ARI Registry Services

Universal RTK Toolkit—ARI Add-On Guide

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This document is provided pursuant to the disclaimer provided on the last page, and the following.

Revision History

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About ARI Registry Services

In October 2011, AusRegistry International evolved to a name and brand identity in a move to support the continued expansion of the organisation and position it as a dominant force in the global TLD Registry Services marketplace.

ARI Registry Services is now used as a trading name of the AusRegistry International corporate entity.

Document Purpose

The purpose of this document is to provide guidance on the implementation of the Universal RTK Toolkit Add-On provided by ARI Registry Services.

Document Scope

Intended Audience

This document is intended for use by the following:

Registrars

Registry Operators

Related Documents

Required Reading

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Introduction

ARI’s Universal RTK Toolkit Add-On extends the Universal RTK Toolkit, by providing extensions for:

DNSSEC information in Domain Create, Domain Update and Domain Info operations

IDN information in Domain Create and Domain Info operations, including IDN variants for Domain Info

Key value in Domain Create and Domain Update operations

Features

Specific technical features of the Add-On??

Setup

Environment

The following environment specifics are required:

Java 6

Java SE 6 (JDK6.0) or later

The Toolkit API was implemented in Java using only standard libraries (some of which are only standard with Java SE 6 or later) to minimise dependency on external resources.

Confirm the version of Java installed using:

java –version

UTF-8 Encoding

The Toolkit uses the Java VM default character set for character encoding. Consequently, the default character set must be UTF‐8 to properly parse and encode UTF‐8 characters in sent and received EPP messages. For English Windows machines, the default character set is typically Cp1252, and can be changed to UTF‐8 by setting the system property:

file.encoding to UTF-8.

This can be done on the command line with the syntax:

java –Dfile.encoding=UTF-8 ...

UTC Date

Date objects must be set to UTC time instead of local time.

Configuration

Properties

The Universal RTK Toolkit needs to be configured to access an ARI Domain Name Registry System (DNRS). This involves setting properties in two properties files provided by ARI’s RTK Toolkit Add-On:

*etc/rtk.properties*

*ssl/ssl.properties*

**rtk.properties**

The property in the *rtk.properties* file is *rtk.transport*. You will need to set this to: *ari.dnrs.rtk.addon.transport.EPPTransportTCPTLS*.

Using this setting also includes a fix to send the correct length of the XML when using Unicode characters.

**ssl.properties**

The properties in the *ssl.properties* file are as follows:

*ssl.keystore.file=  
ssl.truststore.location=  
ssl.truststore.pass=*

These properties identify the trust store to be used. Thus enabling changing the trust store independent of the JVM base trust store. The values of these properties are dependent on the Registrar. Values will be supplied by the Registry operator.

Logging

Deployment

James M: Think the setup section should mention that it has to be deployed alongside the other toolkit in same class path (a dev can help you here).

Coding Guide

DNSSEC Extensions

Via DNSSEC extensions, ARI’s Universal RTK Toolkit Add-On allows Registrars to:

Provide DNSSEC information in the Domain Create operation

Create a Domain Update request which includes DNSSEC information for an ARI backed EPPD and Registry

Process and identify the DNSSEC information of a Domain Info response that contains the Domain Name DNSSEC details from an ARI backed EPPD

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| Setting DNSSEC extensions as an EPP service extension  To use DNSSEC extensions with your Domain operations you will need to set them as an EPP service extension on your EPPClient object. You must do this before login. You can achieve this with the following code:  eppClient = new EPPClient(eppHostName, eppHostPort, eppClientID, password);  eppClient.setEPPServiceExtensions(new String[] { XMLNamespaces.SEC\_DNS\_NAMESPACE }); |

**Note:** More than one EPP service extension can be set to the EPP client at the time of login.

DNSSEC Information (Domain Create)

You can provide DNSSEC information in the Domain Create operation.

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| Performing Domain Create with DNSSEC Information  To perform a Domain Create with DNSSEC information, you will need an instance of the SECDNSCreateCommandExtension class. This class takes in an instance of a DNSSecDataBean using the setCreateData() method:  SECDNSCreateCommandExtension secDNSExt = new SECDNSCreateCommandExtension();  DNSSecDataBean createData = new DNSSecDataBean();  secDNSExt.setCreateData(createData); |
| Creating a Domain via KeyDataBean or DSDataBean classes  You can supply DNSSEC information to a Domain Create request by supplying a KeyDataBean or DSDataBean object.  **Adding KeyDataBean to DNSSecDataBean**  The following is an example of how to create a KeyDataBean object and add it to the DNSSecDataBean:  KeyDataBean keyData = new KeyDataBean();  keyData.setAlgorithm(3); |
| keyData.setPubKey("AQPJ////4Q==");  keyData.setProtocol(3);  keyData.setFlags(0);  createData.addToKeyData(keyData);  **Adding DSDataBean to DNSSecDataBean**  The following code is an example of how to create DSDataBean and add it to the DNSSecDataBean:  DSDataBean dsData = new DSDataBean();  dsData.setAlgorithm(1);  dsData.setDigest("49FD46E6C4B45C55D4D4D4D4D4D4D4D4D4D4D400");  dsData.setDigestType(1);  dsData.setKeyTag(1);  createData.addToDsData(dsData);  **Adding KeyDataBean to DSDataBean**  You can also add a KeyDataBean object to a DSDataBean object, to supply the Key Data that was used to generate the DS Data:  dsData.setKeyData(keyData); |
| Setting DNSSEC Information extension to the object  Prior to processing your Domain Create request you will need to set the extension to the object. The following code is a basic example of how to do this:  final epp\_DomainCreateReq domainCreateRequest = new epp\_DomainCreateReq();  /\* Complete any standard configuration for your domain create in addition to setting up your DNSSEC data here \*/  final epp\_Extension[] extensions = { secDNSExt };  domainCreateRequest.getCmd().setExtensions(extensions);  EPPDomainCreate domainCreate = new EPPDomainCreate();  domainCreate.setRequestData(domainCreateRequest); |

DNSSEC Information (Domain Update)

You can create a Domain Update request which includes DNSSEC information for an ARI backed EPPD and Registry.

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| Performing Domain Update with DNSSEC Information  To perform a Domain Update with DNSSEC information, you will need an instance of the SECDNSUpdateCommandExtension class:  SECDNSUpdateCommandExtension secDNSExt = new SECDNSUpdateCommandExtension(); |
| Adding or removing DNSSEC data  SECDNSUpdateCommandExtension lets you provide add or remove DNSSEC data (DSDataBean or KeyDataBean).  **To add DSDataBean data**  The following example shows how to add DSDataBean data to a Domain Update:  DSDataBean dsDataToAdd = new DSDataBean();  dsDataToAdd.setAlgorithm(1);  dsDataToAdd.setDigest("49FD46E6C4B45C55D4D4D4D4D4D4D4D4D4D4D411");  dsDataToAdd.setDigestType(1);  dsDataToAdd.setKeyTag(1);  DNSSecDataBean addData = new DNSSecDataBean();  addData.addToDsData(dsDataToAdd);  secDNSExt.setAddData(addData);  **To remove DSDataBean data**  The following example shows how to remove DSDataBean data from a domain using Domain Update.  First you need to create your DSDataBean object, supplying the algorithm, digest, digest type and key tag (and optionally the related Key data) of the DNSSEC data that you wish to remove:  DSDataBean dsData = new DSDataBean();  dsData.setAlgorithm(1);  dsData.setDigest("49FD46E6C4B45C55D4D4D4D4D4D4D4D4D4D4D411");  dsData.setDigestType(1);  dsData.setKeyTag(1);  Next, you need to create a RemoveElementBean, and add the DSDataBean to that object. Then add RemoveElementBean to the SECDNSUpdateCommandExtension:  RemoveElementBean removeElement = new RemoveElementBean();  removeElement.addToDsData(dsData);  secDNSExtension.setRemData(removeElement);  **Adding and removing KeyDataBean data**  Adding and removing KeyDataBean data is a very similar process to adding and removing DSDataBean data. Instead of using a DSDataBean, simply add a KeyDataBean to the DNSSecDataBean.  See ‘DNSSEC Information (Domain Create)’ above, for an example of using a KeyDataBean.  **Removing all DSDataBean and KeyDataBean data**  You can also remove all DSDataBean data and KeyDataBean data related to a domain using a Domain Update. The following is an example of this:  RemoveElementBean remElement = new RemoveElementBean();  remElement.setRemoveAll(true);  secDNSExtension.setRemData(remElement); |
| Changing DNSSEC data maxSigLife value  SECDNSUpdateCommandExtension also lets you change the maxSigLife value for your DNSSEC data.  The following example shows how to change the maxSigLife of a domain's DNSSEC data:  MaxSigLifeBean maxSigLife = new MaxSigLifeBean(10000);  ChangeElementBean chgElement = new ChangeElementBean();  chgElement.setMaxSigLife(maxSigLife);  secDNSExtension.setChgData(chgElement); |
| Setting DNSSEC Information extension to the command object  Prior to processing your Domain Update request you will need to set the extension to the object. The following code is a basic example of how to do this:  final epp\_DomainUpdateReq domainUpdateRequest = new epp\_DomainUpdateReq();  /\*Complete any standard configuration for your domain update in addition to setting up your DNSSEC data here \*/  final epp\_Extension[] extensions = { secDNSExt };  domainUpdateRequest.getCmd().setExtensions(extensions);  EPPDomainUpdate domainUpdate = new EPPDomainUpdate();  domainUpdate.setRequestData(domainUpdateRequest); |

DNSSEC Information (Domain Info)

You can process and identify the DNSSEC information of a Domain Info response that contains the Domain Name DNSSEC details from an ARI backed EPPD.

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| Retrieving DNSSEC Information from Domain Info  To retrieve the DNSSEC information from Domain Info, you will need to first perform a Domain Info operation:  epp\_DomainInfoReq domainInfoRequest = new epp\_DomainInfoReq();  epp\_Command commandData = new epp\_Command();  commandData.setClientTrid("cltrid");  domainInfoRequest.setCmd(commandData);  domainInfoRequest.setName("domain.name");  EPPDomainInfo domainInfo = new EPPDomainInfo();  domainInfo.setRequestData(domainInfoRequest);  domainInfo = (EPPDomainInfo) eppClient.processAction(domainInfo);  Having completed the Domain Info, you can get the extension XML from the response:  final epp\_DomainInfoRsp domainInfoResponse = domainInfo.getResponseData();  final epp\_Response infoResponse = domainInfoResponse.getRsp();  String[] infoExtensionStrings = infoResponse.getExtensionStrings();  Then you can create the SECDNSInfoResponseExtension object to parse the XML:  SECDNSInfoResponseExtension secDNSInfoResponse = new SECDNSInfoResponseExtension();  secDNSInfoResponse.fromXML(infoExtensionStrings[0]);  You can then access the DS data, Key data and maxSigLife (be aware that these will be 'null' if the domain has no associated data):  List<DSDataBean> dsDataList = secDNSInfoResponse.getInfData().getDsDataList();  List<KeyDataBean> keyDataList = secDNSInfoResponse.getInfData().getKeyDataList();  MaxSigLifeBean maxSigLife = secDNSInfoResponse.getInfData().getMaxSigLife(); |

IDN Information Extensions

Via IDN Information extensions, ARI’s Universal RTK Toolkit Add-On allows Registrars to:

Perform a Domain Create with IDN information

Obtain the user form, language and canonical form of an IDN when executing Domain Info

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| Setting IDN Information extensions as an EPP service extension  To use the IDN Information extensions with your Domain operations you will need to set them as an EPP service extension on your EPPClient object. You must do this before login. You can achieve this with the following code:  eppClient = new EPPClient(eppHostName, eppHostPort, eppClientID, password);  eppClient.setEPPServiceExtensions(new String[] { XMLNamespaces.IDNA\_NAMESPACE }); |

IDN Information (Domain Create)

You can perform a Domain Create with IDN information.

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| Performing Domain Create with IDN information  First you will need an instance of the DomainIdnCommandExtension class:  DomainIdnCommandExtension idnExt = new DomainIdnCommandExtension();  Then, the DomainIdnCommandExtension class requires a user form and a language to be set:  idnExt.setUserForm(userForm);  idnExt.setLanguage(language);  Prior to processing your Domain Create request you will need to set the extension to the object. The following code is a basic example of how to do this:  final epp\_DomainCreateReq domainCreateRequest = new epp\_DomainCreateReq();  /\*Complete any standard configuration for your domain create in addition to setting up your key value data here \*/  final epp\_Extension[] extensions = { idnExt };  domainCreateRequest.getCmd().setExtensions(extensions);  EPPDomainCreate domainCreate = new EPPDomainCreate();  domainCreate.setRequestData(domainCreateRequest); |

IDN Information (Domain Info)

You can also obtain IDN information with a Domain Info operation.

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| Performing Domain Info to obtain IDN information  The Domain Info operation utilises the same extension as Domain Create for obtaining the extension response information. The following is an example for obtaining the IDN response information. First you need to obtain the extension XML:  String[] extensionStrings = response.getExtensionStrings();  Then, you need to parse the XML using a DomainIdnCommandExtension object:  DomainIdnCommandExtension domainIdnCommandExtension = new DomainIdnCommandExtension();  domainIdnCommandExtension.fromXML(extensionStrings[0]);  Finally, you can obtain the user form, language and canonical form from the command extension:  domainIdnCommandExtension.getUserForm();  domainIdnCommandExtension.getLanguage();  domainIdnCommandExtension.getCanonicalForm(); |

IDN Variant Extension

Via the IDN Variant extension, ARI’s Universal RTK Toolkit Add-On allows Registrars to:

Retrieve variant information in a response to a Domain Info request (if the registered IDN domain has variants)

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| Setting the IDN Variant extension as an EPP service extension  To use the IDN Variant extension with your Domain operations you will need to set it as an EPP service extension on your EPPClient object. You must do this before login. You can achieve this with the following code:  eppClient = new EPPClient(eppHostName, eppHostPort, eppClientID, password);  eppClient.setEPPServiceExtensions(new String[] {XMLNamespaces.VARIANT\_NAMESPACE}); |

IDN Variants (Domain Info)

You can view the variants of a registered IDN in an ARI Registry in response to Domain Info requests.

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| Requesting Domain Info  First you need to create a normal domain info request:  epp\_DomainInfoReq domainInfoRequest = new epp\_DomainInfoReq();  Then set command data and input the domain DNS form to the request:  epp\_Command commandData = new epp\_Command();  commandData.setClientTrid("cltrid");  domainInfoRequest.setCmd(commandData);  domainInfoRequest.setName("domain.name"); |
| Processing Domain Info  Process a Domain Info operation with the Domain Info request:  EPPDomainInfo domainInfo = new EPPDomainInfo();  domainInfo.setRequestData(domainInfoRequest);  domainInfo = (EPPDomainInfo) eppClient.processAction(domainInfo);  Once the Domain Info request has processed, you can retrieve response XML:  final epp\_DomainInfoRsp domain\_info\_response = domainInfo.getResponseData();  final epp\_Response response = domain\_info\_response.getRsp();  If the response XML contains any extension XML, you can also retrieve it:  final String[] extensionStrings = response.getExtensionStrings();  If the domain has any variants, the variant information is returned in the extension of the Domain Info response. You can parse this variant extension from the response XML, by using a DomainVariantCommandExtension object:  DomainVariantCommandExtension variantCommandExtension = new DomainVariantCommandExtension();  variantCommandExtension.fromXML(extensionStrings[0]); |
| You can then retrieve the variant information as a list of DomainVariantBean objects:  final List<DomainVariantBean> variantList = variantCommandExtension.getInfoVariantList();  The DomainVariantBean object holds the DNS form and user form of the variant. You can retrieve these values from the DomainVariantBean objects:  domainVariantBean.getName();  domainVariantBean.getUserForm(); |

Key Value Extensions

Via Key Value extensions, ARI’s Universal RTK Toolkit Add-On allows Registrars to:

Provide Key Value lists in Domain Create and Domain Update requests (the Domain Update XML has been extended to allow key value pairs)

Retrieve Key Value pairs of a domain using Domain Info requests

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| Setting Key Value extensions as an EPP service extension  To use Key Value extensions with your Domain operations you will need to set them as an EPP service extension on your EPPClient object. You must do this before login. You can achieve this with the following code:  eppClient = new EPPClient(eppHostName, eppHostPort, eppClientID, password);  eppClient.setEPPServiceExtensions(new String[] { XMLNamespaces.KVLIST\_NAMESPACE }); |

Key Value (Domain Create)

You can provide Key Value lists in Domain Create requests and Domain Update requests.

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| Using Domain Create with Key Value extension  To use Key Value data with Domain Create you need an instance of the DomainKVCommandExtension class. You will need to instantiate this with the name of the operation as a parameter:  final DomainKVCommandExtension kvExtension = new DomainKVCommandExtension("create"); |
| Setting Key Value extension to the object  Prior to processing your Domain Create request you will need to set the Key Value extension to the object. The following code is a basic example of how to do this:  final epp\_DomainCreateReq domainCreateRequest = new epp\_DomainCreateReq();  /\*Complete any standard configuration for your domain create in addition to setting up your key value data here \*/  final epp\_Extension[] extensions = { kvExtension };  domainCreateRequest.getCmd().setExtensions(extensions);  EPPDomainCreate domainCreate = new EPPDomainCreate();  domainCreate.setRequestData(domainCreateRequest); |
| Setting Key Value pair data  Key Value data needs to be set on the DomainKVCommandExtension object. This is achieved through the addKeyValuePairToList method. This takes the list name and key with its value as a parameter.  The list name needs to be specified each time a key and value is added. The following code is an example of how to add the pairs {eligibility / true}, {policyType / new} and {registrantName / Tester} to a list with the name AU:  kvExtension.addKeyValuePairToList("AU", "eligibility", "true");  kvExtension.addKeyValuePairToList("AU", "policyType", "1"); |
| kvExtension.addKeyValuePairToList("AU", "registrantName", "Tester"); |

**Note:** Multiple Key Value lists with different names can be set on the same extension using the same logic.

Key Value (Domain Update)

You can provide Key Value lists in Domain Update requests.

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| Providing Key Value lists  The following code shows how you can provide Key Value lists in Domain Update requests.  final DomainKVCommandExtension kvExtension = new DomainKVCommandExtension("update"); |

Key Value (Domain Info)

You can retrieve the key value pairs of a domain by using a Domain Info request.

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| Creating a Domain Info request  First create the Domain Info request:  epp\_DomainInfoReq domainInfoRequest = new epp\_DomainInfoReq();  Set command data and input domain name into the request:  epp\_Command commandData = new epp\_Command();  commandData.setClientTrid("cltrid");  domainInfoRequest.setCmd(commandData);  domainInfoRequest.setName("domain.name"); |
| Processing a Domain Info operation with a Domain Info request  Process a Domain Info operation with the Domain Info request:  EPPDomainInfo domainInfo = new EPPDomainInfo();  domainInfo.setRequestData(domainInfoRequest);  domainInfo = (EPPDomainInfo) eppClient.processAction(domainInfo);  Once the domain info request has been processed, you can retrieve response XML.  final epp\_DomainInfoRsp domain\_info\_response = domainInfo.getResponseData();  final epp\_Response response = domain\_info\_response.getRsp();  If the response XML contains any extension XML, you can retrieve it:  final String[] extensionStrings = response.getExtensionStrings(); |
| If the domain has any Key Value pairs, the Key Value list is returned in the extension of the Domain Info response. You can parse this key value extension from the response XML, using a DomainKVCommandExtension object as follows:  final DomainKVCommandExtension kvExtension = new DomainKVCommandExtension("info");  kvExtension.fromXML(extensionStrings[0]);  You can then retrieve Key Value Lists as list names mapped to a list of DomainKeyValueBean objects:  final HashMap<String, ArrayList<DomainKeyValueBean>> keyValueLists = kvExtension.getKeyValueLists();  You can then iterate through this collection to obtain the Key Value list names and the Key Value list items:  final List<DomainKeyValueBean> keyValueBeanList = keyValueLists.get("list- name");  final DomainKeyValueBean keyValueBean1 = keyValueBeanList.get(0);  The DomainKeyValueBean object holds the key and value. You can retrieve these values from the DomainKeyValueBean objects:  String key = keyValueBean1.getKey();  String value = keyValueBean1.getValue(); |

Variant Extension

Via Variant extensions, ARI’s Universal RTK Toolkit Add-On allows Registrars to:

Create a Domain Update request to add or remove variants of a registered Domain Name for an ARI backed EPPD and Registry

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| Setting the Variant extension as an EPP service extension  To use the Variant extension with your Domain operations you will need to set it as an EPP service extension on your EPPClient object. You must do this before login. You can achieve this with the following code:  eppClient = new EPPClient(eppHostName, eppHostPort, eppClientID, password);  eppClient.setEPPServiceExtensions(new String[] {XMLNamespaces.VARIANT\_NAMESPACE}); |

Variants (Domain Update)

You can perform a Domain Update request to add or remove variants of a Domain Name.

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| Using Domain Update with variant extension  To perform a Domain Update with variant extension, you will need an instance of the DomainVariantCommandExtension class:  final DomainKVCommandExtension kvExtension = new DomainKVCommandExtension("create"); |
| Adding or removing variants from a domain  DomainVariantCommandExtension lets you provide for variants to be added to or removed from a domain.  **To add variants**  You can set the DNS form and user form of a variant to be added to a domain, to a DomainVariantCommandExtension object as follows:  domainVariantExtension.addToVariantsToAddList(variantToAddDNSForm, variantToAddUserform);  **To remove variants**  You can set the DNS form and user form of a variant to be removed from a domain, to a DomainVariantCommandExtension object as follows:  domainVariantExtension.addToVariantsToRemoveList(variantToRemoveDNSForm, variantToRemoveUserform); |
| Creating a Domain Update request  You can create a Domain Update request and set the variant extension to the request as follows:  epp\_DomainUpdateReq domainUpdateRequest = new epp\_DomainUpdateReq();  domainUpdateRequest.setName(domainName);  domainUpdateRequest.setCmd(commandData);  // Set the extension to the Domain update request  final epp\_Extension[] extensions = {domainVariantExtension};  domainUpdateRequest.getCmd().setExtensions(extensions);  Then process the domain update request to send the request with the variant extension:  EPPDomainUpdate domainUpdate = new EPPDomainUpdate();  domainUpdate.setRequestData(domainUpdateRequest);  domainUpdate = (EPPDomainUpdate) eppClient.processAction(domainUpdate); |

Appendix

Specifications Implemented

RFCs

Other Extensions

Log File Format

Definition of AusRegistry

**AusRegistry** means any or all of the AusRegistry Group of companies, their related entities and their respective officers, employees, contractors or sub-contractors.

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