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Abstract:
This document contains the normative specifications for XRI contact service – a means of using an XRI as a long-term, privacy-protected point-of-contact on the Internet.

Status:
This document is a Working Draft and may be subject to further revision at any time. Subsequent versions will be identified by a new version identifier and date (reflected in a new document i-name and i-number).

Comments should be posted to the appropriate page of the XDI.org I-Services Specifications (ISS) wiki at http://iss.xdi.org, or submitted to the ISS Comment mailing list at http://lists.xdi.org/listinfo.cgi/iss-comment-xdi.org.

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1 Introduction

The purpose of the XDI.org Contact Service Specification is to define a service for providing a public *contact page*—a Web page addressable via an XRI in HTTP form—that allows the Contact Page owner (called the Recipient) to receive Contact Requests from Senders provided that the Sender satisfies authentication rules and any other filtering rules specified by the Recipient.

1.1 Related Specifications

This specification has a dependency on the following specifications.

- *The OASIS XRI Specifications* specified by the OASIS XRI Technical Committee, including XRI Syntax 2.0 **[XRISyntax]**, XRI Resolution 2.0 **[XRIResolution]**, and XRI Metadata 2.0 **[XRIMetadata]**. These specifications govern the technical interoperability of XRI identifiers and resolution protocols.
- *The XDI.org OpenID Authentication Service Specification* as defined on the XDI.org ISS website at **[XDI.orgISS]**.
- *The XDI.org SAML Authentication Service Specification* as defined on the XDI.org ISS website at **[XDI.orgISS]**.

1.2 Terminology and Notation

1.2.1 Definitions

All terms used in this specification as First Letter Uppercase or as an all-uppercase abbreviation are defined in Appendix A. This specification also includes by reference the XRI glossary as specified in Appendix C of **[XRISyntax]** and the XDI.org Global Services Specifications Definitions as specified in Appendix A of **[XDI.orgGSS]**.

1.2.2 Keywords

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]**. When these words are not capitalized in this document, they are meant in their natural language sense.

1.2.3 ABNF Notation

All ABNF (Augmented Backus-Naur Form) in the GSS uses the notation defined in **[RFC2234]**. Note that a number of standard ABNF productions, including the HEXDIG production, are also defined in RFC 2234.

ABNF productions are in indented green text as shown below.

```
example         = this is an example production
```

1.2.4 Examples

Example XRIs or XML documents in this specification are in indented grey text as shown below.

```
xri://example.xri.authority/(+example.path)
```

1.2.5 Variables

All items that appear inside squiggly brackets "{ }" are variables that do *not* include the squiggly brackets.

1.2.6 XRIs and HXRIs

All XRIs used in this specification are shown in XRI-normal form as defined in **[XRISyntax]**. All such XRIs can be converted to the equivalent IRI-normal form or URI-normal form as defined in **[XRISyntax]**. In addition, all such XRIs may be expressed in an HTTP URI format (called an *HXRI*) by prefixing the the URI-normal form of the XRI string (called the query XRI or *QXRI*) with the address of the XDI.org XRI proxy resolver `http://xri.net` or any other valid XRI proxy resolver address. Note that QXRIs SHOULD NOT use the prefix `xri://`. Following are two example HXRIs.

```
http://xri.net/=example.person
http://xri.net/@example*xri*authority/(+example.path)
```

2 Contact Service Endpoints

2.1 Contact Service Endpoint Metadata

Table 1 defines the requirements for a Contact Service Endpoint conforming to this specification. This information is also published on http://iss.xdi.org/moin.cgi/IserviceEndpointDefinitions, however Table 1 is authoritative.

Element	Required/ Optional	Element Value	Attribute Value
ProviderID	See note 1	I-Number of Contact Service Provider	N/A
Type #1	Required	`xri://+i-service*(+contact)*($v*1.0)`	`select="true"`
Type #2	See note 2	Empty element	`match="null"`
Media Type	See note 3	Empty element	`match="default"`
Path #1	Required	`(+contact)`	`select="true"`
Path #2	See note 2	Empty element	`match="null"`
URI	Required	URI to contact page (see notes 4 and 5)	See section 2.2

Deleted: `default`

Table 1: Requirements for a Contact Service Endpoint conforming to this specification.

Notes:

1. XDI.org-Accredited I-Brokers and their authorized resellers are REQUIRED to have a ProviderID in the form of a valid global or community i-number as defined in section 4.3.1 of **[XDI.orgGSS]**. This value SHOULD be used as the ProviderID for a Contact Service Endpoint for which the XDI.org-Accredited I-Broker or authorized reseller is the Contact Service Provider. (It is anticipated that in future versions of this specification, this ProviderID value will be REQUIRED for trust verification purposes.) Other trust networks may set their own requirements for this element.

2. These settings are RECOMMENDED in order to make Contact Service the default service endpoint if the QXRI has no service type and/or no path. For example, `http://xri.net/=person` will be automatically redirected by the `http://xri.net` proxy resolver to the Contact Service Endpoint for `=person` because the QXRI `=person` has no service type and no path. This behavior is provided by the empty Type element with the attribute `match="null"` and the empty Path element with the attribute `match="null"`. See the service endpoint selection rules in section 8 of **[XRIResolution]**.

Deleted: `default`

3. The Media Type element is only required if another Media Type element is also specified for this endpoint; otherwise it is optional because the implied value of the match attribute if no Media Type element is present is `match="default"`.

4. Use of an HTTPS URI in addition to a HTTP URI is OPTIONAL but RECOMMENDED.

5. For Contact Service Providers, the RECOMMENDED third-level DNS hosting name for Contact Service is `contact`, e.g. `contact.example.com`.

2.2 Use of the URI Append Attribute

The use of the `append` attribute for the URI element in a Contact Service Endpoint enables a different Contact Page to be displayed for each i-name (or i-number) that resolves to the same XRI authority. Because a Recipient may have multiple i-names registered to the same XRI authority, and these i-names may have different semantic contexts (e.g., professional vs. informal, childhood vs. adult), Contact Service Providers SHOULD offer customers the option of displaying a different Contact Page for each i-name register to the same XRI authority.

163   Either of the following two values of the `append` attribute MAY be used for this purpose:

164   •   `append="authority"`, which instructs XRI resolvers to pass only the authority
165   component of the QXRI.

166   •   `append="qxri"`, which instructs XRI resolvers to pass the entire QXRI. This value is
167   RECOMMENDED for maximum flexibility and interoperability with future versions of this
168   specification.

169   Note that one of these two values MUST be used to satisfy the Recipient identifier requirement
170   (section 3.2.1). The latter value SHOULD be used only if a Contact Service Provider enables
171   Recipients to specify Contact Page selection using the local part (path or query component) of a
172   QXRI.

2.3   Examples

173

174   Figure 1 is an example of a Contact Service Endpoint that uses `append="authority"` and is
175   configured to be the default service endpoint selected if the QXRI has no path. For example, this
176   service endpoint would be selected if the QXRI was `=example.name`.

```
177        <Service>
178              <Type select="true">
179              xri://+i-service*(+contact)*($v*1.0)
180              </Type>
181              <Type match="null"/>
182              <Path>(+contact)</Path>
183              <Path match="null"/>
184              <URI append="authority">http://contact.example.com/</URI>
185              <URI append="authority">https://contact.example.com/</URI>
186        </Service>
```

| Deleted: default |

187   Figure 1: Example Contact Service Endpoint #1.

188   Figure 2 is an example of a Contact Service Endpoint that uses `append="qxri"` and is NOT
189   configured to be the default service endpoint selected if the QXRI has no path. For example, this
190   service endpoint would only be selected if the QXRI was `=example.name/(+contact)`.

```
191        <Service>
192              <Type select="true">
193              xri://+i-service*(+contact)*($v*1.0)
194              </Type>
195              <Type match="null"/>
196              <Path>(+contact)</Path>
197              <URI append="qxri">http://contact.example.com/</URI>
198              <URI append="qxri">https://contact.example.com/</URI>
199        </Service>
```

| Deleted: default |

200   Figure 2: Example Contact Service Endpoint #2.

3   Contact Pages

This section defines the functional requirements for Contact Pages conforming to this specification.

3.1   Format

A Contact Page SHOULD be HTML/XHTML that validates against the **W3C Markup Validation Service** at http://validator.w3.org/.

The Contact Page MAY contain an HTML/XHTML form, called a Contact Form, that conforms to the requirements in section 3.5. If it does not contain a Contact Form, it SHOULD contain human-readable instructions for how the Recipient may be reached via some other communications channel.

3.2   Identifiers

3.2.1   Recipient

For visual verification and anti-spoofing, a Contact Page MUST prominently and unambiguously display the i-name or i-number of the Recipient that was used to retreive the Contact Page (provided using the URI `append` attribute – see section 2.2). It MAY display other i-names or i-numbers registered to the Recipient (see section 4). Note that if these other i-names or i-numbers are not XRIs for which the Contact Service Provider is authoritative, the Contact Service Provider MUST authenticate that the Recipient controls the XRI as defined in section 4.1. A Contact Page MUST NOT display any i-names or i-numbers the Recipient does not control (with the exception of those for the Contact Service Provider as defined below).

3.2.2   Contact Service Provider

For visual verification and assurance, a Contact Page from a Contact Service Provider who is a member or authorized reseller of the XDI.org-Accredited I-Broker network SHOULD prominently and unambiguously display:

1. The i-name, legal name, ProviderID, and logo of the Contact Service Provider.
2. The XDI.org-Accredited I-Broker logo.
3. An active link to the Contact Service Provider's own home page or Contact Page. This SHOULD be an XRI in the form of an HXRI.

3.3   Self-Description

A Contact Page MAY contain a self-description of the Recipient. This self-description MAY contain HTML/XHTML including i-links (HXRI-based links) or external URLs as desired by the Recipient.

3.4   Search Metadata

A Contact Page MAY contain HTML/XHTML header metadata that is not visible but used as metadata for search engines. Unless the Recipient prefers to be located via another resource (such as a forwarding index page **[ISS-Forwarding]**), it is RECOMMENDED that Contact Service Providers offer this functionality as it can make it significantly easier for a Recipient's Contact Page to be located by potential contacts.

3.5 Contact Form Input Fields

If a Contact Page contains a Contact Form, it MUST conform to the requirements in this section.

Input fields SHOULD be labelled with the subsection headings below, or the localized equivalent if the page is not in English.

The Recipient MAY have configuration control over whether completion of these fields is optional or required for a Sender.

A Contact Form MAY have other input fields besides those specified in this section.

3.5.1 Sender I-Name

A Contact Form MUST include a text input field for entry of an XRI identifying the Sender.

This field MUST recognize all valid forms of an absolute XRI as defined by **[XRISyntax]**, i.e., it must recognize an i-name or i-number typed either with or without an `xri://` prefix or an HXRI prefix such as `http://xri.net.`

This field SHOULD accept an i-name in any character script supported by the GRS and convert it to XRI-normal form as defined in **[XRISyntax]**.

If an XRI is ambiguous (for example, if the global context symbol is not present), the contact service provider SHOULD return an error and ask the Sender to enter an unambiguous string.

3.5.2 Sender Display Name

A Contact Form SHOULD include a text input field for entry of the name the Sender wishes the Contact Service Provider to display to the Recipient. If this string contains non-ASCII characters, the contact service provider SHOULD convert this input string into UTF-8.

3.5.3 Sender Email Address

A Contact Form SHOULD include a text input field for entry of the email address of the Sender. The Contact Service Provider SHOULD validate that the input is a valid email address per **[RFC2822]**.

3.5.4 Sender SMS Address

A Contact Form MAY include a text input field for entry of the SMS address of the Sender. The Contact Service Provider SHOULD validate that the input is a valid telephone number per **[RFC3966]**.

3.5.5 Message

A Contact Form MUST include a text area field for entry of the message the Sender wants to transmit to the Recipient. This field MAY include support for HTML/XHTML elements.

Entry of this field SHOULD be OPTIONAL, however if left empty, the Contact Service Provider SHOULD return an error and ask the Sender to confirm that he/she intended to send an empty message.

3.6 Instructions

A Contact Page SHOULD provide the following instructions to Senders:

1. How to use the Contact Form as a means to deliver an authenticated message to the Recipient.

2. How the authentication rules selected by the Recipient will be applied to the Sender's input. For example, if a Recipient requires *either* an i-name or an email address, the

279   instructions should explain that email address verification will be used if an i-name is not
280   supplied.
281   3. Guidance explaining that if the Sender does not supply an email or SMS address, the
282   Recipient will only be able to reply via the Sender's own Contact Page or another XRI-
283   based messaging service.

4 Sender Authentication

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It is RECOMMENDED that Contact Service Providers and Recipients only accept Contact
Requests if either the i-name or email address of the Sender (or both) can be authenticated. This
section defines these authentication requirements.

4.1 I-Name Authentication

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The Sender's i-name (or any other form of absolute XRI) MUST be authenticated by resolving the
Sender's XRI to discover the Sender's Authentication Service Endpoint(s) and then selecting and
using an endpoint that supports an XDI.org-approved Authentication Service as published on
[XDI.orgISS]. Currently this includes **[ISS-Auth-OpenID]** and **[ISS-Auth-SAML]**.

4.2 Email or SMS Address Authentication

293

The Sender's email or SMS address SHOULD be authenticated using closed-loop authentication
as defined by http://en.wikipedia.org/wiki/Closed-loop_authentication. However a Contact Service
Provider MAY use any other means of email or SMS address authentication that provides
reasonable assurance that the address is controlled and authorized by the Sender.

5 Contact Request Acknowledgements

Since use of a Contact Page may be a new experience to a Sender, it is important that a Contact Service Provider accurately inform the Sender of the status of a Contact Request. It is RECOMMENDED that after a Contact Request is submitted, a Contact Service Provider:

- Acknowledge if authentication of the Sender's address authentication was successful (or, if not successful, inform the Sender what they must do to achieve success).
- Explain what action will be taken by the Contact Service Provider to notify the Recipient of the Contact Request.

6 Contact Responses

It should be easy for a Recipient to respond to a Contact Request. It is RECOMMENDED that a Contact Service Provider provide the Recipient with the following response options:

- *Reply directly from the Recipient's own email or SMS address* (if the Sender provided an email or SMS address). Although this will reveal the Recipient's own address, this is often acceptable if the Recipient trusts the Sender.

- *Reply via an anonymous email or SMS address provided by the Contact Service Provider*. Note that if this option is used, the Contact Service Provider SHOULD notify the Recipient of bounces or email processing errors on a response message, so the Recipient knows if their response was not received.

- *Reply via the Sender's Contact Page* (if the Sender provided their i-name or XRI), which the Contact Service Provider can confirm as specified in section 8. This option need not reveal the Recipient's email address or any other sensitive data, and the Sender can in turn reply back via the Recipient's Contact Page.

7 Configuration

The Contact Service Provider SHOULD provide a configuration interface that enables the Recipient to easily configure and activate their Contact Page(s) and manage their Contact Service.

If a Web configuration interface is offered, the Contact Service Provider MUST allow the Recipient to authenticate using one or more of the Recipient's Authentication Service Endpoints as defined by **[XDI.orgISS]**.

The configuration interface SHOULD at a minimum enable a Recipient to:

- Manage the public self-description to be displayed on each Contact Page.

- Specify the means by which the Recipient can be notified of Contact Requests by the Contact Service Provider (e.g., email addresses, SMS addresses, etc.)

The configuration interface MAY enable a Recipient to:

- Activate or deactivate the Recipient's Contact Page(s) – see section 8.

- Configure different Contact Pages for each i-name registered to the same XRI Authority representing the Recipient.

- Control the i-names and/or i-numbers that will be displayed on each Contact Page (subject to the requirement in section 3.2.1). Note that this MAY include the option to only display the i-name or i-number used to request the Contact Page.

- Control which Contact Form input fields are required or optional.

- Manage the search metadata describing each Contact Page.

- Control header and body metadata to be added by the Contact Service Provider to Contact Request notifications to simplify filtering and processing by the Recipient.

- Control the authentication or filtering rules applied to Contact Requests.

- Customize the instructions provided to Senders on the Contact Form.

- Add images to the Contact Page.

- Add i-links from the Recipient's Forwarding Service to the Contact Page.

The configuration interface MAY include additional features and functions not specified here.

8 Activation and Confirmation

Activation of a i-service may be independent of the provisioning of the service endpoint by an i-broker, so existence of a service endpoint in an XRDS document does not necessarily mean that the i-service is active. To enable other service providers and applications to confirm activation of an i-service, a Contact Service Provider MUST support the following self-description interface.

To indicate that a specified i-service is active on a service endpoint URI, an HTTP GET request to the fully-constructed service endpoint URI (see section 8.4 of **[XRIResolution]**) with a Accept header value of `text/uri-list` MUST return:

1. An HTTP status of `200 OK` (or a `3xx` redirect that ultimately results in a `200 OK`).

2. A valid, non-empty instance of a URI list **[RFC2483]** containing the URI identifying the service endpoint type as specified in Table 1. (Note that the URI list MAY also contain additional URIs identifying other service types that are also active on this same endpoint.)

Any other response, including a `404 Not Found`, a `406 Not Acceptable`, an empty URI list, or a URI list that does not include the URI identifying the specified service type, indicates the specified service type is not active on the endpoint.

9 Security and Privacy Considerations

9.1 Cross-Site Scripting (XSS)

When creating or processing a Contact Page or Contact Request, a Contact Service Provider SHOULD take precautions to prevent cross-site scripting attacks by filtering out the HTML metacharacters < and > and any other characters that may cause XSS vulnerability. For more information see http://en.wikipedia.org/wiki/Cross_site_scripting and http://www.cgisecurity.com/articles/xss-faq.shtml.

9.2 Anonymous Replies

As described in section 6, a Contact Service Provider may enable a Recipient to respond to a Sender anonymously. This enables a Recipient to protect the privacy of their concrete identifiers (phone number, email address, SMS address) until they are ready to enter a trust relationship.

10   Future Work

10.1   Contact Data Exchange

Currently this specification requires manual entry by the Sender of contact data attributes such as display name, email address, and SMS address. In subsequent versions this can be automated by an XRI-enabled, user-controlled data interchange protocol. **[ISS-Auth-OpenID]** contains some limited data exchange functionality that is expected to expand with future versions of the OpenID framework. This is also a primary purpose of the OASIS XDI data interchange specifications underway at OASIS—see **[OASISXDITC]**.

10.2   I-Mail

Contact Service is the first step towards full XRI-based authenticated messaging, commonly known as *i-mail*. For more on the potential of i-mail, see http://www.inames.net/service_future.html. It is anticipated that the features of Contact Service will be integrated directly into i-mail.

11 References

11.1 Normative

[ISS-Auth-OpenID]   D. Reed, *OpenID Authentication Service V1.0*, XDI.org I-Services Specification, http://iss.xdi.org, Work-In-Progress.

[ISS-Auth-SAML]   P. Davis, *SAML Authentication Service V1.0*, XDI.org I-Services Specification, http://iss.xdi.org, Work-In-Progress.

[ISS-Forwarding]   D. Reed, *Forwarding Service V1.0*, XDI.org I-Services Specification, http://iss.xdi.org, Work-In-Progress.

[RFC2119]   S. Bradner, *Key words for use in RFCs to Indicate Requirement Levels*, http://www.ietf.org/rfc/rfc2119.txt, RFC 2119, March 1997.

[RFC2234]   D. H. Crocker and P. Overell, *Augmented BNF for Syntax Specifications: ABNF*, http://www.ietf.org/rfc/rfc2234.txt, RFC 2234, November 1997.

[RFC2483]   M. Meallling, R. Daniel Jr., *URI Resolution Services Necessary for URN Resolution,* http://www.ietf.org/rfc/rfc2483.txt, RFC 2483, January 1999.

[RFC2822]   P. Resnick, *Internet Message Format*, http://www.ietf.org/rfc/rfc2822.txt, RFC 2822, April 2001

[RFC3966]   H. Schulzrinne, *The tel URI for Telephone Numbers*, http://www.ietf.org/rfc/rfc3966.txt, RFC 3966, December 2004.

[XRIEPP]   NeuStar Registry Development Group, *EPP XRI Mapping*, http://epp-ver-04.sourceforge.net/XRI/, March 2006.

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[XRIResolution]   G. Wachob et al, *Extensible Resource Identifier (XRI) Resolution V2.0*, (Work-in-Progress), http://www.oasis-open.org/committees/download.php/17293, March 2006.

[XRIMetadata]   D. Reed, *Extensible Resource Identifier (XRI) Metadata V2.0*, [http://www.oasis-open.org/committees/xri], March 2005.

11.2 Informative

[XRIFAQ]   OASIS XRI Technical Committee, *XRI 2.0 FAQ*, http://www.oasis-open.org/committees/xri/faq.php, November 2005.

12 Links

419   **[XDI.org]**   http://www.xdi.org
420   **[XDI.orgContact]**   http://xri.net/@xdi.org/(+contact)
421   **[XDI.orgGSS]**   http://gss.xdi.org
422   **[XDI.orgISS]**   http://iss.xdi.org
423   **[OASISXRITC]**   http://www.oasis-open.org/committees/xri
424   **[OASISXDITC]**   http://www.oasis-open.org/committees/xdi

425

426 Appendix A. Glossary

427 In addition to the definitons below, the GSS also incorporates by reference the glossary
428 definitions in the XRI Specifications (Appendix C of **[XRISyntax]**) and the XDI.org Global
429 Services Specifications (Appendix A of **[XDI.orgGSS]**).

430

Authentication Service Endpoint	A service endpoint defined by an authentication service specification published by XDI.org on the **[XDI.orgISS]** website.
Contact Form	The HTML/XHTML form optionally included on a Contact Page to enable a Sender to send an authenticated message to a Recipient.
Contact Page	Generally, a web page that enables a Recipient to receive authenticated Contact Requests without revealing their email address or other private contact data. Technically, the HTML/XHTML page identified in an XRDS document by a Contact Service Endpoint.
Contact Service	The XRI identity service (i-service) defined in this specification—see section 1.
Contact Service Endpoint	An XRDS service endpoint containing the metadata defined in Table 1 of this specification.
Contact Service Provider	Generally, the real-world provider of Contact Service to a Recipient. Legally, an authorized representative of the legal entity identified by the ProviderID for the Contact Service Endpoint.
Recipient	The authority for an XRI that resolves to a Contact Page and receives Contact Requests from the Contact Form (if any).
Sender	The party initiating a Contact Request via a Contact Page containing a Contact Form.

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