are not met today. These will be fulfilled through the remainder of this work item.

Today there are many URI schemes in use on the Internet. Most people are familiar with the “http:” scheme. Other common schemes are “mailto” (for e-mail addresses) and “file” (resources on a file system). The generic syntax for URI schemes is defined in [RFC3986]. Although most of the URI standardization is done in the IETF, the W3C has done a great deal to for example explain the difference between URIs, URLs, and URNs, see <<http://www.w3.org/TR/uri-clarification/>>.

The Internet Assigned Numbers Authority (IANA) has a place to register for URI schemes. But many proprietary schemes are rarely registered. A procedure for registering URL schemes names for use on the public Internet is defined in [RFC2717BIS]. This procedure requires review and approval by the IETF. This process also allows for a more informal registration process where IETF is not the owner of the scheme.

5. Use Cases (Informative)

The following use cases have been defined for each of the features listed above. The list is not intended to be an exhaustive list of use cases but illustrative for the features.

- 1) Initiating Telephony calls from a received message
- 2) Initiating Telephony calls from within the Browser
- 3) Sending a message from within the Browser
- 4) Integrating a Messaging-based Value-added-service with the Browser
- 5) Submitting an XHTML form to an email account
- 6) Presence signup from with a web page
- 7) Initiating an instant message from within a contact record.

5.1 Initiate a Telephony call from within a Message

5.1.1 Short Description

This use case describes the situation where User A sends a message (e-mail, SMS, or MMS) to User B, and User B initiates a call to User A. Note that the number used by User B is transmitted by User A within the message, and is not necessarily the number associated with the device User A sent the MMS with.

5.1.2 Actors

The Actors in this Use Case are:

- 1) User A – the sender of the message
- 2) User B – the recipient of the message and the initiator of the telephony call.

5.1.2.1 Actor Specific Issues

5.1.2.2 Actor Specific Benefits

The main benefit is for User B to be able to make a call to a specific number in the message (e.g. “Call mom at [0704837364](tel:0704837364)”), without having to remember the number, close the messaging application, and enter the number into the phone to make the call. User B selects the number in the message in the same way as selecting a link in a Web page.

Many messaging applications use heuristic methods to identify phone numbers within the message text. With a specific URI scheme for telephone numbers in the message, telephone numbers are distinct in the message.

5.1.3 Pre-conditions

- User A is able to compose and send messages. The message type can be e-mail, MMS, or SMS – the use case is the same.
- User B is able to receive messages from User A, and make phone calls.

5.1.4 Post-conditions

User B places a call to the number provided by User A.

5.1.5 Normal Flow

The Normal flow would be as follows:

- 1) A composes a message to B.
- 2) During the composition of the message, A chooses an option to 'Insert Phone number' into the message. A chooses the phone number to insert, and continues composition.
- 3) A sends the completed message to B.
- 4) B reads the message, highlights the Telephone number and then places a Call.

In Step 2 a human readable URI would be included, e.g. "tel:+123456789". In Step 4 B's device recognises this as a telephone number due to the defined grammar of the URI Schemes work item, and the presence of the "tel:" URI scheme.

5.1.6 Alternative Flow

Step 2: The user has the message signature set, containing the text "tel:+123456789", and this is used by B to place a call to A in step 4.

In step 4: User B is given a chance to edit the number before the call is established. For example, the number in the message may be a local or private number (without the leading "+") instead of a global number (with the leading "+"); the message may be sent from across countries.

In step 4: User B is given a chance to invoke other functions on the number, in addition to placing a call. For example, the user can save the number to the phone book.

5.1.7 Operational and Quality of Experience Requirements

5.2 Initiating a Telephony call from within the Browser

5.2.1 Short Description

This use case describes the situation where User A is browsing the mobile web site of Content Provider B and wishes to contact someone via a Telephony call. Content Provider B has provided the necessary mechanism in a 'Contact Us' page within their site.

5.2.2 Actors

There are two actors in this Use Case:

- 1) User A
- 2) Content Provider B

5.2.2.1 Actor Specific Issues

5.2.2.2 Actor Specific Benefits

User A is able to place a telephone call directly to the Content Provider B without having to copy the number from the page and into the phone again.

5.2.3 Pre-conditions

Content Provider B has generated their 'Contact Us' page in accordance with the URI Schemes work item specifications, and User A's handset has been implemented to interpret these schemes.

5.2.4 Post-conditions

User A places a call to the number defined by Content Provider B.

5.2.5 Normal Flow

In the Normal flow the following happens:

- 1) Content Provider B's web site contains a Contact Us page which uses a hyperlink to a URI Scheme defined by this Work Item.
- 2) User A browses Content Provider B's web site and clicks on the 'Call Us' link.
- 3) The device confirms that User A wishes to place a telephony call, and then connects User A to the number provided within the link.

5.2.6 Alternative Flow

As an alternative flow, it should be possible to initiate a call through the IP network, rather than through the PSTN network. This requires the specification of a preferred transport as part of the scheme specification.

5.3 Sending a Message from within the Browser

5.3.1 Short Description

This use case describes the situation where User A is browsing the mobile web site of Content Provider B and wishes to send some information to the Content Provider using messaging. Content Provider B has provided the necessary mechanism in a 'Contact Us' page within their site.

5.3.2 Actors

There are two actors in this Use Case:

- 3) User A
- 4) Content Provider B

5.3.2.1 Actor Specific Issues

5.3.2.2 Actor Specific Benefits

5.3.3 Pre-conditions

Content Provider B has generated their 'Contact Us' page in accordance with the URI Schemes work item specifications, and User A's handset has been implemented to interpret these schemes.

5.3.4 Post-conditions

User A composes a message to the address defined by Content Provider B.

5.3.5 Normal Flow

In the Normal flow the following happens:

- 1) Content Provider B's web site contains a Contact Us page which uses a hyperlink to a URI Scheme defined by this Work Item. The URI scheme is different depending on which message type B wishes the use. For e-mail the de facto URI scheme "mailto:info@example.com" is used. Other schemes are used for SMS and MMS.

- 2) User A browses Content Provider B's web site and clicks on the 'Send Us a Message' link.
- 3) The device presents User A with a Composer window, which depends on the message type, but with the To: field already completed.
- 4) User A then composes his message and chooses "Send"
- 5) Content Provider B then receives the message that User A composed.

5.3.6 Alternative Flow

In the Alternative Flow the Content Provider's web site contains the messaging URI in plaintext and not within a hyperlink definition. In this case the device recognises the URI scheme and the grammar defined by this work item, and allows the user to highlight this text as a link and proceed as before.

In step 1: Content Provide B is able to prefill the "subject" and "body" parameters, in addition to the "to" parameter. The values are presented to User A in step 3.

5.4 Integrating a Messaging-based Value-added service with the Browser

5.4.1 Short Description

This use case describes the situation where User A is browsing the mobile web site of Content Provider B and the content provider runs an existing service using value added messaging – e.g. Send a Text for a ringtone. Content Provider B has provided the necessary mechanism in within their site. In the Content Providers service the contents and structure of the text message sent are important so the user does not get to edit the message.

5.4.2 Actors

There are two actors in this Use Case:

- 1) User A
- 2) Content Provider B

5.4.2.1 Actor Specific Issues

5.4.2.2 Actor Specific Benefits

5.4.3 Pre-conditions

Content Provider B has generated their web site in accordance with the URI Schemes work item specifications and has a Value added service based on messaging technologies (e.g. SMS). User A's handset has been implemented to interpret these schemes.

5.4.4 Post-conditions

User A receives the Value-added service provided by Content Provider B's messaging-based value added service.

5.4.5 Normal Flow

In the Normal flow the following happens:

- 1) Content Provider B's web site contains a page which uses a hyperlink to a URI Scheme defined by this Work Item.
- 2) User A browses Content Provider B's web site and clicks on the 'Request Ringtone' link.

- 3) The device presents User A with a notification that this action will result in an SMS being sent.
- 4) User A then confirms this is ok.
- 5) Content Provider B's Value-added service then receives the message with the contents defined on the web site.
- 6) Content Provider B's Value-added service responds in the usual way to this request.

5.4.6 Alternative Flow

In the Alternative Flow the Content Provider's web site contains the messaging URI in plaintext and not within a hyperlink definition. In this case the device recognises the URI scheme and the grammar defined by this work item, and allows the user to highlight this text as a link and proceed as before.

5.5 Submitting an XHTML form to an email account

5.5.1 Short Description

Content Provider B lets User A fill in an XHTML form in the Browser and submit the form data as an email to an email account (e.g. subscribe@example.com). The form data is mapped to the email format.

5.5.2 Actors

There are two actors in this Use Case:

- 1) User A
- 2) Content Provider B

5.5.2.1 Actor Specific Issues

5.5.2.2 Actor Specific Benefits

5.5.3 Pre-conditions

User A is able to send emails from the phone; i.e. the email client is set up with the right configuration settings.

Content Provider B has an email account to which User A is able to send emails.

5.5.4 Post-conditions

Content Provider B receives an email with the form data entered by User A.

5.5.5 Normal Flow

In the Normal flow the following happens:

1. Content Provider B's Web site contains an XHTML page with a form.
2. User A navigates to Content Provider B's Web site and fills in the form.
3. User A selects the "Submit"-button in the XHTML page to submit the form.
4. User A's email composer (client) is launched. The email contains the data that User A just entered into the form, in addition to the destination e-mail address, which is Content Provider B's address.
5. User A selects "Send" to send the email.
6. User A continues browsing from the page with the form.

5.5.6 Alternative Flow

5.6 Presence Signup from within a web page

5.6.1 Short Description

This use case describes how one actor may make the ability to track his/her presence available from within a web page.

5.6.2 Actors

User A – a mobile user who wants to sign up to receive User B’s presence information.

User B – a person who wants to selectively allow others to know his/her presence information.

5.6.2.1 Actor Specific Issues

User B must be able to control who ultimately has access to private presence information.

5.6.2.2 Actor Specific Benefits

5.6.3 Pre-conditions

User B creates a “home” web page which has a link allowing anyone to sign up to receive presence information about user B.

User A is using a web browser from his/her mobile.

5.6.4 Post-conditions

User A has now added User B to his/her presence application, and is able to receive presence updates about User B

5.6.5 Normal Flow

A hyperlink in User B’s web page allows for the initiation of the process of signing up for presence events generated by User B. User A is searching the web, and comes upon User B’s website. She sees that there is a hyperlink for connecting to User B’s presence info. User A clicks the link, and the presence application (if available) is started on User A’s device. This presence application is given the URI (identification) information for User B, that is embedded in the URI. The presence application on User A’s device then takes over, using standard presence protocol as encapsulated in the presence application. Note : from here on, this is out of scope of the URI scheme. User B receives the request, as a presence request transaction, and decides to allow User A to have access to presence events. These events need to be registered by User A’s presence application.

5.6.6 Alternative Flow

5.7 Initiating an Instant Messaging Session from within a contact record

5.7.1 Short Description

This use case describes using a record in a contact book which points to another user’s instant messaging access. By selecting the IM entry in the contact record, an instant messaging session is initiated between two users.

5.7.2 Actors

User A – a mobile user who wants to start an IM session with a friend.

User B – another user, probably a friend of user A.

5.7.2.1 Actor Specific Issues

Both users must support interoperable instant messaging applications.

5.7.2.2 Actor Specific Benefits

Initiation of an IM session is a “one button” operation. The initiating user does not have to remember phone numbers, or other identifying information.

5.7.3 Pre-conditions

User A must have User B’s contact information already available in his/her contact book.

5.7.4 Post-conditions

User A and User B conduct an IM session

5.7.5 Normal Flow

User A locates User B’s contact record in his contact book. User A selects the IM entry in the contact. Because the IM record is, or represents a URI describing User B’s access through instant messaging, an application which is responsible for initiating an instant messaging session is started. The application is seeded with the data found in the URI.

5.7.6 Alternative Flow

6. Requirements

(Normative)

6.1 High-Level Functional Requirements

Label	Description	Enabler Release
URI-1	It SHALL be possible to initiate a voice telephony call using any of the available bearers, from another application or service.	
URI-2	It SHALL be possible to initiate a video telephony call using any of the available bearers, from another application or service.	
URI-3	It SHALL be possible to compose and send an e-mail message from another application or service.	
URI-4	It SHALL be possible to initiate the composition and sending of an SMS message from another application or service.	
URI-5	It SHALL be possible to initiate the composition and sending of an MMS message from another application or service.	
URI-6	It SHALL be possible to initiate presence, instant messaging or related transactions that use the SIP protocol from another application or service.	
URI-7	It SHALL be possible to initiate the sending of an IM message from another application or service using pre-set header information (destination, text, other parameters) without transferring control to a separate IM session-based application.	
URI-8	URI schemes previously specified or used by OMA (e.g. "wtai", "pict", "efi", "cid", "http", and "https") MUST be documented and, if necessary, their use and handling SHOULD be clarified.	
URI-9	URI schemes for messages MUST include the ability to specify the destination addresses and the default message contents (subject and body), and SHOULD include a flag indicating whether the contents are visible and/or editable by the user.	
URI-10	URI schemes MUST allow for both Hypertext and Plaintext usage (the former being identified by the markup language, the latter being identified through parsing and matching against the formal grammar defined by this work item). Hypertext usage includes URI schemes in link elements (<a>, <link>), form elements (<form>), and object elements (, <object>).	
URI-11	URI schemes SHOULD be applicable to all user agents specified by OMA (e.g. Browser and MMS). If necessary, the use and handling of a URI scheme within a particular user agent SHOULD be clarified.	

Table 1: High-Level Functional Requirements

6.1.1 Security

Label	Description	Enabler Release
URI-12	URI schemes MUST NOT permit behaviors that can obviously be abused for fraudulent purposes (e.g. must not permit placing phone calls or sending messages without user's knowledge).	
URI-13	URI handlers MUST honour the security semantics defined for the URI scheme (e.g. using a secure connection for "https").	

6.1.2 Charging

Label	Description	Enabler Release
URI-14	URI handlers MUST NOT initiate chargeable actions (e.g. placing telephony calls) without explicit end-user confirmation.	

Table 2: High-Level Functional Requirements – Charging Items

6.1.3 Administration and Configuration

No requirements have been identified.

Label	Description	Enabler Release

Table 3: High-Level Functional Requirements – Administration and Configuration Items

6.1.4 Usability

Label	Description	Enabler Release
URI-15	URI schemes MUST appear human readable in their simplest forms.	

Table 4: High-Level Functional Requirements – Usability Items

6.1.5 Interoperability

Label	Description	Enabler Release
URI-16	The syntax for URI schemes MUST conform to the generic URI syntax defined in [RFC3986].	
URI-17	The character encoding of URI schemes MUST conform to the internationalized character encoding rules defined in [RFC3986]; the use of UTF-8 to support non-ASCII characters.	
URI-18	The definition of URI schemes MUST identify the minimum set of mandatory query parameters. (See [RFC3986] for the definition of query parameter.)	
URI-19	The handling of URI schemes MUST be consistent for all user agents. This includes the handling of unknown URI schemes and encoding rules (e.g. character encoding and %HH-encoding).	

Table 5: High-Level Functional Requirements – Interoperability Items

6.1.6 Privacy

Label	Description	Enabler Release
URI-20	URI schemes MUST NOT permit behaviors that violate end-user Privacy.	

Table 6: High-Level Functional Requirements – Privacy Items

6.2 Overall System Requirements

Label	Description	Enabler Release
URI-21	The definition of URI schemes MUST be consistent with and leverage existing work from other relevant standards bodies (e.g. IETF).	

Table 7: High-Level System Requirements

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
OMA-MAG-MAE-2003-0123-Requirements-URI-Schemes-200	26 Jan 2004	Whole document	Based on original proposal by Stephen Price, Vodafone.
Draft versions OMA-RD_URI-Schemes-V1_0	24 Feb 2004	Whole document	Updated after Beverly Hills meeting.
	24 Feb 2005	4,5,6,A	Added new use case, ported to 2005 OMA template
	14 Apr 2005	5.7, 6.	Added new use case (5.7). Put requirements in table format as requested at Requirements Informal Review.
Candidate versions OMA-RD_URI-Schemes-V1_0	30 Aug 2005	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2005-0260-URI-Schemes-RD-for-Approval