RPKI Engine

1.0

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1 RPKI Engine Reference Manual

This collection of Python modules implements a prototype of the RPKI Engine. This is a work in progress.

See http://subvert-rpki.hactrn.net/ for code and design documents.

The RPKI Engine is an implementation of the production-side tools for generating

certificates, CRLs, and ROAs. The `relying party tools` are a separate (and much simpler) package.

The Subversion repository for the entire project is available for (read-only) anonymous access at `http://subvert-rpki.hactrn.net/`.

The documentation you're reading is generated automatically by Doxygen from comments and documentation in `the code`.

Besides the automatically-generated code documentation, this manual also includes documentation of the overall package:

- Overview of the tools
- Installation instructions
- Configuration instructions
- MySQL setup instructions
- The myrpki tool
- A description of the left-right protocol
- A description of the publication protocol
- A description of the BPKI model used to secure the up-down, left-right, and publication protocols
- A description of the several SQL database schemas

This work was funded from 2006 through 2008 by `ARIN`, in collaboration with the other Regional Internet Registries. Current work is funded by DHS.

2 Overview

2.1 Terminology

A few special terms that appear often enough in code or documentation that they need explaining.

Todo

These explanations should be fleshed out properly.

IRBE:

Internet Registry Back End.

IRDB:

Internet Registry Data Base.

BPKI:

Business PKI.

RPKI:

Resource PKI.

2.2 Programs

At present the package is intended to be run out of the `rpkid/` directory.

In addition to the library routines in the `rpkid/rpki/` directory, the package includes the following programs:

- `rpkid:` The main RPKI engine daemon.
- `pubd:` The publication engine daemon.
- `rootd` A separate daemon for handling the root of an RPKI certificate tree. This is essentially a stripped down version of rpkid with no SQL database, no left-right protocol implementation, and only the parent side of the up-down protocol. It's separate because the root is a special case in several ways and it was simpler to keep the special cases out of the main daemon.
- `irdbd:` A sample implementation of an IR database daemon. rpkid calls into this to perform lookups via the left-right protocol.
- `smoketest:` A test tool for running a collection of rpkid and irdb instances under common control, driven by a unified test script.
- `yamltest:` Another test tool which takes the same input format as `smoketest.py`, but with slightly different purpose. `smoketest.py` is intended to support regression tests, while `yamltest.py` is intended for automated testing of something closer to a real operational environment. There's a fair amount of code duplication between the two, and at some point they will probably be merged into a single program that supports both modes of operation.

Most of these programs take configuration files in a common format similar to that used by the OpenSSL command line tool. The test programs also take input in YAML format to drive the tests. Runs of the `yamltest` test tool will generate a fairly complete set configuration files which may be useful as examples.

Basic operation consists of creating the appropriate MySQL databases (see MySQL Setup), configuring relationships between parents and children and between publication clients and repositories (see The myrpki tool), starting `rpkid`, `pubd`, `rootd`, and `irdbd`, and using the left-right and publication control protocols (see The myrpki tool) to set up rpkid's and pubd's internal state. All other operations should occur either as a result of cron events or as a result of incoming left-right and up-down protocol requests.

The core programs are all event-driven, and are (in theory) capable of supporting an arbitrary number of hosted RPKI engines to run in a single rpkid instance, up to the performance limits of the underlying hardware.

At present the daemon programs all run in foreground, that is, the daemons themselves make no attempt to put themselves in background. The easiest way to run the servers is to run the `start_servers` script, which examines your `rpki.conf` file and starts the appropriate servers in background using `rpki.conf` as the configuration file for each server as well.

If you prefer, you can run each server by hand instead of using the script, eg, using Bourne shell syntax to run rpkid in background:

```
$ rpkid &
$ echo >rpkid.pid  "$!"
```

All of the daemons use syslog by default. You can change this by running either the servers themselves or the `start_servers` script with the "-d" option. Used as an argument to a server directly, "-d" causes that server to log to `stderr` instead of to syslog. Used as an argument to `start_servers`, "-d" starts each of the servers with "-d" while redirecting `stderr` from each server to a separate log file. This is intended primarily for debugging.

Some of the options that the several daemons take are common to all daemons. Which daemon they affect depends only on which sections of which config files they are in. See Common Options for details.

2.2.1 rpkid

rpkid is the main RPKI engine daemon. Configuration of rpkid is a two step process: a config file to bootstrap rpkid to the point where it can speak using the left-right protocol, followed by dynamic configuration via the left-right protocol. The latter stage is handled by the `myrpki` tool.

rpkid stores dynamic data in an SQL database, which must have been created for it, as explained in the Installation Guide.

2.2.2 pubd

pubd is the publication daemon. It implements the server side of the publication protocol, and is used by rpkid to publish the certificates and other objects that rpkid generates.

pubd is separate from rpkid for two reasons:

- The hosting model allows entities which choose to run their own copies of rpkid to publish their output under a common publication point. In general, encouraging shared publication services where practical is a good thing for relying parties, as it will speed up rcynic synchronization time.

- The publication server has to run on (or at least close to) the publication point itself, which in turn must be on a publically reachable server to be useful. rpkid, on the other hand, need only be reachable by the IRBE and its children in the RPKI tree. rpkid is a much more complex piece of software than pubd, so in some situations it might make sense to wrap tighter firewall constraints around rpkid than would be practical if rpkid and pubd were a single program.

pubd stores dynamic data in an SQL database, which must have been created for it, as explained in the Installation Guide. pubd also stores the published objects themselves as disk files in a configurable location which should correspond to an appropriate module definition in rsync.conf; see the Configuration Guide for details.

2.2.3 rootd

rootd is a stripped down implmenetation of (only) the server side of the up-down protocol. It's a separate program because the root certificate of an RPKI certificate tree requires special handling and may also require a special handling policy. rootd is a simple implementation intended for test use, it's not suitable for use in a production system. All configuration comes via the config file; see the Configuration Guide for details.

2.2.4 irdbd

irdbd is a sample implemntation of the server side of the IRDB callback subset of the left-right protocol. In production use this service is a function of the IRBE stub; irdbd may be suitable for production use in simple cases, but an IR with a complex IRDB may need to extend or rewrite irdbd.

irdbd requires a pre-populated database to represent the IR's customers. irdbd expects this database to use the SQL schema defined in rpkid/irdbd.sql. Once this database has been populated, the IRBE stub needs to create the appropriate objects in rpkid's database via the control subset of the left-right protocol, and store the linkage handles (foreign keys into rpkid's database) in the IRDB. See the Installation Guide and the MySQL setup instructions for details.

2.2.5 smoketest

smoketest is a test harness to set up and run a collection of rpkid and irdbd instances under scripted control.

Unlike the programs described above, smoketest takes two configuration files in different languages. The first configuration file uses the same syntax as the above configuration files but is completely optional. The second configuration file is the test script, which is encoded using the YAML serialization language (see `http://www.yaml.org/` for more information on YAML). The YAML script is not optional, as it describes the test layout. smoketest is designed to support running a fairly wide set of test configurations as canned scripts without writing any new control code. The intent is to make it possible to write meaningful regression tests.

See smoketest.conf for what can go into the (optional) first configuration file.

See smoketest.yaml for what goes into the (required) second configuration file.

2.2.6 yamltest

yamltest is another test harness to set up and run a collection of rpkid and irdbd instances under scripted control. It is similar in many ways to `smoketest` , and in fact uses the same YAML test description language, but its purpose is different: `smoketest` runs a particular test scenario through a series of changes, then shuts it down; `yamltest`, on the other hand, sets up a test network using the same tools that a real user would (principally the `myrpki` tool), and leaves the test running indefinitely.

`yamltest` grew out of `smoketest` and the two probably should be merged back into a single tool which supports both kinds of testing.

2.3 Further Reading

If you're interested in this package you might also be interested in:

- `The rcynic validation tool`
- `A live sample of rcynic's summary output`

2.4 Getting Started

The first step to bringing up rpkid and friends is installing the code, which is described in the Installation Guide.

3 Installation Guide

Installation instructions for rpkid et al.

These are the production-side RPKI tools, for Internet Registries (RIRs, LIRs, etc). See the "rcynic" program for relying party tools.

rpkid is a set of Python modules supporting generation and maintenance of resource certificates. Most of the code is in the rpkid/rpki/ directory. rpkid itself is a relatively small program that calls the library modules. There are several other programs that make use of the same libraries, as well as a collection of test programs.

At present the package is intended to be run out of its build directory. Setting up proper installation in a system area using the Python distutils package would likely not be very hard but has not yet been done.

Note that initial development of this code has been on FreeBSD, so installation will probably be easiest on FreeBSD.

Before attempting to build the package, you need to install any missing prerequisites. Note that the Python code requires Python version 2.5 or 2.6. rpkid et al are mostly self-contained, but do require a small number of external packages to run.

- If your Python installation does not already include the sources files needed to compile new Python extension modules, you will need to install whatever package does include those source files. The need for and name of this package varies from system to system. On FreeBSD, the base Python interpreter package includes the development sources; on at least some Linux distributions, you have to install a separate "python-devel" package or something similar. If you get compilation errors trying to build the POW code (below) and the error message says something about the file "Python.h" being missing, this is almost certainly your problem.
- http://codespeak.net/lxml/, a Pythonic interface to the Gnome LibXML2 libraries. lxml in turn requires the LibXML2 C libraries.
  - FreeBSD: /usr/ports/devel/py-lxml
  - Fedora: python-lxml.i386
  - Ubuntu: python-lxml
- http://sourceforge.net/projects/mysql-python/, the Python "db" interface to MySQL. MySQLdb in turn requires MySQL client and server. rpkid et al have been tested with MySQL 5.0 and 5.1.

  - FreeBSD: /usr/ports/databases/py-MySQLdb
  - Fedora: MySQL-python.i386
  - Ubuntu: python-mysqldb

rpkid et al also make heavy use of a modified copy of the Python OpenSSL Wrappers (POW) package, but this copy has enough modifications and additions that it's included in the subversion tree.

The next step is to build the OpenSSL and POW binaries. At present the OpenSSL code is just a snapshot of the OpenSSL development sources, compiled with special options to enable RFC 3779 support that ISC wrote under previous contract to ARIN. The POW (Python OpenSSL Wrapper) library is an extended copy of the stock POW release.

To build these, cd to the top-level directory in the distribution, run the configure script, then run "make":

```
$ cd $top
$ ./configure
$ make
```

This should automatically build everything, in the right order, including linking the POW extension module with the OpenSSL library to provide RFC 3779 support. If you get errors building POW, see the above discussion of Python development sources.

The architecture is intended to support hardware signing modules (HSMs), but the code to support them has not been written.

At this point, you should have all the necessary software installed to run the core programs, but you will probably want to test it. The test suite requires a few more external packages, only one of which is Python code.

- http://pyyaml.org/. Several of the test programs use PyYAML to parse a YAML description of a simulated allocation hierarchy to test.
  - FreeBSD: /usr/ports/devel/py-yaml
  - Ubuntu: python-yaml
- http://xmlsoft.org/XSLT/. Some of the test code uses xsltproc, from the Gnome LibXSLT package.
  - FreeBSD: /usr/ports/textproc/libxslt
  - Ubuntu: xsltproc

All tests should be run from the rpkid/ directories.

Some of the tests require MySQL databases to store their data. To set up all the databases that the tests will need, run the SQL commands in rpkid/tests/smoketest.setup.sql. The MySQL command line client is usually the easiest way to do this, eg:

```
$ cd $top/rpkid
$ mysql -u root -p <tests/smoketest.setup.sql
```

To run the tests, run "make all-tests":

```
$ cd $top/rpkid
$ make all-tests
```

If nothing explodes, your installation is probably ok. Any Python backtraces in the output indicate a problem.

There's a last set of tools that only developers should need, as they're only used when modifying schemas or regenerating the documentation. These tools are listed here for completeness.

- http://www.doxygen.org/. Doxygen in turn pulls in several other tools, notably Graphviz, pdfLaTeX, and Ghostscript.
  - FreeBSD: /usr/ports/devel/doxygen
  - Ubuntu: doxygen
- http://www.mbayer.de/html2text/. The documentation build process uses xsltproc and html2text to dump flat text versions of a few critical documentation pages.
  - FreeBSD: /usr/ports/textproc/html2text
- http://www.thaiopensource.com/relaxng/trang.html. Trang is used to convert RelaxNG schemas from the human-readable "compact" form to the XML form that LibXML2 understands. Trang in turn requires Java.
  - FreeBSD: /usr/ports/textproc/trang
- http://search.cpan.org/dist/SQL-Translator/. SQL-Translator, also known as "SQL Fairy", includes code to parse an SQL schema and dump a description of it as Graphviz input. SQL Fairy in turn requires Perl.
  - FreeBSD: /usr/ports/databases/p5-SQL-Translator

Once you've finished with installation, the next thing you should read is the Configuration Guide.

4 Configuration Guide

This section describes the configuration file syntax and settings.

Each of the programs that make up the RPKI tookit can potentially take its own configuration file, but for most uses this is unnecessarily complicated. The recommended approach is to use a single configuration file, and to put all of the parameters that a normal user might need to change into a single section of that configuration file, then reference these common settings from the program-specific sections of the configuration file via macro expansion. The configuration file parser supports a limited version of the macro facility used in OpenSSL's configuration parser. An expression such as

```
foo = ${bar::baz}
```

sets foo to the value of the `baz` variable from section `bar`. The section name `ENV` is special: it refers to environment variables.

4.1 rpki.conf

The default name for the shared configuration file is `rpki.conf`. Unless you really know what you're doing, you should start by copying the `rpki.conf` from the `rpkid/examples` directory and modifying it, as the sample configuration file already includes all the additional settings necessary to use the simplified configuration.

```
[myrpki]
```

The [myrpki] section of `rpki.conf` contains all the parameters that you really need to configure.

```
# Handle naming hosted resource-holding entity (<self/>) represented
# by this myrpki instance.  Syntax is an identifier (ASCII letters,
# digits, hyphen, underscore -- no whitespace, non-ASCII characters,
# or other punctuation).  You need to set this.

handle                          = Me
```

Every resource-holding or server-operating entity needs a "handle", which is just an identifier by which the entity calls itself. Handles do not need to be globally unique, but should be chosen with an eye towards debugging operational problems: it's best if you use a handle that your parents and children will recognize as being you.

```
# Names of various files and directories.  Don't change these without
# a good reason.

roa_csv                         = roas.csv
prefix_csv                      = prefixes.csv
```

```
asn_csv                         = asns.csv
xml_filename                    = myrpki.xml
bpki_resources_directory        = bpki/resources
bpki_servers_directory          = bpki/servers
```

The myrpki tool requires filenames for several input data files, the "business PKI" databases used to secure CMS and TLS communications, and the XML intermediate format that it uses. Rather than hardwiring the names into the code, they're configured here. You can change the names if you must, but the defaults should be fine in most cases.

```
# Whether you want to run your own copy of rpkid (and irdbd).  You
# want this on unless somebody else is hosting rpkid service for you.

run_rpkid                       = true

# DNS hostname and server port numbers for rpkid and irdbd, if you're
# running them.  rpkid's server host has to be a publicly reachable
# name to be useful; irdbd's server host should always be localhost
# unless you really know what you are doing.  Port numbers can be any
# legal TCP port number that you're not using for something else.

rpkid_server_host               = rpkid.example.org
rpkid_server_port               = 4404
irdbd_server_host               = localhost
irdbd_server_port               = 4403
```

If you're hosting RPKI service for others, or are self-hosting, you want this on. If somebody else is running rpkid on your behalf and you're just shipping them your `myrpki.xml` file, you can turn this off.

If you're running `rpkid` at all, you'll need to set at least the `rpkid_server_host` parameter here. You may be able to use the default port numbers, or may need to pick different ones. Unless you plan to run `irdbd` on a different machine from `rpkid`, you should leave `irdbd_server_host` alone.

```
# Whether you want to run your own copy of pubd.  In general, it's
# best to use your parent's pubd if you can, to reduce the overall
# number of publication sites that relying parties need to check, so
# don't enable this unless you have a good reason.

run_pubd                        = false

# DNS hostname and server port number for pubd, if you're running it.
# Hostname has to be a publicly reachable name to be useful, port can
# be any legal TCP port number that you're not using for something
# else.

pubd_server_host                = pubd.example.org
pubd_server_port                = 4402
```

```
# Contact information to include in offers of repository service.
# This only matters when we're running pubd.  This should be a human
# readable string, perhaps containing an email address or URL.

pubd_contact_info               = repo-man@rpki.example.org
```

The myrpki tool will attempt to negotiate publication service for you with whatever publication service your parent is using, if you let it, so in most cases you should not need to run `pubd` unless you need to issue certificates for private IP address space or private Autononmous System Numbers.

If you do run `pubd`, you will need to set `pubd_server_host`. You may also need to set `pubd_server_port`, and you should provide something helpful as contact information in `pubd_contact_info` if you plan to offer publication service to your RPKI children, so that grandchildren (or descendents even further down the tree) who receive referrals to your service will know how to contact you.

```
# Whether you want to run your very own copy of rootd.  Don't enable
# this unless you really know what you're doing.

run_rootd                       = false

# Server port number for rootd, if you're running it.  This can be any
# legal TCP port number that you're not using for something else.

rootd_server_port               = 4401
```

You shouldn't run rootd unless you're the root of an RPKI tree. Who gets to be the root of the public RPKI tree is a political issue outside the scope of this document. For everybody else, the only reason for running `rootd` (other than test purposes) would be to support certification of private IP addresses and ASNs. The core tools can do this without any problem, but the simplified configuration mechanism does not (yet) make this easy to do.

```
# Root of local directory tree where pubd (and rootd, sigh) should
# write out published data.  You need to configure this, and the
# configuration should match up with the directory where you point
# rsyncd.  Neither pubd nor rsyncd much cares -where- you tell them to
# put this stuff, the important thing is that the rsync:// URIs in
# generated certificates match up with the published objects so that
# relying parties can find and verify rpkid's published outputs.

publication_base_directory      = publication/

# rsyncd module name corresponding to publication_base_directory.
# This has to match the module you configured into rsyncd.conf.
# Leave this alone unless you have some need to change it.

publication_rsync_module        = rpki
```

```
# Hostname and optional port number for rsync:// URIs.  In most cases
# this should just be the same value as pubd_server_host.

publication_rsync_server        = ${myrpki::pubd_server_host}
```

These parameters control the mapping between the rsync URIs presented by `rsyncd` and the local filesystem on the machine where `pubd` and `rsyncd` run. Any changes here must also be reflected as changes in `rsyncd.conf`. In most cases you should not change the value of `publication_rsync_module` from the default; since pubd can't (and should not) rewrite `rsyncd.conf`, it's best to use a static rsync module name here and let `pubd` do its work underneath that name. In most cases `publication_rsync_server` should be the same as `publication_rsync_server`, which is what the macro invocation in the default setting does. `publication_base_directory`, like other pathnames in `rpki.conf`, can be either a relative or absolute pathname; if relative, it's interpreted with respect to the directory in which the programs in question were started. In this specific case, it's probably better to use an absolute pathname, since this pathname must also appear in `rsyncd.conf`.

```
# SQL configuration.  You can ignore this if you're not running any of
# the daemons yourself.

# If you're comfortable with having all of the databases use the same
# MySQL username and password, set those values here.  It's ok to
# leave the default username alone, but you should use a locally
# generated password either here or in the individual settings below.

shared_sql_username             = rpki
shared_sql_password             = fnord

# If you want different usernames and passwords for the separate SQL
# databases, enter those settings here; the shared_sql_* settings are
# only referenced here, so you can remove them entirely if you're
# setting everything in this block.

rpkid_sql_database              = rpkid
rpkid_sql_username              = ${myrpki::shared_sql_username}
rpkid_sql_password              = ${myrpki::shared_sql_password}

irdbd_sql_database              = irdbd
irdbd_sql_username              = ${myrpki::shared_sql_username}
irdbd_sql_password              = ${myrpki::shared_sql_password}

pubd_sql_database               = pubd
pubd_sql_username               = ${myrpki::shared_sql_username}
pubd_sql_password               = ${myrpki::shared_sql_password}
```

These settings control how `rpkid`, `irdbd`, and `pubd` talk to the MySQL server. At minimum, each daemon needs its own database; in the simplest configuration, the username and password can be shared, which is what the macro references in the default

configuration does. If for some reason you need to set different usernames and passwords for different daemons, you can do so by changing the daemon-specific variables.

```
# Name of OpenSSL binary.  You might need to change this if you have
# no system copy installed, or if the system copy doesn't support CMS.
# The copy of openssl built by this package should suffice.

openssl                         = openssl
```

The `myrpki` tool uses the `openssl` command line tool for most of its BPKI operations, for two reasons:

- To avoid duplicating CA-management functionality already provided by the command line tool, and
- To ease portability of the `myrpki` tool, so that a "hosted" resource holder can use it without needing to install entire toolkit.

The `myrpki` tool's use of OpenSSL does not require exotic features like RFC 3779 support, but it does require a version of the tool recent enough to support CMS and the `-ss_cert` argument to the `ca` command. Depending on the platform on which you are running this code, you may or may not have a system copy of the `openssl` tool installed that meets these criteria; if not, the `openssl` binary built when you compile the toolkit will suffice. This parameter allows you to tell `myrpki` where to find the binary, if necessary; the default just uses the system search path.

4.2 Other configuration files and options

In most cases the simplified configuration in the [myrpki] section of `rpki.conf` should suffice, but in case you need to tinker, here are details on the the rest of the configuration options. In most cases the default name of the configuration file for a program is the name of the program followed by `".conf"`, and the section name is also named for the program, so that you can combine sections into a single configuration file as shown with `rpki.conf`.

- Common configuration options
- rpkid configuration
- irdbd configuration
- pubd configuration

- rootd configuration
- configuration of the smoketest test harness
- test description language for the smoketest test harness

Once you've finished with configuration, the next thing you should read is the MySQL setup instructions.

4.3 Common Configuration Options

Some of the options that the several daemons take are common to all daemons.

Which daemon they affect depends only on which sections of which config files they are in.

The first group of options are debugging flags, which can be set to "true" or "false". If not specified, default values will be chosen (generally false).

`debug_http`:

Enable verbose http debug logging.

`debug_tls_certs`:

Enable verbose logging about tls certs.

`want_persistent_client`:

Enable http 1.1 persistence, client side.

`want_persistent_server`:

Enable http 1.1 persistence, server side.

`debug_cms_certs`:

Enable verbose logging about cms certs.

`sql_debug`:

Enable verbose logging about sql operations.

`gc_debug`:

Enable scary garbage collector debugging.

timer_debug:

Enable verbose logging of timer system.

There are also a few options that allow you to save CMS messages for audit or debugging. The save format is a simple MIME encoding in a Maildir-format mailbox. The current options are very crude, at some point we may provide finer grain controls.

dump_outbound_cms:

Dump messages we send to this mailbox.

dump_inbound_cms:

Dump messages we receive to this mailbox.

4.4 rpkid.conf

rpkid's default config file is rpkid.conf, start rpkid with "-c filename" to choose a different config file.

All options are in the section "[rpkid]". Certificates, keys, and trust anchors may be in either DER or PEM format.

Config file options:

startup-message:

String to log on startup, useful when debugging a collection of rpkid instances at once.

sql-username:

Username to hand to MySQL when connecting to rpkid's database.

sql-database:

MySQL's database name for rpkid's database.

sql-password:

Password to hand to MySQL when connecting to rpkid's database.

bpki-ta:

Name of file containing BPKI trust anchor. All BPKI certificate verification within rpkid traces back to this trust anchor.

rpkid-cert:

Name of file containing rpkid's own BPKI EE certificate.

rpkid-key:

Name of file containing RSA key corresponding to rpkid-cert.

irbe-cert:

Name of file containing BPKI certificate used by IRBE when talking to rpkid.

irdb-cert:

Name of file containing BPKI certificate used by irdbd.

irdb-url:

Service URL for irdbd. Must be a http:// URL.

server-host:

Hostname or IP address on which to listen for HTTP connections. Current default is INADDR_ANY (IPv4 0.0.0.0); this will need to be hacked to support IPv6 for production.

server-port:

TCP port on which to listen for HTTP connections.

4.5 irdbd.conf

irdbd's default config file is irdbd.conf, start irdbd with "-c filename" to choose a different config file.

All options are in the section "[irdbd]". Certificates, keys, and trust anchors may be in either DER or PEM format.

Config file options:

startup-message:

String to log on startup, useful when debugging a collection of irdbd instances at once.

sql-username:

Username to hand to MySQL when connecting to irdbd's database.

sql-database:

MySQL's database name for irdbd's database.

sql-password:

Password to hand to MySQL when connecting to irdbd's database.

bpki-ta:

Name of file containing BPKI trust anchor. All BPKI certificate validation in irdbd traces back to this trust anchor.

irdbd-cert:

Name of file containing irdbd's own BPKI certificate.

irdbd-key:

Name of file containing RSA key corresponding to irdbd-cert.

rpkid-cert:

Name of file containing certificate used the one and only by rpkid instance authorized to contact this irdbd instance.

http-url:

Service URL for irdbd. Must be a http:// URL.

4.6 pubd.conf

pubd's default config file is pubd.conf, start pubd with "-c filename" to choose a different config file.

All options are in the section "[pubd]". Certifiates, keys, and trust anchors may be either DER or PEM format.

Config file options:

sql-username:

Username to hand to MySQL when connecting to pubd's database.

sql-database:

MySQL's database name for pubd's database.

sql-password:

Password to hand to MySQL when connecting to pubd's database.

bpki-ta:

Name of file containing master BPKI trust anchor for pubd. All BPKI validation in pubd traces back to this trust anchor.

irbe-cert:

Name of file containing BPKI certificate used by IRBE when talking to pubd.

pubd-cert:

Name of file containing BPKI certificate used by pubd.

pubd-key:

Name of file containing RSA key corresponding to `pubd-cert`.

server-host:

Hostname or IP address on which to listen for HTTP connections. Current default is INADDR_ANY (IPv4 0.0.0.0); this will need to be hacked to support IPv6 for production.

server-port:

TCP port on which to listen for HTTP connections.

publication-base:

Path to base of filesystem tree where pubd should store publishable objects. Default is "publication/".

4.7 rootd.conf

rootd's default config file is rootd.conf, start rootd with "-c filename" to choose a different config file.

All options are in the section "[rootd]". Certificates, keys, and trust anchors may be in either DER or PEM format.

Config file options:

bpki-ta:

Name of file containing BPKI trust anchor. All BPKI certificate validation in rootd traces back to this trust anchor.

rootd-bpki-cert:

Name of file containing rootd's own BPKI certificate.

rootd-bpki-key:

Name of file containing RSA key corresponding to rootd-bpki-cert.

rootd-bpki-crl:

Name of file containing BPKI CRL that would cover rootd-bpki-cert had it been revoked.

child-bpki-cert:

Name of file containing BPKI certificate for rootd's one and only child (RPKI engine to which rootd issues an RPKI certificate).

server-host:

Hostname or IP address on which to listen for HTTP connections. Default is localhost.

server-port:

TCP port on which to listen for HTTP connections.

rpki-root-key:

Name of file containing RSA key to use in signing resource certificates.

rpki-root-cert:

Name of file containing self-signed root resource certificate corresponding to rpki-root-key.

rpki-root-dir:

Name of directory where rootd should write RPKI subject certificate, manifest, and CRL.

rpki-subject-cert:

Name of file that rootd should use to save the one and only certificate it issues. Default is "Subroot.cer".

rpki-root-crl:

Name of file to which rootd should save its RPKI CRL. Default is "Root.crl".

rpki-root-manifest:

Name of file to which rootd should save its RPKI manifest. Default is "Root.mnf".

rpki-subject-pkcs10:

Name of file that rootd should use when saving a copy of the received PKCS #10 request for a resource certificate. This is only used for debugging. Default is not to save the PKCS #10 request.

4.8 smoketest.conf

All of the options in smoketest's (optional) configuration file are overrides for wired-in default values.

In almost all cases the defaults will suffice. There are a ridiculous number of options, most of which noone will ever need, see the code for details. The default name for this configuration file is smoketest.conf, run smoketest with "-c filename" to change it.

4.9 smoketest.yaml

smoketest's second configuration file is named smoketest.yaml by default, run smoketest with "-y filename" to change it.

The YAML file contains multiple YAML "documents". The first document describes the initial test layout and resource allocations, subsequent documents describe modifications to the initial allocations and other parameters. Resources listed in the initial layout are aggregated automatically, so that a node in the resource hierarchy automatically receives the resources it needs to issue whatever its children are listed as holding. Actions in the subsequent documents are modifications to the current resource set, modifications to validity dates or other non-resource parameters, or special commands like "sleep".

Here's an example of current usage:

```
name:           Alice
valid_for:      2d
sia_base:       "rsync://alice.example/rpki/"
kids:
  - name: Bob
 kids:
   - name: Carol
     ipv4: 192.0.2.1-192.0.2.33
     asn:  64533
---
- name: Carol
  valid_add:   10
---
- name: Carol
  add_as: 33
  valid_add:   2d
---
- name: Carol
  valid_sub:   2d
---
- name: Carol
  valid_for:   10d
```

This specifies an initial layout consisting of an RPKI engine named "Alice", with one child "Bob", which in turn has one child "Carol". Carol has a set of assigned resources,

and all resources in the system are initially set to be valid for two days from the time at which the test is started. The first subsequent document adds ten seconds to the validity interval for Carol's resources and makes no other modifications. The second subsequent document grants Carol additional resources and adds another two days to the validity interval for Carol's resources. The next document subtracts two days from the validity interval for Carol's resources. The final document sets the validity interval for Carol's resources to ten days.

Operators in subsequent (update) documents:

`add_as:`

Add ASN resources.

`add_v4:`

Add IPv4 resources.

`add_v6:`

Add IPv6 resources.

`sub_as:`

Subtract ASN resources.

`sub_v4:`

Subtract IPv4 resources.

`sub_v6:`

Subtract IPv6 resources.

`valid_until:`

Set an absolute expiration date.

`valid_for:`

Set a relative expiration date.

`valid_add:`

Add to validity interval.

`valid_sub:`

Subtract from validity interval.

`sleep` [interval]:

Sleep for specified interval, or until smoketest receives a SIGALRM signal.

`shell` cmd...:

Pass rest of line verbatim to /bin/sh and block until the shell returns.

Absolute timestamps should be in the form shown (UTC timestamp format as used in XML).

Intervals (`valid_add`, `valid_sub`, `valid_for`, `sleep`) are either integers, in which case they're interpreted as seconds, or are a string of the form "wD xH yM zS" where w, x, y, and z are integers and D, H, M, and S indicate days, hours, minutes, and seconds. In the latter case all of the fields are optional, but at least one must be specified. For example, "3D4H" means "three days plus four hours".

5 MySQL Setup

You need to install MySQL and set up the relevant databases before starting `rpkid`, `irdbd`, or `pubd`.

See the Installation Guide for details on where to download MySQL and find documentation on installing it.

See the Configuration Guide for details on the configuration file settings the daemons will use to find and authenticate themselves to their respective databases.

Before you can (usefully) start any of the daemons, you will need to set up the MySQL databases they use. You can do this by hand, or you can use the `rpki-sql-setup` script, which prompts you for your MySQL root password then attempts to do everything else automatically using values from rpki.conf.

Using the script is simple:

```
$ rpki-sql-setup.py
Please enter your MySQL root password:
```

The script should tell you what databases it creates. You can use the -v option if you want to see more details about what it's doing.

If you'd prefer to do the SQL setup manually, perhaps because you have valuable data in other MySQL databases and you don't want to trust some random setup script with your MySQL root password, you'll need to use the MySQL command line tool, as follows:

```
$ mysql -u root -p
```

```
mysql> CREATE DATABASE irdb_database;
mysql> GRANT all ON irdb_database.* TO irdb_user@localhost IDENTIFIED BY 'irdb_password';
mysql> USE irdb_database;
mysql> SOURCE $top/rpkid/irdbd.sql;
mysql> CREATE DATABASE rpki_database;
mysql> GRANT all ON rpki_database.* TO rpki_user@localhost IDENTIFIED BY 'rpki_password';
mysql> USE rpki_database;
mysql> SOURCE $top/rpkid/rpkid.sql;
mysql> COMMIT;
mysql> quit
```

where `irdb_database`, `irdb_user`, `irdb_password`, `rpki_database`, `rpki_user`, and `rpki_password` match the values you used in your configuration file.

If you are running pubd and are doing manual SQL setup, you'll also have to do:

```
$ mysql -u root -p
mysql> CREATE DATABASE pubd_database;
mysql> GRANT all ON pubd_database.* TO pubd_user@localhost IDENTIFIED BY 'pubd_password';
mysql> USE pubd_database;
mysql> SOURCE $top/rpkid/pubd.sql;
mysql> COMMIT;
mysql> quit
```

where `pubd_database`, `pubd_user` `pubd_password` match the values you used in your configuration file.

Once you've finished configuring MySQL, the next thing you should read is the instructions for the myrpki tool.

6 The myrpki tool

The design of rpkid and friends assumes that certain tasks can be thrown over the wall to the registry's back end operation.

This was a deliberate design decision to allow rpkid et al to remain independent of existing database schema, business PKIs, and so forth that a registry might already have. All very nice, but it leaves someone who just wants to test the tools or who has no existing back end with a fairly large programming project. The `myrpki` tool attempts to fill that gap.

`myrpki` is a basic implementation of what a registry back end would need to use rpkid and friends. `myrpki` does not use every available option in the other programs, nor is it necessarily as efficient as possible. Large registries will almost certainly want to roll their own tools, perhaps using these as a starting point. Nevertheless, we hope that `myrpki` will at least provide a useful example, and may be adaquate for simple use.

myrpki is (currently) implemented as a single command line Python program. It has a number of commands, most of which are used for initial setup, some of which are used on an ongoing basis. myrpki can be run either in an interactive mode or by passing a single command on the command line when starting the program; the former mode is intended to be somewhat human-friendly, the latter mode is useful in scripting, cron jobs, and automated testing.

myrpki use has two distinct phases: setup and data maintenance. The setup phase is primarily about constructing the "business PKI" (BPKI) certificates that the daemons use to authenticate CMS messages and obtaining the service URLs needed to configure the daemons. The data maintenance phase is about configuring local data into the daemons.

myrpki uses the OpenSSL command line tool for almost all operations on keys and certificates; the one exception to this is the comamnd which talks directly to the daemons, as this command uses the same communication libraries as the daemons themselves do. The intent behind using the OpenSSL command line tool for everything else is to allow all the other commands to be run without requiring all the auxiliary packages upon which the daemons depend; this can be useful, eg, if one wants to run the back-end on a laptop while running the daemons on a server, in which case one might prefer not to have to install a bunch of unnecessary packages on the laptop.

During setup phase myrpki generates and processes small XML messages which it expects the user to ship to and from its parents, children, etc via some out-of-band means (email, perhaps with PGP signatures, USB stick, we really don't care). During data maintenance phase, myrpki does something similar with another XML file, to allow hosting of RPKI services; in the degenerate case where an entity is just self-hosting (ie, is running the daemons for itself, and only for itself), this latter XML file need not be sent anywhere.

The basic idea here is that a user who has resources maintains a set of .csv files containing a text representation of the data needed by the back-end, along with a configuration file containing other parameters. The intent is that these be very simple files that are easy to generate either by hand or as a dump from relational database, spreadsheet, awk script, whatever works in your environment. Given these files, the user then runs myrpki to extract the relevant information and encode everything about its back end state into an XML file, which can then be shipped to the appropriate other party.

Many of the myrpki commands which process XML input write out a new XML file, either in place or as an entirely new file; in general, these files need to be sent back to the party that sent the original file. Think of all this as a very slow packet-based communication channel, where each XML file is a single packet. In setup phase, there's generally a single round-trip per setup conversation; in the data maintenance phase, the same XML file keeps bouncing back and forth between hosted entity and hosting entity.

Note that, as certificates and CRLs have expiration and nextUpdate values, a low-level cycle of updates passing between resource holder and rpkid operator will be necessary as a part of steady state operation. [The current version of these tools does not yet

regenerate these expiring objects, but fixing this will be a relatively minor matter.]

The third important kind of file in this system is the configuration file for `myrpki`. This contains a number of sections, some of which are for myrpki, others of which are for the OpenSSL command line tool, still others of which are for the various RPKI daemon programs. The examples/ subdirectory contains a commented version of the configuration file that explains the various parameters.

The .csv files read by myrpki are (now) misnamed: formerly, they used the "excel-tab" format from the Python csv library, but early users kept trying to make the colums line up, which didn't do what the users expected. So now these files are just whitespace-delimted, such as a program like "awk" would understand.

Keep reading, and don't panic.

The default configuration file name for `myrpki` is `rpki.conf`. You can change this using the "-c" option when invoking myrpki, or by setting the environment variable MYRPKI_CONF.

See examples/∗.csv for commented examples of the several CSV files. Note that the comments themselves are not legal CSV, they're just present to make it easier to understand the examples.

6.1 myrpki overview

Which process you need to follow depends on whether you are running rpkid yourself or will be hosted by somebody else. We call the first case "self-hosted", because the software treats running rpkid to handle resources that you yourself hold as if you are an rpkid operator who is hosting an entity that happens to be yourself.

"$top" in the following refers to wherever you put the subvert-rpki.hactrn.net code. Once we have autoconf and "make install" targets, this will be some system directory or another; for now, it's wherever you checked out a copy of the code from the subversion repository or unpacked a tarball of the code.

Most of the setup process looks the same for any resource holder, regardless of whether they are self-hosting or not. The differences come in the data maintenence phase.

The steps needed during setup phase are:

- Write a configuration file (copy $top/rpkid/examples/rpki.conf and edit as needed). You need to configure the [myrpki] section; in theory, the rest of the file should be ok as it is, at least for simple use. You also need to create (either by hand or by dumping from a database, spreadsheet, whatever) the CSV files describing prefixes and ASNs you want to allocate to your children and ROAs you want created.

- Initialization ("initialize" command). This creates the local BPKI and other data structures that can be constructed just based on local data such as the config

file. Other than some internal data structures, the main output of this step is the "identity.xml" file, which is used as input to later stages.

In theory it should be safe to run the "initialize" command more than once, in practice this has not (yet) been tested.

- Send (email, USB stick, carrier pigeon) identity.xml to each of your parents. This tells each of your parents what you call yourself, and supplies each parent with a trust anchor for your resource-holding BPKI.

- Each of your parents runs the "configure_child" command, giving the identity.xml you supplied as input. This registers your data with the parent, including BPKI cross-registration, and generates a return message containing your parent's BPKI trust anchors, a service URL for contacting your parent via the "up-down" protocol, and (usually) either an offer of publication service (if your parent operates a repository) or a referral from your parent to whatever publication service your parent does use. Referrals include a CMS-signed authorization token that the repository operator can use to determine that your parent has given you permission to home underneath your parent in the publication tree.

- Each of your parents sends (...) back the response XML file generated by the "configure_child" command.

- You feed the response message you just got into myrpki using the "configure_parent" command. This registers the parent's information in your database, including BPKI cross-certification, and processes the repository offer or referral to generate a publication request message.

- You send (...) the publication request message to the repository. The `contact_info` element in the request message should (in theory) provide some clue as to where you should send this.

- The repository operator processes your request using myrpki's "configure_publication_client" command. This registers your information, including BPKI cross-certification, and generates a response message containing the repository's BPKI trust anchor and service URL.

- Repository operator sends (...) the publication confirmation message back to you.

- You process the publication confirmation message using myrpki's "configure_repository" command.

At this point you should, in theory, have established relationships, exchanged trust anchors, and obtained service URLs from all of your parents and repositories. The last setup step is establishing a relationship with your RPKI service host, if you're not self-hosted, but as this is really just the first message of an ongoing exchange with your host, it's handled by the data maintenance commands.

The two commands used in data maintenence phase are "configure_resources" and "configure_daemons". The first is used by the resource holder, the second is used by the host. In the self-hosted case, it is not necessary to run "configure_resources" at all, myrpki will run it for you automatically.

6.2 Hosted case

The basic steps involved in getting started for a resource holder who is being hosted by somebody else are:

- Run through steps listed in the myrpki overview section.
- Run the configure_resources command to generate myrpki.xml.
- Send myrpki.xml to the rpkid operator who will be hosting you.
- Wait for your rpkid operator to ship you back an updated XML file containing a PKCS #10 certificate request for the BPKI signing context (BSC) created by rpkid.
- Run configure_resources again with the XML file you just received, to issue the BSC certificate and update the XML file again to contain the newly issued BSC certificate.
- Send the updated XML file back to your rpkid operator.

At this point you're done with initial setup. You will need to run configure_resources again whenever you make any changes to your configuration file or CSV files.

Warning

Once myrpki knows how to update BPKI CRLs, you will also need to run configure_-resources periodically to keep your BPKI CRLs up to date.

Any time you run configure_resources myrpki, you should send the updated XML file to your rpkid operator, who should send you a further updated XML file in response.

6.3 Self-hosted case

The first few steps involved in getting started for a self-hosted resource holder (that is, a resource holder that runs its own copy of rpkid) are the same as in the hosted case above; after that the process diverges.

The [current] steps are:

- Follow the basic installation instructions in the Installation Guide to build the RFC-3779-aware OpenSSL code and associated Python extension module.
- Run through steps listed in the myrpki overview section.
- Set up the MySQL databases that rpkid et al will use. The package includes a tool to do this for you, you can use that or do the job by hand. See MySQL database setup for details.
- If you are running your own publication repository (that is, if you are running pubd), you will also need to set up an rsyncd server or configure your existing one to serve pubd's output. There's a sample configuration file in $top/rpkid/examples/rsyncd.conf, but you may need to do something more complicated if you are already running rsyncd for other purposes. See the rsync(1) and rsyncd.conf(5) manual pages for more details.
- Start the daemons. You can use $top/rpkid/rpki-start-servers.py to do this, or write your own script. If you intend to run pubd, you should make sure that the directory you specified as publication_base_directory exists and is writable by the userid that will be running pubd, and should also make sure to start rsyncd.
- Run myrpki's configure_daemons command, twice, with no arguments. You need to run the command twice because myrpki has to ask rpkid to create a key-pair and generate a certification request for the BSC. The first pass does this, the second processes the certification request, issues the BSC, and loads the result into rpkid. [Yes, we could automate this somehow, if necessary.]

At this point, if everything went well, rpkid should be up, configured, and starting to obtain resource certificates from its parents, generate CRLs and manifests, and so forth. At this point you should go figure out how to use the relying party tool, rcynic: see $top/rcynic/README if you haven't already done so.

If and when you change your CSV files, you should run configure_daemons again to feed the changes into the daemons.

6.4 Hosting case

If you are running rpkid not just for your own resources but also to host other resource holders (see hosted case above), your setup will be almost the same as in the self-hosted case (see self-hosted case, above), with one procedural change: you will need to tell `configure_daemons` to process the XML files produced by the resource holders you are hosting. You do this by specifying the names of all those XML files on as arguments to the `configure_daemons` command. So, if you are hosting two friends, Alice and Bob, then, everywhere the instructions for the self-hosted case say to run `configure_daemons` with no arguments, you will instead run it with the names of Alice's and Bob's XML files as arguments.

Note that `configure_daemons` sometimes modifies these XML files, in which case it will write them back to the same filenames. While it is possible to figure out the set of circumstances in which this will happen (at present, only when `myrpki` has to ask `rpkid` to create a new BSC keypair and PKCS #10 certificate request), it may be easiest just to ship back an updated copy of the XML file after every you run `configure_daemons`.

6.5 "Pure" hosting case

In general we assume that anybody who bothers to run `rpkid` is also a resource holder, but the software does not insist on this.

Todo

> Er, well, rpkid doesn't, but myrpki now does -- "pure" hosting was an unused feature that fell by the wayside while simplifying the user interface. It would be relatively straightforward to add it back if we ever need it for anything, but the mechanism it used to use no longer exists -- the old [myirbe] section of the config file has been collapsed into the [myrpki] section, so testing for existance of the [myrpki] section no longer works. So we'll need an explicit configuration option, no big deal, just not worth chasing now.

A (perhaps) plausible use for this capability would be if you are an rpkid-running resource holder who wants for some reason to keep the resource-holding side of your operation completely separate from the rpkid-running side of your operation. This is essentially the pure-hosting model, just with an internal hosted entity within a different part of your own organization.

6.6 Troubleshooting

If you run into trouble setting up this package, the first thing to do is categorize the kind of trouble you are having. If you've gotten far enough to be running the daemons, check their log files. If you're seeing Python exceptions, read the error messages. If

you're getting TLS errors, check to make sure that you're using all the right BPKI certificates and service contact URLs.

TLS configuration errors are, unfortunately, notoriously difficult to debug, because connection failures due to misconfiguration happen early, deep in the guts of the OpenSSL TLS code, where there isn't enough application context available to provide useful error messages.

If you've completed the steps above, everything appears to have gone OK, but nothing seems to be happening, the first thing to do is check the logs to confirm that nothing is actively broken. `rpkid's` log should include messages telling you when it starts and finishes its internal "cron" cycle. It can take several cron cycles for resources to work their way down from your parent into a full set of certificates and ROAs, so have a little patience. `rpkid's` log should also include messages showing every time it contacts its parent(s) or attempts to publish anything.

`rcynic` in fully verbose mode provides a fairly detailed explanation of what it's doing and why objects that fail have failed.

You can use `rsync` (sic) to examine the contents of a publication repository one directory at a time, without attempting validation, by running rsync with just the URI of the directory on its command line:

```
$ rsync rsync://rpki.example.org/where/ever/
```

6.7 Known Issues

The lxml package provides a Python interface to the Gnome libxml2 and libxslt C libraries. This code has been quite stable for several years, but initial testing with lxml compiled and linked against a newer version of libxml2 ran into problems (specifically, gratuitous RelaxNG schema validation failures). libxml2 2.7.3 worked; libxml2 2.7.5 did not work on the test machine in question. Reverting to libxml2 2.7.3 fixed the problem. Rewriting the two lines of Python code that were triggering the lxml bug appears to have solved the problem, so the code now works properly with libxml 2.7.5, but if you start seeing weird XML validation failures, it might be another variation of this lxml bug.

An earlier version of this code ran into problems with what appears to be an implementation restriction in the the GNU linker ("ld") on 64-bit hardware, resulting in obscure build failures. The workaround for this required use of shared libraries and is somewhat less portable than the original code, but without it the code simply would not build in 64-bit environments with the GNU tools. The current workaround appears to behave properly, but the workaround requires that the pathname to the RFC-3779-aware OpenSSL shared libraries be built into the _POW.so Python extension module. If necessary, you can override this by setting the LD_LIBRARY_PATH environment variable, see the ld.so man page for details. This is a relatively minor variation on the usual build issues for shared libraries, it's just annoying because shared libraries should

not be needed here and would not be if not for this GNU linker issue.

7 Left-Right Protocol

The left-right protocol is really two separate client/server protocols over separate channels between the RPKI engine and the IR back end (IRBE).

The IRBE is the client for one of the subprotocols, the RPKI engine is the client for the other.

7.1 initiated by the IRBE

This part of the protcol uses a kind of message-passing. Each object that the RPKI engine knows about takes five messages: "create", "set", "get", "list", and "destroy". Actions which are not just data operations on objects are handled via an SNMP-like mechanism, as if they were fields to be set. For example, to generate a keypair one "sets" the "generate-keypair" field of a BSC object, even though there is no such field in the object itself as stored in SQL. This is a bit of a kludge, but the reason for doing it as if these were variables being set is to allow composite operations such as creating a BSC, populating all of its data fields, and generating a keypair, all as a single operation. With this model, that's trivial, otherwise it's at least two round trips.

Fields can be set in either "create" or "set" operations, the difference just being whether the object already exists. A "get" operation returns all visible fields of the object. A "list" operation returns a list containing what "get" would have returned on each of those objects.

Left-right protocol objects are encoded as signed CMS messages containing XML as eContent and using an eContentType OID of `id-ct-xml` (1.2.840.113549.1.9.16.1.28). These CMS messages are in turn passed as the data for HTTP POST operations, with an HTTP content type of "application/x-rpki" for both the POST data and the response data.

All operations allow an optional "tag" attribute which can be any alphanumeric token. The main purpose of the tag attribute is to allow batching of multiple requests into a single PDU.

7.1.1 <self/> object

A `<self/>` object represents one virtual RPKI engine. In simple cases where the RPKI engine operator operates the engine only on their own behalf, there will only be one `<self/>` object, representing the engine operator's organization, but in environments where the engine operator hosts other entities, there will be one `<self/> object` per hosted entity (probably including the engine operator's own organization, considered as a hosted customer of itself).

Some of the RPKI engine's configured parameters and data are shared by all hosted entities, but most are tied to a specific `<self/>` object. Data which are shared by all hosted entities are referred to as "per-engine" data, data which are specific to a particular `<self/>` object are "per-self" data.

Since all other RPKI engine objects refer to a `<self/>` object via a "self_handle" value, one must create a `<self/>` object before one can usefully configure any other left-right protocol objects.

Every `<self/>` object has a self_handle attribute, which must be specified for the "create", "set", "get", and "destroy" actions.

Payload data which can be configured in a `<self/>` object:

`use_hsm` (attribute):

Whether to use a Hardware Signing Module. At present this option has no effect, as the implementation does not yet support HSMs.

`crl_interval` (attribute):

Positive integer representing the planned lifetime of an RPKI CRL for this `<self/>`, measured in seconds.

`regen_margin` (attribute):

Positive integer representing how long before expiration of an RPKI certificiate a new one should be generated, measured in seconds. At present this only affects the one-off EE certificates associated with ROAs. This parameter also controls how long before the nextUpdate time of CRL or manifest the CRL or manifest should be updated.

`bpki_cert` (element):

BPKI CA certificate for this `<self/>`. This is used as part of the certificate chain when validating incoming TLS and CMS messages, and should be the issuer of cross-certification BPKI certificates used in `<repository/>`, `<parent/>`, and `<child/>` objects. If the bpki_glue certificate is in use (below), the bpki_-cert certificate should be issued by the bpki_glue certificate; otherwise, the bpki_-cert certificate should be issued by the per-engine bpki_ta certificate.

`bpki_glue` (element):

Another BPKI CA certificate for this `<self/>`, usually not needed. Certain pathological cross-certification cases require a two-certificate chain due to issuer name conflicts. If used, the bpki_glue certificate should be the issuer of the bpki_-cert certificate and should be issued by the per-engine bpki_ta certificate; if not needed, the bpki_glue certificate should be left unset.

Control attributes that can be set to "yes" to force actions:

rekey:

Start a key rollover for every RPKI CA associated with every <parent/> object associated with this <self/> object. This is the first phase of a key rollover operation.

revoke:

Revoke any remaining certificates for any expired key associated with any RPKI CA for any <parent/> object associated with this <self/> object. This is the second (cleanup) phase for a key rollover operation; it's separate from the first phase to leave time for new RPKI certificates to propegate and be installed.

reissue:

Not implemented, may be removed from protocol. Original theory was that this operation would force reissuance of any object with a changed key, but as that happens automatically as part of the key rollover mechanism this operation seems unnecessary.

run_now:

Force immediate processing for all tasks associated with this <self/> object that would ordinarily be performed under cron. Not currently implemented.

publish_world_now:

Force (re)publication of every publishable object for this <self/> object. Not currently implemented. Intended to aid in recovery if RPKI engine and publication engine somehow get out of sync.

7.1.2 <bsc/> object

The <bsc/> ("business signing context") object represents all the BPKI data needed to sign outgoing CMS messages. Various other objects include pointers to a <bsc/> object. Whether a particular <self/> uses only one <bsc/> or multiple is a configuration decision based on external requirements: the RPKI engine code doesn't care, it just cares that, for any object representing a relationship for which it must sign messages, there be a <bsc/> object that it can use to produce that signature.

Every <bsc/> object has a bsc_handle, which must be specified for the "create", "get", "set", and "destroy" actions. Every <bsc/> also has a self_handle attribute which indicates the <self/> object with which this <bsc/> object is associated.

Payload data which can be configured in a <isc/> object:

signing_cert (element):

BPKI certificate to use when generating a signature.

`signing_cert_crl` (element):

CRL which would list signing_cert if it had been revoked.

Control attributes that can be set to "yes" to force actions:

`generate_keypair`:

Generate a new BPKI keypair and return a PKCS #10 certificate request. The resulting certificate, once issued, should be configured as this `<bsc/>` object's signing_cert.

Additional attributes which may be specified when specifying "generate_keypair":

`key_type`:

Type of BPKI keypair to generate. "rsa" is both the default and, at the moment, the only allowed value.

`hash_alg`:

Cryptographic hash algorithm to use with this keypair. "sha256" is both the default and, at the moment, the only allowed value.

`key_length`:

Length in bits of the keypair to be generated. "2048" is both the default and, at the moment, the only allowed value.

Replies to "create" and "set" actions that specify "generate-keypair" include a <bsc_-pkcs10/> element, as do replies to "get" and "list" actions for a `<bsc/>` object for which a "generate-keypair" command has been issued. The RPKI engine stores the PKCS #10 request, which allows the IRBE to reuse the request if and when it needs to reissue the corresponding BPKI signing certificate.

7.1.3 <parent/> object

The `<parent/>` object represents the RPKI engine's view of a particular parent of the current `<self/>` object in the up-down protocol. Due to the way that the resource hierarchy works, a given `<self/>` may obtain resources from multiple parents, but it will always have at least one; in the case of IANA or an RIR, the parent RPKI engine may be a trivial stub.

Every `<parent/>` object has a parent_handle, which must be specified for the "create", "get", "set", and "destroy" actions. Every `<parent/>` also has a self_handle attribute which indicates the `<self/>` object with which this `<parent/>` object is associated, a bsc_handle attribute indicating the `<bsc/>` object to be used

when signing messages sent to this parent, and a repository_handle indicating the <repository/> object to be used when publishing issued by the certificate issued by this parent.

Payload data which can be configured in a <parent/> object:

peer_contact_uri (attribute):

HTTP URI used to contact this parent.

sia_base (attribute):

The leading portion of an rsync URI that the RPKI engine should use when composing the publication URI for objects issued by the RPKI certificate issued by this parent.

sender_name (attribute):

Sender name to use in the up-down protocol when talking to this parent. The RPKI engine doesn't really care what this value is, but other implementations of the up-down protocol do care.

recipient_name (attribute):

Recipient name to use in the up-down protocol when talking to this parent. The RPKI engine doesn't really care what this value is, but other implementations of the up-down protocol do care.

bpki_cms_cert (element):

BPKI CMS CA certificate for this <parent/>. This is used as part of the certificate chain when validating incoming CMS messages If the bpki_cms_glue certificate is in use (below), the bpki_cms_cert certificate should be issued by the bpki_cms_glue certificate; otherwise, the bpki_cms_cert certificate should be issued by the bpki_cert certificate in the <self/> object.

bpki_cms_glue (element):

Another BPKI CMS CA certificate for this <parent/>, usually not needed. Certain pathological cross-certification cases require a two-certificate chain due to issuer name conflicts. If used, the bpki_cms_glue certificate should be the issuer of the bpki_cms_cert certificate and should be issued by the bpki_cert certificate in the <self/> object; if not needed, the bpki_cms_glue certificate should be left unset.

Control attributes that can be set to "yes" to force actions:

rekey:

This is like the rekey command in the <self/> object, but limited to RPKI CAs under this parent.

reissue:

This is like the reissue command in the <self/> object, but limited to RPKI CAs under this parent.

revoke:

This is like the revoke command in the <self/> object, but limited to RPKI CAs under this parent.

7.1.4 <child/> object

The <child/> object represents the RPKI engine's view of particular child of the current <self/> in the up-down protocol.

Every <child/> object has a child_handle, which must be specified for the "create", "get", "set", and "destroy" actions. Every <child/> also has a self_handle attribute which indicates the <self/> object with which this <child/> object is associated.

Payload data which can be configured in a <child/> object:

bpki_cert (element):

BPKI CA certificate for this <child/>. This is used as part of the certificate chain when validating incoming TLS and CMS messages. If the bpki_glue certificate is in use (below), the bpki_cert certificate should be issued by the bpki_glue certificate; otherwise, the bpki_cert certificate should be issued by the bpki_cert certificate in the <self/> object.

bpki_glue (element):

Another BPKI CA certificate for this <child/>, usually not needed. Certain pathological cross-certification cases require a two-certificate chain due to issuer name conflicts. If used, the bpki_glue certificate should be the issuer of the bpki_cert certificate and should be issued by the bpki_cert certificate in the <self/> object; if not needed, the bpki_glue certificate should be left unset.

Control attributes that can be set to "yes" to force actions:

reissue:

Not implemented, may be removed from protocol.

7.1.5 <repository/> object

The <repository/> object represents the RPKI engine's view of a particular publication repository used by the current <self/> object.

Every <repository/> object has a repository_handle, which must be specified for the "create", "get", "set", and "destroy" actions. Every <repository/> also has a self_handle attribute which indicates the <self/> object with which this <repository/> object is associated.

Payload data which can be configured in a <repository/> object:

peer_contact_uri (attribute):

HTTP URI used to contact this repository.

bpki_cms_cert (element):

BPKI CMS CA certificate for this <repository/>. This is used as part of the certificate chain when validating incoming CMS messages If the bpki_cms_-glue certificate is in use (below), the bpki_cms_cert certificate should be issued by the bpki_cms_glue certificate; otherwise, the bpki_cms_cert certificate should be issued by the bpki_cert certificate in the <self/> object.

bpki_cms_glue (element):

Another BPKI CMS CA certificate for this <repository/>, usually not needed. Certain pathological cross-certification cases require a two-certificate chain due to issuer name conflicts. If used, the bpki_cms_glue certificate should be the issuer of the bpki_cms_cert certificate and should be issued by the bpki_cert certificate in the <self/> object; if not needed, the bpki_cms_glue certificate should be left unset.

At present there are no control attributes for <repository/> objects.

7.1.6 <route_origin/> object

This section is out-of-date. The <route_origin/> object has been replaced by the <list_roa_requests/> IRDB query, but the documentation for that hasn't been written yet.

The <route_origin/> object is a kind of prototype for a ROA. It contains all the information needed to generate a ROA once the RPKI engine obtains the appropriate RPKI certificates from its parent(s).

Note that a <route_origin/> object represents a ROA to be generated on behalf of <self/>, not on behalf of a <child/>. Thus, a hosted entity that has no children but which does need to generate ROAs would be represented by a hosted

<self/> with no <child/> objects but one or more <route_origin/> objects. While lumping ROA generation in with the other RPKI engine activities may seem a little odd at first, it's a natural consequence of the design requirement that the RPKI daemon never transmit private keys across the network in any form; given this requirement, the RPKI engine that holds the private keys for an RPKI certificate must also be the engine which generates any ROAs that derive from that RPKI certificate.

The precise content of the <route_origin/> has changed over time as the underlying ROA specification has changed. The current implementation as of this writing matches what we expect to see in draft-ietf-sidr-roa-format-03, once it is issued. In particular, note that the exactMatch boolean from the -02 draft has been replaced by the prefix and maxLength encoding used in the -03 draft.

Payload data which can be configured in a <route_origin/> object:

asn (attribute):

Autonomous System Number (ASN) to place in the generated ROA. A single ROA can only grant authorization to a single ASN; multiple ASNs require multiple ROAs, thus multiple <route_origin/> objects.

ipv4 (attribute):

List of IPv4 prefix and maxLength values, see below for format.

ipv6 (attribute):

List of IPv6 prefix and maxLength values, see below for format.

Control attributes that can be set to "yes" to force actions:

suppress_publication:

Not implemented, may be removed from protocol.

The lists of IPv4 and IPv6 prefix and maxLength values are represented as comma-separated text strings, with no whitespace permitted. Each entry in such a string represents a single prefix/maxLength pair.

ABNF for these address lists:

```
<ROAIPAddress> ::= <address> "/" <prefixlen> [ "-" <max_prefixlen> ]
                     ; Where <max_prefixlen> defaults to the same
                     ; value as <prefixlen>.

<ROAIPAddressList> ::= <ROAIPAddress> *( "," <ROAIPAddress> )
```

For example, "10.0.1.0/24-32,10.0.2.0/24", which is a shorthand form of "10.0.1.0/24-32,10.0.2.0/24-24".

7.2 Operations initiated by the RPKI engine

The left-right protocol also includes queries from the RPKI engine back to the IRDB. These queries do not follow the message-passing pattern used in the IRBE-initiated part of the protocol. Instead, there's a single query back to the IRDB, with a corresponding response. The CMS encoding are the same as in the rest of the protocol, but the BPKI certificates will be different as the back-queries and responses form a separate communication channel.

7.2.1 <list_resources/> messages

The `<list_resources/>` query and response allow the RPKI engine to ask the IRDB for information about resources assigned to a particular child. The query must include both a `"self_handle"` attribute naming the `<self/>` that is making the request and also a `"child_handle"` attribute naming the child that is the subject of the query. The query and response also allow an optional `"tag"` attribute of the same form used elsewhere in this protocol, to allow batching.

A `<list_resources/>` response includes the following attributes, along with the `tag` (if specified), `self_handle`, and `child_handle` copied from the request:

`valid_until`:

A timestamp indicating the date and time at which certificates generated by the RPKI engine for these data should expire. The timestamp is expressed as an XML `xsd:dateTime`, must be expressed in UTC, and must carry the "Z" suffix indicating UTC.

`asn`:

A list of autonomous sequence numbers, expressed as a comma-separated sequence of decimal integers with no whitespace.

`ipv4`:

A list of IPv4 address prefixes and ranges, expressed as a comma-separated list of prefixes and ranges with no whitespace. See below for format details.

`ipv6`:

A list of IPv6 address prefixes and ranges, expressed as a comma-separated list of prefixes and ranges with no whitespace. See below for format details.

Entries in a list of address prefixes and ranges can be either prefixes, which are written in the usual address/prefixlen notation, or ranges, which are expressed as a pair of addresses denoting the beginning and end of the range, written in ascending order separated by a single "-" character. This format is superficially similar to the format used

for prefix and maxLength values in the <route_origin/> object, but the semantics differ: note in particular that <route_origin/> objects don't allow ranges, while <list_resources/> messages don't allow a maxLength specification.

7.3 Error handling

Error in this protocol are handled at two levels.

Since all messages in this protocol are conveyed over HTTP connections, basic errors are indicated via the HTTP response code. 4xx and 5xx responses indicate that something bad happened. Errors that make it impossible to decode a query or encode a response are handled in this way.

Where possible, errors will result in a <report_error/> message which takes the place of the expected protocol response message. <report_error/> messages are CMS-signed XML messages like the rest of this protocol, and thus can be archived to provide an audit trail.

<report_error/> messages only appear in replies, never in queries. The <report_error/> message can appear on either the "forward" (IRBE as client of RPKI engine) or "back" (RPKI engine as client of IRDB) communication channel.

The <report_error/> message includes an optional "tag" attribute to assist in matching the error with a particular query when using batching, and also includes a "self_handle" attribute indicating the <self/> that issued the error.

The error itself is conveyed in the error_code (attribute). The value of this attribute is a token indicating the specific error that occurred. At present this will be the name of a Python exception; the production version of this protocol will nail down the allowed error tokens here, probably in the RelaxNG schema.

The body of the <report_error/> element itself is an optional text string; if present, this is debugging information. At present this capabilty is not used, debugging information goes to syslog.

8 Publication protocol

The publication protocol is really two separate client/server protocols, between different parties.

The first is a configuration protocol for an IRBE to use to configure a publication engine, the second is the interface by which authorized clients request publication of specific objects.

Much of the architecture of the publication protocol is borrowed from the left-right protocol: like the left-right protocol, the publication protocol uses CMS-wrapped XML over HTTP with the same eContentType OID and the same HTTP content-type, and

the overall style of the XML messages is very similar to the left-right protocol. All operations allow an optional "tag" attribute to allow batching.

The publication engine operates a single HTTP server which serves both of these subprotocols. The two subprotocols share a single server port, but use distinct URLs to allow demultiplexing.

8.1 Publication control subprotocol

The control subprotocol reuses the message-passing design of the left-right protocol. Configured objects support the "create", "set", "get", "list", and "destroy" actions, or a subset thereof when the full set of actions doesn't make sense.

8.1.1 <config/> object

The <config/> object allows configuration of data that apply to the entire publication server rather than a particular client.

There is exactly one <config/> object in the publication server, and it only supports the "set" and "get" actions -- it cannot be created or destroyed.

Payload data which can be configured in a <config/> object:

`bpki_crl` (element):

This is the BPKI CRL used by the publication server when signing the CMS wrapper on responses in the publication subprotocol. As the CRL must be updated at regular intervals, it's not practical to restart the publication server when the BPKI CRL needs to be updated. The BPKI model doesn't require use of a BPKI CRL between the IRBE and the publication server, so we can use the publication control subprotocol to update the BPKI CRL.

8.1.2 <client/> object

The <client/> object represents one client authorized to use the publication server.

The <client/> object supports the full set of "create", "set", "get", "list", and "destroy" actions. Each client has a "client_handle" attribute, which is used in responses and must be specified in "create", "set", "get", or "destroy" actions.

Payload data which can be configured in a <client/> object:

`base_uri` (attribute):

This is the base URI below which this client is allowed to publish data. The publication server may impose additional constraints in the case of a child publishing beneath its parent.

`bpki_cert` (element):

BPKI CA certificate for this <client/>. This is used as part of the certificate chain when validating incoming TLS and CMS messages. If the bpki_glue certificate is in use (below), the bpki_cert certificate should be issued by the bpki_glue certificate; otherwise, the bpki_cert certificate should be issued by the publication engine's bpki_ta certificate.

`bpki_glue` (element):

Another BPKI CA certificate for this <client/>, usually not needed. Certain pathological cross-certification cases require a two-certificate chain due to issuer name conflicts. If used, the bpki_glue certificate should be the issuer of the bpki_-cert certificate and should be issued by the publication engine's bpki_ta certificate; if not needed, the bpki_glue certificate should be left unset.

8.2 Publication subprotocol

The publication subprotocol is structured somewhat differently from the publication control protocol. Objects in the publication subprotocol represent objects to be published or objects to be withdrawn from publication. Each kind of object supports two actions: "publish" and "withdraw". In each case the XML element representing hte object to be published or withdrawn has a "uri" attribute which contains the publication URI. For "publish" actions, the XML element body contains the DER object to be published, encoded in Base64; for "withdraw" actions, the XML element body is empty.

In theory, the detailed access control for each kind of object might be different. In practice, as of this writing, access control for all objects is a simple check that the client's `"base_uri"` is a leading substring of the publication URI. Details of why access control might need to become more complicated are discussed in a later section.

8.2.1 <certificate/> object

The <certificate/> object represents an RPKI certificate to be published or withdrawn.

8.2.2 <crl/> object

The <crl/> object represents an RPKI CRL to be published or withdrawn.

8.2.3 <manifest/> object

The <manifest/> object represents an RPKI publication manifest to be published or withdrawn.

Note that part of the reason for the batching support in the publication protocol is because *every* publication or withdrawal action requires a new manifest, thus every publication or withdrawal action will involve at least two objects.

8.2.4 <roa/> object

The <roa/> object represents a ROA to be published or withdrawn.

8.3 Error handling

Error in this protocol are handled at two levels.

Since all messages in this protocol are conveyed over HTTP connections, basic errors are indicated via the HTTP response code. 4xx and 5xx responses indicate that something bad happened. Errors that make it impossible to decode a query or encode a response are handled in this way.

Where possible, errors will result in a <report_error/> message which takes the place of the expected protocol response message. <report_error/> messages are CMS-signed XML messages like the rest of this protocol, and thus can be archived to provide an audit trail.

<report_error/> messages only appear in replies, never in queries. The <report_error/> message can appear in both the control and publication subprotocols.

The <report_error/> message includes an optional `"tag"` attribute to assist in matching the error with a particular query when using batching.

The error itself is conveyed in the `error_code` (attribute). The value of this attribute is a token indicating the specific error that occurred. At present this will be the name of a Python exception; the production version of this protocol will nail down the allowed error tokens here, probably in the RelaxNG schema.

The body of the <report_error/> element itself is an optional text string; if present, this is debugging information. At present this capabilty is not used, debugging information goes to syslog.

8.4 Additional access control considerations.

As detailed above, the publication protocol is trivially simple. This glosses over two bits of potential complexity:

- In the case where parent and child are sharing a repository, we'd like to nest child under parent, because testing has demonstrated that even on relatively slow hardware the delays involved in setting up separate rsync connections tend to dominate synchronization time for relying parties.

- The repository operator might also want to do some checks to assure itself that what it's about to allow the RPKI engine to publish is not dangerous toxic waste.

The up-down protocol includes a mechanism by which a parent can suggest a publication URI to each of its children. The children are not required to accept this hint, and the children must make separate arrangements with the repository operator (who might or might not be the same as the entity that hosts the children's RPKI engine operations) to use the suggested publication point, but if everything works out, this allows children to nest cleanly under their parents publication points, which helps reduce synchronization time for relying parties.

In this case, one could argue that the publication server is responsible for preventing one of its clients (the child in the above description) from stomping on data published by another of its clients (the parent in the above description). This goes beyond the basic access check and requires the publication server to determine whether the parent has given its consent for the child to publish under the parent. Since the RPKI certificate profile requires the child's publication point to be indicated in an SIA extension in a certificate issued by the parent to the child, the publication engine can infer this permission from the parent's issuance of a certificate to the child. Since, by definition, the parent also uses this publication server, this is an easy check, as the publication server should already have the parent's certificate available by the time it needs to check the child's certificate.

The previous paragraph only covers a "publish" action for a <certificate/> object. For "publish" actions on other objects, the publication server would need to trace permission back to the certificate issued by the parent; for "withdraw" actions, the publication server would have to perform the same checks it would perform for a "publish" action, using the current published data before withdrawing it. The latter in turn implies an ordering constraint on "withdraw" actions in order to preserve the data necessary for these access control decisions; as this may prove impractical, the publication server may probably need to make periodic sweeps over its published data looking for orphaned objects, but that's probably a good idea anyway.

Note that, in this publication model, any agreement that the repository makes to publish the RPKI engine's output is conditional upon the object to be published passing whatever access control checks the publication server imposes.

9 SQL database schemas

- rpkid database schema
- pubd database schema
- irdbd database schema

9.1 rpkid SQL schema

Figure 1: Diagram of rpkid.sql

```
-- $Id: rpkid.sql 3745 2011-03-27 00:21:57Z sra $

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-- SQL objects needed by the RPKI engine (rpkid.py).

-- DROP TABLE commands must be in correct (reverse dependency) order
-- to satisfy FOREIGN KEY constraints.

DROP TABLE IF EXISTS ghostbuster;
DROP TABLE IF EXISTS roa_prefix;
DROP TABLE IF EXISTS roa;
DROP TABLE IF EXISTS revoked_cert;
DROP TABLE IF EXISTS child_cert;
DROP TABLE IF EXISTS child;
DROP TABLE IF EXISTS ca_detail;
DROP TABLE IF EXISTS ca;
DROP TABLE IF EXISTS parent;
DROP TABLE IF EXISTS repository;
DROP TABLE IF EXISTS bsc;
DROP TABLE IF EXISTS self;

CREATE TABLE self (
        self_id                 SERIAL NOT NULL,
        self_handle             VARCHAR(255) NOT NULL,
        use_hsm                 BOOLEAN NOT NULL DEFAULT FALSE,
        crl_interval            BIGINT UNSIGNED,
        regen_margin            BIGINT UNSIGNED,
        bpki_cert               LONGBLOB,
        bpki_glue               LONGBLOB,
        PRIMARY KEY             (self_id),
```

```
        UNIQUE                  (self_handle)
) ENGINE=InnoDB;

CREATE TABLE bsc (
        bsc_id                  SERIAL NOT NULL,
        bsc_handle              VARCHAR(255) NOT NULL,
        private_key_id          LONGBLOB,
        pkcs10_request          LONGBLOB,
        hash_alg                ENUM ('sha256'),
        signing_cert            LONGBLOB,
        signing_cert_crl        LONGBLOB,
        self_id                 BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (bsc_id),
        CONSTRAINT              bsc_self_id
        FOREIGN KEY             (self_id) REFERENCES self (self_id) ON DELETE CASCADE,
        UNIQUE                  (self_id, bsc_handle)
) ENGINE=InnoDB;

CREATE TABLE repository (
        repository_id           SERIAL NOT NULL,
        repository_handle       VARCHAR(255) NOT NULL,
        peer_contact_uri        TEXT,
        bpki_cert               LONGBLOB,
        bpki_glue               LONGBLOB,
        last_cms_timestamp      DATETIME,
        bsc_id                  BIGINT UNSIGNED NOT NULL,
        self_id                 BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (repository_id),
        CONSTRAINT              repository_self_id
        FOREIGN KEY             (self_id) REFERENCES self (self_id) ON DELETE CASCADE,
        CONSTRAINT              repository_bsc_id
        FOREIGN KEY             (bsc_id) REFERENCES bsc (bsc_id) ON DELETE CASCADE,
        UNIQUE                  (self_id, repository_handle)
) ENGINE=InnoDB;

CREATE TABLE parent (
        parent_id               SERIAL NOT NULL,
        parent_handle           VARCHAR(255) NOT NULL,
        bpki_cms_cert           LONGBLOB,
        bpki_cms_glue           LONGBLOB,
        peer_contact_uri        TEXT,
        sia_base                TEXT,
        sender_name             TEXT,
        recipient_name          TEXT,
        last_cms_timestamp      DATETIME,
        self_id                 BIGINT UNSIGNED NOT NULL,
        bsc_id                  BIGINT UNSIGNED NOT NULL,
        repository_id           BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (parent_id),
        CONSTRAINT              parent_repository_id
        FOREIGN KEY             (repository_id) REFERENCES repository (repository_id) ON DELETE CASC
        CONSTRAINT              parent_bsc_id
        FOREIGN KEY             (bsc_id) REFERENCES bsc (bsc_id) ON DELETE CASCADE,
        CONSTRAINT              parent_self_id
        FOREIGN KEY             (self_id) REFERENCES self (self_id) ON DELETE CASCADE,
        UNIQUE                  (self_id, parent_handle)
) ENGINE=InnoDB;
```

```
CREATE TABLE ca (
        ca_id                   SERIAL NOT NULL,
        last_crl_sn             BIGINT UNSIGNED NOT NULL,
        last_manifest_sn        BIGINT UNSIGNED NOT NULL,
        next_manifest_update    DATETIME,
        next_crl_update         DATETIME,
        last_issued_sn          BIGINT UNSIGNED NOT NULL,
        sia_uri                 TEXT,
        parent_resource_class   TEXT,
        parent_id               BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (ca_id),
        CONSTRAINT              ca_parent_id
        FOREIGN KEY             (parent_id) REFERENCES parent (parent_id) ON DELETE CASCADE
) ENGINE=InnoDB;

CREATE TABLE ca_detail (
        ca_detail_id            SERIAL NOT NULL,
        public_key              LONGBLOB,
        private_key_id          LONGBLOB,
        latest_crl              LONGBLOB,
        crl_published           DATETIME,
        latest_ca_cert          LONGBLOB,
        manifest_private_key_id LONGBLOB,
        manifest_public_key     LONGBLOB,
        latest_manifest_cert    LONGBLOB,
        latest_manifest         LONGBLOB,
        manifest_published      DATETIME,
        state                   ENUM ('pending', 'active', 'deprecated', 'revoked') NOT NULL,
        ca_cert_uri             TEXT,
        ca_id                   BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (ca_detail_id),
        CONSTRAINT              ca_detail_ca_id
        FOREIGN KEY             (ca_id) REFERENCES ca (ca_id) ON DELETE CASCADE
) ENGINE=InnoDB;

CREATE TABLE child (
        child_id                SERIAL NOT NULL,
        child_handle            VARCHAR(255) NOT NULL,
        bpki_cert               LONGBLOB,
        bpki_glue               LONGBLOB,
        last_cms_timestamp      DATETIME,
        self_id                 BIGINT UNSIGNED NOT NULL,
        bsc_id                  BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (child_id),
        CONSTRAINT              child_bsc_id
        FOREIGN KEY             (bsc_id) REFERENCES bsc (bsc_id) ON DELETE CASCADE,
        CONSTRAINT              child_self_id
        FOREIGN KEY             (self_id) REFERENCES self (self_id) ON DELETE CASCADE,
        UNIQUE                  (self_id, child_handle)
) ENGINE=InnoDB;

CREATE TABLE child_cert (
        child_cert_id           SERIAL NOT NULL,
        cert                    LONGBLOB NOT NULL,
        published               DATETIME,
        ski                     TINYBLOB NOT NULL,
```

```
        child_id                BIGINT UNSIGNED NOT NULL,
        ca_detail_id            BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (child_cert_id),
        CONSTRAINT              child_cert_ca_detail_id
        FOREIGN KEY             (ca_detail_id) REFERENCES ca_detail (ca_detail_id) ON DELETE CASCADE
        CONSTRAINT              child_cert_child_id
        FOREIGN KEY             (child_id) REFERENCES child (child_id) ON DELETE CASCADE
) ENGINE=InnoDB;

CREATE TABLE revoked_cert (
        revoked_cert_id         SERIAL NOT NULL,
        serial                  BIGINT UNSIGNED NOT NULL,
        revoked                 DATETIME NOT NULL,
        expires                 DATETIME NOT NULL,
        ca_detail_id            BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (revoked_cert_id),
        CONSTRAINT              revoked_cert_ca_detail_id
        FOREIGN KEY             (ca_detail_id) REFERENCES ca_detail (ca_detail_id) ON DELETE CASCADE
) ENGINE=InnoDB;

CREATE TABLE roa (
        roa_id                  SERIAL NOT NULL,
        asn                     BIGINT UNSIGNED NOT NULL,
        cert                    LONGBLOB NOT NULL,
        roa                     LONGBLOB NOT NULL,
        published               DATETIME,
        self_id                 BIGINT UNSIGNED NOT NULL,
        ca_detail_id            BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (roa_id),
        CONSTRAINT              roa_self_id
        FOREIGN KEY             (self_id) REFERENCES self (self_id) ON DELETE CASCADE,
        CONSTRAINT              roa_ca_detail_id
        FOREIGN KEY             (ca_detail_id) REFERENCES ca_detail (ca_detail_id) ON DELETE CASCADE
) ENGINE=InnoDB;

CREATE TABLE roa_prefix (
        prefix                  VARCHAR(40) NOT NULL,
        prefixlen               TINYINT UNSIGNED NOT NULL,
        max_prefixlen           TINYINT UNSIGNED NOT NULL,
        version                 TINYINT UNSIGNED NOT NULL,
        roa_id                  BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (roa_id, prefix, prefixlen, max_prefixlen),
        CONSTRAINT              roa_prefix_roa_id
        FOREIGN KEY             (roa_id) REFERENCES roa (roa_id) ON DELETE CASCADE
) ENGINE=InnoDB;

CREATE TABLE ghostbuster (
        ghostbuster_id          SERIAL NOT NULL,
        vcard                   LONGBLOB NOT NULL,
        cert                    LONGBLOB NOT NULL,
        ghostbuster             LONGBLOB NOT NULL,
        published               DATETIME,
        self_id                 BIGINT UNSIGNED NOT NULL,
        ca_detail_id            BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (ghostbuster_id),
        CONSTRAINT              ghostbuster_self_id
        FOREIGN KEY             (self_id) REFERENCES self (self_id) ON DELETE CASCADE,
```

```
        CONSTRAINT              ghostbuster_ca_detail_id
        FOREIGN KEY             (ca_detail_id) REFERENCES ca_detail (ca_detail_id) ON DELETE CASCADE
) ENGINE=InnoDB;

-- Local Variables:
-- indent-tabs-mode: nil
-- End:
```

9.2 pubd SQL Schema

Figure 2: Diagram of pubd.sql

```
-- $Id: pubd.sql 3465 2010-10-07 00:59:39Z sra $

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-- SQL objects needed by pubd.py.

-- The config table is weird because we're really only using it
-- to store one BPKI CRL, but putting this here lets us use a lot of
-- existing machinery and the alternatives are whacky in other ways.

DROP TABLE IF EXISTS client;
DROP TABLE IF EXISTS config;

CREATE TABLE config (
        config_id               SERIAL NOT NULL,
        bpki_crl                LONGBLOB,
        PRIMARY KEY             (config_id)
) ENGINE=InnoDB;

CREATE TABLE client (
        client_id               SERIAL NOT NULL,
        client_handle           VARCHAR(255) NOT NULL,
        base_uri                TEXT,
        bpki_cert               LONGBLOB,
        bpki_glue               LONGBLOB,
        last_cms_timestamp      DATETIME,
        PRIMARY KEY             (client_id),
        UNIQUE                  (client_handle)
) ENGINE=InnoDB;

-- Local Variables:
-- indent-tabs-mode: nil
-- End:
```

9.3 irdbd SQL Schema

Figure 3: Diagram of irdbd.sql

```
-- $Id: irdbd.sql 3730 2011-03-21 12:42:43Z sra $

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```

```
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-- SQL objects needed by irdbd.py.  You only need this if you're using
-- irdbd.py as your IRDB; if you have a "real" backend you can do
-- anything you like so long as you implement the relevant portion of
-- the left-right protocol.

-- DROP TABLE commands must be in correct (reverse dependency) order
-- to satisfy FOREIGN KEY constraints.

DROP TABLE IF EXISTS roa_request_prefix;
DROP TABLE IF EXISTS roa_request;
DROP TABLE IF EXISTS registrant_net;
DROP TABLE IF EXISTS registrant_asn;
DROP TABLE IF EXISTS registrant;
DROP TABLE IF EXISTS ghostbuster_request;

CREATE TABLE registrant (
        registrant_id           SERIAL NOT NULL,
        registrant_handle       VARCHAR(255) NOT NULL,
        registrant_name         TEXT,
        registry_handle         VARCHAR(255),
        valid_until             DATETIME NOT NULL,
        PRIMARY KEY             (registrant_id),
        UNIQUE                  (registry_handle, registrant_handle)
) ENGINE=InnoDB;

CREATE TABLE registrant_asn (
        registrant_asn_id       SERIAL NOT NULL,
        start_as                BIGINT UNSIGNED NOT NULL,
        end_as                  BIGINT UNSIGNED NOT NULL,
        registrant_id           BIGINT UNSIGNED NOT NULL,
```

```
        PRIMARY KEY             (registrant_asn_id),
        CONSTRAINT              registrant_asn_registrant_id
        FOREIGN KEY             (registrant_id) REFERENCES registrant (registrant_id) ON DELETE CASC
) ENGINE=InnoDB;

CREATE TABLE registrant_net (
        registrant_net_id       SERIAL NOT NULL,
        start_ip                VARCHAR(40) NOT NULL,
        end_ip                  VARCHAR(40) NOT NULL,
        version                 TINYINT UNSIGNED NOT NULL,
        registrant_id           BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (registrant_net_id),
        CONSTRAINT              registrant_net_registrant_id
        FOREIGN KEY             (registrant_id) REFERENCES registrant (registrant_id) ON DELETE CASC
) ENGINE=InnoDB;

CREATE TABLE roa_request (
        roa_request_id          SERIAL NOT NULL,
        roa_request_handle      VARCHAR(255) NOT NULL,
        asn                     BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (roa_request_id)
) ENGINE=InnoDB;

CREATE TABLE roa_request_prefix (
        prefix                  VARCHAR(40) NOT NULL,
        prefixlen               TINYINT UNSIGNED NOT NULL,
        max_prefixlen           TINYINT UNSIGNED NOT NULL,
        version                 TINYINT UNSIGNED NOT NULL,
        roa_request_id          BIGINT UNSIGNED NOT NULL,
        PRIMARY KEY             (roa_request_id, prefix, prefixlen, max_prefixlen),
        CONSTRAINT              roa_request_prefix_roa_request_id
        FOREIGN KEY             (roa_request_id) REFERENCES roa_request (roa_request_id) ON DELETE C
) ENGINE=InnoDB;

CREATE TABLE ghostbuster_request (
        ghostbuster_request_id  SERIAL NOT NULL,
        self_handle             VARCHAR(40) NOT NULL,
        parent_handle           VARCHAR(40),
        vcard                   LONGBLOB NOT NULL,
        PRIMARY KEY             (ghostbuster_request_id)
) ENGINE=InnoDB;

-- Local Variables:
-- indent-tabs-mode: nil
-- End:
```

10 BPKI model

The "business PKI" (BPKI) is the PKI used to authenticate communication on the up-down, left-right, and publication protocols.

BPKI certificates are *not* resource PKI (RPKI) certificates. The BPKI is a separate PKI that represents relationships between the various entities involved in the production side of the RPKI system. In most cases the BPKI tree will follow existing business

relationships, hence the "B" (Business) in "BPKI".

Setup of the BPKI is handled by the back end; for the most part, rpkid and pubd just use the result. The one place where the engines are directly involved in creation of new BPKI certificates is in the production of end-entity certificates for use by the engines.

For the most part an ordinary user of this package need not worry about the details explained here, as the myrpki tool takes care of all of this. However, users who want to understand what's going on behind the scenes or who have needs too complex for the myrpki tool to handle might want to understand the underlying model.

There are a few design principals that underly the chosen BPKI model:

- Each engine should rely on a single BPKI trust anchor which is controlled by the back end entity that runs the engine; all other trust material should be cross-certified into the engine's BPKI tree.
- Private keys must never transit the network.
- Except for end entity certificates, the engine should only have access to the BPKI certificates; in particular, the private key for the BPKI trust anchor should not be accessible to the engine.
- The number of BPKI keys and certificates that the engine has to manage should be no larger than is necessary.

rpkid's hosting model adds an additional constraint: rpkid's BPKI trust anchor belongs to the entity operating rpkid, but the entities hosted by rpkid should have control of their own BPKI private keys. This implies the need for an additional layer of BPKI certificate hierarchy within rpkid.

Here is a simplified picture of what the BPKI might look like for an rpkid operator that hosts two entities, "Alice" and "Ellen":

Black objects belong to the hosting entity, blue objects belong to the hosted entities, red objects are cross-certified objects from the hosted entities' peers. The arrows indicate certificate issuance: solid arrows are the ones that rpkid will care about during certificate validation, dotted arrows show the origin of the EE certificates that rpkid uses to sign CMS and TLS messages.

The certificate tree looks complicated, but the set of certificates needed to build any particular validation chain is obvious.

Detailed instructions on how to build a BPKI are beyond the scope of this document, but one can handle simple cases using the OpenSSL command line tool and cross_-certify; the latter is a tool designed specifically for the purpose of generating the cross-certification certificates needed to splice foreign trust material into a BPKI tree.

The BPKI tree for a pubd instance is similar to to the BPKI tree for an rpkid instance, but is a bit simpler, as pubd does not provide hosting in the same sense that rpkid does: pubd is a relatively simple server that publishes objects as instructed by its clients.

Here's a simplified picture of what the BPKI might look like for a pubd operator that serves two clients, "Alice" and "Bob":

While it is likely that RIRs (at least) will operate both rpkid and pubd instances, the two functions are conceptually separate. As far as pubd is concerned, it doesn't matter who operates the rpkid instance: pubd just has clients, each of which has trust material that has been cross-certified into pubd's BPKI. Similarly, rpkid doesn't really care who operates a pubd instance that it's been configured to use, it just treats that pubd as a foreign BPKI whose trust material has to be cross-certified into its own BPKI. Cross certification itself is done by the back end operator, using cross_certify or some equivalent tool; the resulting BPKI certificates are configured into rpkid and pubd via the left-right protocol and the control subprotocol of the publication protocol, respectively.

Because the BPKI tree is almost entirely controlled by the operating entity, CRLs are not necessary for most of the BPKI. The one exception to this is the EE certificates issued under the cross-certification points. These EE certificates are generated by the peer, not the local operator, and thus require CRLs. Because of this, both rpkid and pubd require regular updates of certain BPKI CRLs, again via the left-right and publication control protocols.

Because the left-right protocol and the publication control subprotocol are used to configure BPKI certificates and CRLs, they cannot themselves use certificates and CRLs configured in this way. This is why the configuration files for rpkid and pubd require

static configuration of the left-right and publication control certificates.

11 Todo List

Page Overview These explanations should be fleshed out properly.

Page The myrpki tool Er, well, rpkid doesn't, but myrpki now does -- "pure" hosting was an unused feature that fell by the wayside while simplifying the user interface. It would be relatively straightforward to add it back if we ever need it for anything, but the mechanism it used to use no longer exists -- the old [myirbe] section of the config file has been collapsed into the [myrpki] section, so testing for existance of the [myrpki] section no longer works. So we'll need an explicit configuration option, no big deal, just not worth chasing now.

12 Namespace Documentation

12.1 Package irbe_cli

Classes

- class bsc_elt
- class certificate_elt
- class child_elt
- class client_elt
- class cmd_elt_mixin
- class cmd_msg_mixin
- class config_elt
- class crl_elt
- class left_right_cms_msg
- class left_right_msg
- class left_right_proto
- class left_right_sax_handler
- class list_published_objects_elt
- class list_received_resources_elt
- class manifest_elt
- class parent_elt
- class publication_cms_msg
- class publication_msg
- class publication_proto
- class publication_sax_handler

- class reply_elt_mixin
- class report_error_elt
- class repository_elt
- class roa_elt
- class self_elt
- class UsageWrapper

Functions

- def usage

Variables

- list argv = sys.argv[1:]
- tuple cfg = rpki.config.parser(cfg_file, "irbe_cli")
- cfg_file = None
- tuple client_cert = rpki.x509.X509(Auto_file = cfg.get("rpkid-irbe-cert"))
- tuple client_key = rpki.x509.RSA(Auto_file = cfg.get("rpkid-irbe-key"))
- debug = verbose))
- pem_out = None
- proto = left_right_proto,
- q_msg = q_msg_left_right
- list q_msg_left_right = [ ]
- list q_msg_publication = [ ]
- list q_pdu = left_right_msg.pdus[argv[0]]
- tuple server_cert = rpki.x509.X509(Auto_file = cfg.get("rpkid-cert"))
- tuple server_ta = rpki.x509.X509(Auto_file = cfg.get("rpkid-bpki-ta"))
- list top_opts = ["config=", "help", "pem_out=", "quiet", "verbose"]
- tuple url = cfg.get("rpkid-url")
- tuple usage_fill = UsageWrapper(subsequent_indent = " " ∗ 4)
- verbose = True

12.1.1 Detailed Description

```
Command line IR back-end control program for rpkid and pubd.

$Id: irbe_cli.py 3711 2011-03-03 14:01:23Z sra $

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12.1.2 Function Documentation

12.1.2.1 def irbe_cli.usage (*code = 1*)

Definition at line 244 of file irbe_cli.py.

12.1.3 Variable Documentation

12.1.3.1 tuple irbe_cli::argv = sys.argv[1:]

Definition at line 264 of file irbe_cli.py.

12.1.3.2 tuple irbe_cli.cfg = rpki.config.parser(cfg_file, "irbe_cli")

Definition at line 288 of file irbe_cli.py.

12.1.3.3 irbe_cli.cfg_file = None

Definition at line 269 of file irbe_cli.py.

12.1.3.4 tuple irbe_cli::client_cert = rpki.x509.X509(Auto_file = cfg.get("rpkid-irbe-cert"))

Definition at line 314 of file irbe_cli.py.

12.1.3.5 tuple irbe_cli::client_key = rpki.x509.RSA(Auto_file = cfg.get("rpkid-irbe-key"))

Definition at line 313 of file irbe_cli.py.

12.1.3.6 irbe_cli.debug = verbose))

Definition at line 318 of file irbe_cli.py.

12.1.3.7 irbe_cli.pem_out = None

Definition at line 39 of file irbe_cli.py.

12.1.3.8 irbe_cli.proto = left_right_proto,

Definition at line 312 of file irbe_cli.py.

12.1.3.9 irbe_cli.q_msg = q_msg_left_right

Definition at line 296 of file irbe_cli.py.

12.1.3.10 list irbe_cli.q_msg_left_right = []

Definition at line 290 of file irbe_cli.py.

12.1.3.11 list irbe_cli.q_msg_publication = [ ]

Definition at line 291 of file irbe_cli.py.

12.1.3.12 list irbe_cli::q_pdu = left_right_msg.pdus[argv[0]]

Definition at line 295 of file irbe_cli.py.

12.1.3.13 tuple irbe_cli::server_cert = rpki.x509.X509(Auto_file = cfg.get("rpkid-cert"))

Definition at line 316 of file irbe_cli.py.

12.1.3.14 tuple irbe_cli::server_ta = rpki.x509.X509(Auto_file = cfg.get("rpkid-bpki-ta"))

Definition at line 315 of file irbe_cli.py.

12.1.3.15 list irbe_cli.top_opts = ["config=", "help", "pem_out=", "quiet", "verbose"]

Definition at line 242 of file irbe_cli.py.

12.1.3.16 tuple irbe_cli::url = cfg.get("rpkid-url")

Definition at line 317 of file irbe_cli.py.

12.1.3.17 tuple irbe_cli.usage_fill = UsageWrapper(subsequent_indent = " " * 4)

Definition at line 52 of file irbe_cli.py.

12.1.3.18 irbe_cli.verbose = True

Definition at line 270 of file irbe_cli.py.

12.2 Package irdbd

12.2.1 Detailed Description

```
$Id: irdbd.py 3569 2010-12-14 20:35:28Z sra $

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```

12.3 Package pubd

12.3.1 Detailed Description

```
$Id: pubd.py 3569 2010-12-14 20:35:28Z sra $

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12.4 Package rootd

12.4.1 Detailed Description

```
$Id: rootd.py 3569 2010-12-14 20:35:28Z sra $

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```

12.5 Package rpki

Packages

- package __doc__
- package adns
- package async
- package cli
- package config
- package exceptions
- package ghostbuster
- package http
- package ipaddrs
- package irdbd
- package left_right
- package log
- package manifest
- package myrpki
- package oids
- package pubd
- package publication
- package rcynic
- package relaxng
- package resource_set
- package roa
- package rootd

- package rpkid
- package sql
- package sundial
- package up_down
- package x509
- package xml_utils

12.6 Package rpki.__doc__

12.7 Package rpki.adns

Classes

- class dispatcher
- class getaddrinfo
- class query
- class test_getaddrinfo
- class test_query

Variables

- list nameservers = [ ]

  Nameservers from resolver.nameservers converted to (af, address) pairs.

- tuple resolver = dns.resolver.Resolver()

  Resolver object, shared by everything using this module.

12.7.1 Detailed Description

```
Basic asynchronous DNS code, using asyncore and Bob Halley's excellent
dnspython package.

$Id: adns.py 3465 2010-10-07 00:59:39Z sra $

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12.7.2 Variable Documentation

12.7.2.1 rpki::adns::nameservers = [ ]

Nameservers from resolver.nameservers converted to (af, address) pairs.

The latter turns out to be a more useful form for us to use internally, because it simplifies the checks we need to make upon packet receiption.

Definition at line 62 of file adns.py.

12.7.2.2 rpki::adns::resolver = dns.resolver.Resolver()

Resolver object, shared by everything using this module.

Definition at line 52 of file adns.py.

12.8 Package rpki.async

Classes

- class gc_summary
- class iterator
- class sync_wrapper
- class timer

Functions

- def _raiseExitNow
- def defer
- def event_loop
- def exit_event_loop
- def run_deferred

Variables

- list deferred_queue = [ ]

  List to hold deferred actions.

- ExitNow = asyncore.ExitNow

12.8.1 Detailed Description

```
Utilities for event-driven programming.

$Id: async.py 3793 2011-04-27 04:34:52Z sra $

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```

12.8.2 Function Documentation

12.8.2.1 def rpki.async._raiseExitNow (*signum*, *frame*) [private]

```
Signal handler for event_loop().
```

Definition at line 274 of file async.py.

12.8.2.2 def rpki.async.defer (*thunk*)

```
Defer an action until the next pass through the event loop.
```

Definition at line 255 of file async.py.

12.8.2.3 def rpki.async.event_loop (*catch_signals* = *(signal.SIGINT, signal.SIGTERM*)

```
Replacement for asyncore.loop(), adding timer and signal support.
```

Definition at line 280 of file async.py.

12.8.2.4 def rpki.async.exit_event_loop ( )

```
Force exit from event_loop().
```

Definition at line 371 of file async.py.

12.8.2.5 def rpki.async.run_deferred ( )

```
Run deferred actions.
```

Definition at line 261 of file async.py.

12.8.3 Variable Documentation

12.8.3.1 rpki::async::deferred_queue = []

List to hold deferred actions.

We used to do this with the timer queue, but that appears to confuse the garbage collector, and is overengineering for simple deferred actions in any case.

Definition at line 253 of file async.py.

12.8.3.2 rpki::async.ExitNow = asyncore.ExitNow

Definition at line 24 of file async.py.

12.9 Package rpki.cli

Classes

- class Cmd

Functions

- def yes_or_no

Variables

- dictionary _yes_or_no_prompts
- have_readline = True

12.9.1 Detailed Description

```
Utilities for writing command line tools.

$Id: cli.py 3255 2010-05-20 03:03:48Z sra $

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```

12.9.2 Function Documentation

12.9.2.1 def rpki.cli.yes_or_no (*prompt*, *default* = `None`, *require_full_word* = `False`)

```
Ask a yes-or-no question.
```

Definition at line 157 of file cli.py.

12.9.3 Variable Documentation

12.9.3.1 dictionary rpki::cli._yes_or_no_prompts

Initial value:

```
{
  True  : ' ("yes" or "no" ["yes"]) ',
  False : ' ("yes" or "no" ["no"]) ',
  None  : ' ("yes" or "no") ' }
```

Definition at line 172 of file cli.py.

12.9.3.2 rpki::cli.have_readline = True

Definition at line 25 of file cli.py.

12.10 Package rpki.config

Classes

- class parser

Variables

- default_dirname = None

  Default name of directory to check for global config file, or None if no global config file.

- string default_envname = "RPKI_CONF"

  Name of environment variable containing config file name.

- string default_filename = "rpki.conf"

  Default name of config file if caller doesn't specify one explictly.

12.10.1 Detailed Description

```
Configuration file parsing utilities, layered on top of stock Python
ConfigParser module.

$Id: config.py 3620 2011-01-20 19:59:13Z sra $

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```

12.10.2 Variable Documentation

12.10.2.1 rpki::config::default_dirname = None

Default name of directory to check for global config file, or None if no global config file.

Autoconf-generated code may set this to a non-None value during script startup.

Definition at line 48 of file config.py.

12.10.2.2 rpki::config::default_envname = "RPKI_CONF"

Name of environment variable containing config file name.

Definition at line 53 of file config.py.

12.10.2.3 rpki::config::default_filename = "rpki.conf"

Default name of config file if caller doesn't specify one explictly.

Definition at line 41 of file config.py.

12.11 Package rpki.exceptions

Classes

- class BadClassNameSyntax
- class BadClientURL
- class BadContactURL
- class BadExtension
- class BadIPResource
- class BadIRDBReply
- class BadIssueResponse
- class BadPKCS10
- class BadPublicationReply
- class BadQuery
- class BadROAPrefix
- class BadSender
- class BadStatusCode
- class BadURISyntax
- class BSCNotFound
- class BSCNotReady
- class ChildNotFound
- class ClassNameMismatch
- class ClassNameUnknown
- class ClientNotFound
- class CMSContentNotSet
- class CMSCRLNotSet
- class CMSVerificationFailed
- class CommandParseFailure
- class DBConsistancyError
- class DERObjectConversionError
- class DuplicateObject
- class EmptyPEM
- class EmptyROAPrefixList

- class ForbiddenURI
- class HandleTranslationError
- class HTTPBadVersion
- class HTTPClientAborted
- class HTTPRequestFailed
- class HTTPTimeout
- class HTTPUnexpectedState
- class MissingCMSCRL
- class MissingCMSEEcert
- class MultipleTLSEECert
- class MustBePrefix
- class NoActiveCA
- class NoCoveringCertForROA
- class NoObjectAtURI
- class NotACertificateChain
- class NotFound
- class NotImplementedYet
- class NotInDatabase
- class ReceivedTLSCACert
- class RPKI_Exception
- class ServerShuttingDown
- class SKIMismatch
- class SubprocessError
- class TLSValidationError
- class UnexpectedCMSCerts
- class UnexpectedCMSCRLs
- class UnparsableCMSDER
- class UpstreamError
- class WrongEContentType

12.11.1 Detailed Description

```
Exception definitions for RPKI modules.

$Id: exceptions.py 3465 2010-10-07 00:59:39Z sra $

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12.12 Package rpki.ghostbuster

Classes

- class Ghostbuster

12.13 Package rpki.http

Classes

- class caller
- class http_client
- class http_listener
- class http_message
- class http_queue
- class http_request
- class http_response
- class http_server
- class http_stream

Functions

- def addr_to_string
- def client
- def localhost_addrinfo
- def log_method
- def server
- def supported_address_families

Variables

- dictionary client_queues = { }

  Map of (host, port) tuples to http_queue objects.

- debug_http = False

  Verbose chatter about HTTP streams.

- tuple default_client_timeout = rpki.sundial.timedelta(minutes = 15)

  Default HTTP client connection timeout.

- tuple default_http_version = (1, 0)

  Preferred HTTP version.

- tuple default_server_timeout = rpki.sundial.timedelta(minutes = 20)

  Default HTTP server connection timeouts.

- int default_tcp_port = 80

  Default port for clients and servers that don't specify one.

- enable_ipv6_clients = False

  Whether to consider IPv6 addresses when making connections.

- enable_ipv6_servers = True

  Whether to enable IPv6 listeners.

- have_ipv6 = False

  Whether the current machine claims to support IPv6.

- string rpki_content_type = "application/x-rpki"

  HTTP content type used for all RPKI messages.

- use_adns = False

  Whether to use rpki.adns code.

- want_persistent_client = False

  Whether we want persistent HTTP client streams, when server also supports them.

- want_persistent_server = False

  Whether we want persistent HTTP server streams, when client also supports them.

12.13.1 Detailed Description

```
HTTP utilities, both client and server.

$Id: http.py 3793 2011-04-27 04:34:52Z sra $

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```

12.13.2 Function Documentation

12.13.2.1 def rpki.http.addr_to_string (*addr*)

```
Convert socket addr tuple to printable string.  Assumes 2-element
tuple is IPv4, 4-element tuple is IPv6, throws TypeError for
anything else.
```

Definition at line 285 of file http.py.

12.13.2.2 def rpki.http.client (*msg, url, callback, errback*)

```
Open client HTTP connection, send a message, set up callbacks to
handle response.
```

Definition at line 930 of file http.py.

12.13.2.3 def rpki.http.localhost_addrinfo ( )

```
Return pseudo-getaddrinfo results for localhost.
```

Definition at line 116 of file http.py.

12.13.2.4 def rpki.http.log_method (*self, msg, logger* = rpki.log.debug)

```
Logging method used in several different classes.
```

Definition at line 277 of file http.py.

12.13.2.5 def rpki.http.server (*handlers, port, host* = "")

```
Run an HTTP server and wait (forever) for connections.
```

Definition at line 973 of file http.py.

12.13.2.6 def rpki.http.supported_address_families (*enable_ipv6*)

```
IP address families on which servers should listen, and to consider
when selecting addresses for client connections.
```

Definition at line 106 of file http.py.

12.13.3 Variable Documentation

12.13.3.1 rpki::http::client_queues = {}

Map of (host, port) tuples to http_queue objects.

Definition at line 928 of file http.py.

12.13.3.2 rpki::http::debug_http = False

Verbose chatter about HTTP streams.

Definition at line 45 of file http.py.

12.13.3.3 rpki::http::default_client_timeout = rpki.sundial.timedelta(minutes = 15)

Default HTTP client connection timeout.

Definition at line 57 of file http.py.

12.13.3.4 rpki::http::default_http_version = (1, 0)

Preferred HTTP version.

Definition at line 68 of file http.py.

12.13.3.5 rpki::http::default_server_timeout = rpki.sundial.timedelta(minutes = 20)

Default HTTP server connection timeouts.

Given our druthers, we'd prefer that the client close the connection, as this avoids the problem of client starting to reuse connection just as server closes it, so this should be longer than the client timeout.

Definition at line 64 of file http.py.

12.13.3.6 rpki::http::default_tcp_port = 80

Default port for clients and servers that don't specify one.

Definition at line 72 of file http.py.

12.13.3.7 rpki::http::enable_ipv6_clients = False

Whether to consider IPv6 addresses when making connections.

Disabled by default, as IPv6 connectivity is still a bad joke in far too much of the world.

Definition at line 83 of file http.py.

12.13.3.8 rpki::http::enable_ipv6_servers = True

Whether to enable IPv6 listeners.

Enabled by default, as it should be harmless. Has no effect if kernel doesn't support IPv6.

Definition at line 77 of file http.py.

12.13.3.9 rpki::http::have_ipv6 = False

Whether the current machine claims to support IPv6.

Note that just because the kernel supports it doesn't mean that the machine has usable IPv6 connectivity. I don't know of a simple portable way to probe for connectivity at runtime (the old test of "can you ping SRI-NIC.ARPA?" seems a bit dated...). Don't set this, it's set automatically by probing using the socket() system call at runtime.

Definition at line 102 of file http.py.

12.13.3.10 rpki::http::rpki_content_type = "application/x-rpki"

HTTP content type used for all RPKI messages.

Definition at line 41 of file http.py.

12.13.3.11 rpki::http::use_adns = False

Whether to use rpki.adns code.

This is still experimental, so it's not (yet) enabled by default.

Definition at line 88 of file http.py.

12.13.3.12 rpki::http::want_persistent_client = False

Whether we want persistent HTTP client streams, when server also supports them.

Definition at line 49 of file http.py.

12.13.3.13 rpki::http::want_persistent_server = False

Whether we want persistent HTTP server streams, when client also supports them.

Definition at line 53 of file http.py.

12.14 Package rpki.ipaddrs

Classes

- class v4addr
- class v6addr

Functions

- def parse

12.14.1 Detailed Description

```
Classes to represent IP addresses.

Given some of the other operations we need to perform on them, it's
most convenient to represent IP addresses as Python "long" values.
The classes in this module just wrap suitable read/write syntax around
the underlying "long" type.

These classes also supply a "bits" attribute for use by other code
built on these classes; for the most part, IPv6 addresses really are
just IPv4 addresses with more bits, so we supply the number of bits
once, here, thus avoiding a lot of duplicate code elsewhere.

$Id: ipaddrs.py 3551 2010-11-14 23:28:45Z sra $

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```

12.14.2 Function Documentation

12.14.2.1 def rpki.ipaddrs.parse (*s*)

```
Parse a string as either an IPv4 or IPv6 address, and return object of appropriate class.
```

Definition at line 122 of file ipaddrs.py.

12.15 Package rpki.irdbd

Classes

- class main

12.15.1 Detailed Description

```
IR database daemon.

Usage: python irdbd.py [ { -c | --config } configfile ] [ { -h | --help } ]

$Id: irdbd.py 3793 2011-04-27 04:34:52Z sra $

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```

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12.16 Package rpki.left_right

Classes

- class bsc_elt
- class child_elt
- class cms_msg
- class data_elt
- class left_right_namespace
- class list_ghostbuster_requests_elt
- class list_published_objects_elt
- class list_received_resources_elt
- class list_resources_elt
- class list_roa_requests_elt
- class msg
- class parent_elt
- class report_error_elt
- class repository_elt
- class sax_handler
- class self_elt

Variables

- enforce_strict_up_down_xml_sender = False

12.16.1 Detailed Description

```
RPKI "left-right" protocol.

$Id: left_right.py 3868 2011-06-13 23:17:25Z sra $

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```

12.16.2 Variable Documentation

12.16.2.1 rpki::left_right.enforce_strict_up_down_xml_sender = False

Definition at line 40 of file left_right.py.

12.17 Package rpki.log

Classes

- class logger

Functions

- def init
- def log_repr
- def set_trace
- def trace
- def traceback

Variables

- tuple debug = logger(syslog.LOG_DEBUG)
- enable_trace = False

  Whether call tracing is enabled.

- tuple error = logger(syslog.LOG_ERR)
- tuple info = logger(syslog.LOG_INFO)
- tuple note = logger(syslog.LOG_NOTICE)
- int pid = 0
- show_python_ids = False

  Whether __repr__() methods should show Python id numbers.

- string tag = ""
- use_syslog = True

  Whether to use syslog.

- tuple warn = logger(syslog.LOG_WARNING)

12.17.1 Detailed Description

```
Logging facilities for RPKI libraries.

$Id: log.py 3793 2011-04-27 04:34:52Z sra $

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12.17.2 Function Documentation

12.17.2.1 def rpki.log.init (*ident* = *"rpki"*, *flags* = *syslog.LOG_PID*, *facility* = *syslog.LOG_DAEMON*)

Initialize logging system.

Definition at line 56 of file log.py.

12.17.2.2 def rpki.log.log_repr (*obj*, *tokens*)

Constructor for __repr__() strings, handles suppression of Python IDs as needed.

Definition at line 118 of file log.py.

12.17.2.3 def rpki.log.set_trace (*enable*)

Enable or disable call tracing.

Definition at line 68 of file log.py.

12.17.2.4 def rpki.log.trace ( )

Execution trace -- where are we now, and whence came we here?

Definition at line 96 of file log.py.

12.17.2.5 def rpki.log.traceback ( )

```
Consolidated backtrace facility with a bit of extra info.
```

Definition at line 105 of file log.py.

12.17.3 Variable Documentation

12.17.3.1 tuple rpki::log.debug = logger(syslog.LOG_DEBUG)

Definition at line 94 of file log.py.

12.17.3.2 rpki::log::enable_trace = False

Whether call tracing is enabled.

Definition at line 41 of file log.py.

12.17.3.3 tuple rpki::log.error = logger(syslog.LOG_ERR)

Definition at line 90 of file log.py.

12.17.3.4 tuple rpki::log.info = logger(syslog.LOG_INFO)

Definition at line 93 of file log.py.

12.17.3.5 tuple rpki::log.note = logger(syslog.LOG_NOTICE)

Definition at line 92 of file log.py.

12.17.3.6 int rpki::log.pid = 0

Definition at line 54 of file log.py.

12.17.3.7 rpki::log::show_python_ids = False

Whether __repr__() methods should show Python id numbers.

Definition at line 51 of file log.py.

12.17.3.8 string rpki::log.tag = ""

Definition at line 53 of file log.py.

12.17.3.9 rpki::log::use_syslog = True

Whether to use syslog.

Definition at line 46 of file log.py.

12.17.3.10 tuple rpki::log.warn = logger(syslog.LOG_WARNING)

Definition at line 91 of file log.py.

12.18 Package rpki.manifest

Classes

- class FileAndHash
- class FilesAndHashes
- class Manifest

12.18.1 Detailed Description

```
Signed manifests.  This is just the ASN.1 encoder, the rest is in
rpki.x509 with the rest of the DER_object code.

Note that rpki.x509.SignedManifest implements the signed manifest;
the structures here are just the payload of the CMS eContent field.
```

```
$Id: manifest.py 3598 2011-01-04 05:12:16Z sra $
```


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12.19 Package rpki.myrpki

Classes

- class CA
- class child
- class children
- class comma_set
- class csv_reader
- class csv_writer
- class EntityDB
- class IRDB
- class main
- class parent
- class parents
- class repositories
- class repository
- class roa_request
- class roa_requests

Functions

- def b64_equal
- def etree_post_read
- def etree_pre_write
- def etree_read
- def etree_validate
- def etree_write
- def PEMBase64
- def PEMElement

Variables

- allow_incomplete = False
- string namespace = "http://www.hactrn.net/uris/rpki/myrpki/"
- string namespaceQName = "{"
- string version = "2"
- whine = True

12.19.1 Detailed Description

```
This (oversized) module used to be an (oversized) program.
Refactoring in progress, some doc still needs updating.


This program is now the merger of three different tools: the old
myrpki.py script, the old myirbe.py script, and the newer setup.py CLI
tool.  As such, it is still in need of some cleanup, but the need to
provide a saner user interface is more urgent than internal code
prettiness at the moment.  In the long run, 90% of the code in this
file probably ought to move to well-designed library modules.

Overall goal here is to build up the configuration necessary to run
rpkid and friends, by reading a config file, a collection of .CSV
files, and the results of a few out-of-band XML setup messages
exchanged with one's parents, children, and so forth.

The config file is in an OpenSSL-compatible format, the CSV files are
simple tab-delimited text.  The XML files are all generated by this
program, either the local instance or an instance being run by another
player in the system; the mechanism used to exchange these setup
messages is outside the scope of this program, feel free to use
PGP-signed mail, a web interface (not provided), USB stick, carrier
pigeons, whatever works.

With one exception, the commands in this program avoid using any
third-party Python code other than the rpki libraries themselves; with
the same one exception, all OpenSSL work is done with the OpenSSL
command line tool (the one built as a side effect of building rcynic
will do, if your platform has no system copy or the system copy is too
old).  This is all done in an attempt to make the code more portable,
so one can run most of the RPKI back end software on a laptop or
whatever.  The one exception is the configure_daemons command, which
must, of necessity, use the same communication libraries as the
daemons with which it is conversing.  So that one command will not
work if the correct Python modules are not available.


$Id: myrpki.py 3793 2011-04-27 04:34:52Z sra $

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```

12.19.2 Function Documentation

12.19.2.1 def rpki.myrpki.b64_equal (*thing1*, *thing2*)

```
Compare two Base64-encoded values for equality.
```

Definition at line 883 of file myrpki.py.

12.19.2.2 def rpki.myrpki.etree_post_read (*e*, *validate* = **True**)

```
Do the namespace frobbing needed on read; broken out of etree_read()
beause also needed by ElementFromString().
```

Definition at line 869 of file myrpki.py.

12.19.2.3 def rpki.myrpki.etree_pre_write (*e*, *validate* = **True**)

```
Do the namespace frobbing needed on write; broken out of
etree_write() because also needed with ElementToString().
```

Definition at line 844 of file myrpki.py.

12.19.2.4 def rpki.myrpki.etree_read (*filename*, *verbose* = **False**, *validate* = **True**)

```
Read an etree from a file, verifying then stripping XML namespace
cruft.
```

Definition at line 859 of file myrpki.py.

12.19.2.5 def rpki.myrpki.etree_validate (*e*)

Definition at line 808 of file myrpki.py.

12.19.2.6 def rpki.myrpki.etree_write (*e*, *filename*, *verbose* = **False**, *validate* = **True**, *msg* = **None**)

```
Write out an etree to a file, safely.

I still miss SYSCAL(RENMWO).
```

Definition at line 825 of file myrpki.py.

12.19.2.7 def rpki.myrpki.PEMBase64 (*filename*)

```
Extract Base64 encoded data from a PEM file.
```

Definition at line 548 of file myrpki.py.

12.19.2.8 def rpki.myrpki.PEMElement (*e*, *tag*, *filename*, *kwargs*)

```
Create an XML element containing Base64 encoded data taken from a
PEM file.
```

Definition at line 561 of file myrpki.py.

12.19.3 Variable Documentation

12.19.3.1 rpki::myrpki.allow_incomplete = False

Definition at line 80 of file myrpki.py.

12.19.3.2 string rpki::myrpki.namespace = "http://www.hactrn.net/uris/rpki/myrpki/"

Definition at line 74 of file myrpki.py.

12.19.3.3 string rpki::myrpki.namespaceQName = "{"

Definition at line 76 of file myrpki.py.

12.19.3.4 string rpki::myrpki.version = "2"

Definition at line 75 of file myrpki.py.

12.19.3.5 rpki::myrpki.whine = True

Definition at line 84 of file myrpki.py.

12.20 Package rpki.oids

Variables

- tuple name2oid = dict((v, k) for k, v in oid2name.items())

  Mapping table of string names to OIDs.

- dictionary oid2name

  Mapping table of OIDs to conventional string names.

12.20.1 Detailed Description

```
OID database.

$Id: oids.py 3725 2011-03-18 03:51:12Z sra $

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```

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12.20.2 Variable Documentation

12.20.2.1 rpki::oids::name2oid = dict((v, k) for k, v in oid2name.items())

Mapping table of string names to OIDs.

Definition at line 74 of file oids.py.

12.20.2.2 rpki::oids::oid2name

Mapping table of OIDs to conventional string names.

Definition at line 39 of file oids.py.

12.21 Package rpki.pubd

Classes

- class main

12.21.1 Detailed Description

```
RPKI publication engine.

Usage: python pubd.py [ { -c | --config } configfile ]
                      [ { -h | --help } ]
                      [ { -p | --profile } outputfile ]

$Id: pubd.py 3793 2011-04-27 04:34:52Z sra $

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```

12.22 Package rpki.publication

Classes

- class certificate_elt
- class client_elt
- class cms_msg
- class config_elt
- class control_elt
- class crl_elt
- class ghostbuster_elt
- class manifest_elt
- class msg
- class publication_namespace

- class publication_object_elt
- class report_error_elt
- class roa_elt
- class sax_handler

12.22.1 Detailed Description

```
RPKI "publication" protocol.

$Id: publication.py 3793 2011-04-27 04:34:52Z sra $

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```

12.23 Package rpki.rcynic

Classes

- class NotRsyncURI
- class rcynic_certificate
- class rcynic_file_iterator
- class rcynic_ghostbuster
- class rcynic_object
- class rcynic_roa
- class rcynic_xml_iterator

- class UnknownObject

Functions

- def label_iterator

Variables

- dictionary file_name_classes
- tuple rcynic_dir = os.path.normpath(os.path.join(sys.path[0], "..", "rcynic"))

12.23.1 Detailed Description

```
Prototype of an iterator class to parse the output of an rcynic run.
This script will almost certainly move to the library package once
it's stable.

$Id: rcynic.py 3884 2011-06-17 18:50:12Z sra $

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```

12.23.2 Function Documentation

12.23.2.1 def rpki.rcynic.label_iterator (*xml_file*)

```
Returns an iterator which contains all defined labels from an rcynic XML
output file.  Each item is a tuple of the form
(label, kind, description).
```

Definition at line 241 of file rcynic.py.

12.23.3 Variable Documentation

12.23.3.1 dictionary rpki::rcynic.file_name_classes

Initial value:

```
{
  ".cer" : rcynic_certificate,
  ".gbr" : rcynic_ghostbuster,
  ".roa" : rcynic_roa }
```

Definition at line 167 of file rcynic.py.

12.23.3.2 tuple rpki::rcynic.rcynic_dir = os.path.normpath(os.path.join(sys.path[0], "..", "rcynic"))

Definition at line 253 of file rcynic.py.

12.24 Package rpki.relaxng

Variables

- tuple left_right

  Parsed RelaxNG left_right schema.

- tuple publication

  Parsed RelaxNG publication schema.

- tuple up_down

  Parsed RelaxNG up_down schema.

12.24.1 Variable Documentation

12.24.1.1 rpki::relaxng::left_right

Parsed RelaxNG left_right schema.

Definition at line 7 of file relaxng.py.

12.24.1.2 rpki::relaxng::publication

Parsed RelaxNG publication schema.

Definition at line 1265 of file relaxng.py.

12.24.1.3 rpki::relaxng::up_down

Parsed RelaxNG up_down schema.

Definition at line 1011 of file relaxng.py.

12.25 Package rpki.resource_set

Classes

- class resource_bag
- class resource_range
- class resource_range_as
- class resource_range_ip
- class resource_range_ipv4
- class resource_range_ipv6
- class resource_set
- class resource_set_as
- class resource_set_ip
- class resource_set_ipv4
- class resource_set_ipv6
- class roa_prefix
- class roa_prefix_ipv4
- class roa_prefix_ipv6
- class roa_prefix_set
- class roa_prefix_set_ipv4
- class roa_prefix_set_ipv6

Functions

- def _bs2long
- def _long2bs
- def _rsplit
- def test1

- def test2
- def test3
- def testprefix

Variables

- string inherit_token = "<inherit>"

  Token used to indicate inheritance in read and print syntax.

- tuple re_address_range = re.compile("^([0-9:.a-fA-F]+)-([0-9:.a-fA-F]+)$")
- tuple re_asn_range = re.compile("^([0-9]+)-([0-9]+)$")
- tuple re_prefix = re.compile("^([0-9:.a-fA-F]+)/([0-9]+)$")
- tuple re_prefix_with_maxlen = re.compile("^([0-9:.a-fA-F]+)/([0-9]+)-([0-9]+)$")

12.25.1 Detailed Description

```
Classes dealing with sets of resources.

The basic mechanics of a resource set are the same for any of the
resources we handle (ASNs, IPv4 addresses, or IPv6 addresses), so we
can provide the same operations on any of them, even though the
underlying details vary.

We also provide some basic set operations (union, intersection, etc).

$Id: resource_set.py 3688 2011-02-24 00:00:05Z melkins $

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```

12.25.2 Function Documentation

12.25.2.1 def rpki.resource_set._bs2long (*bs, addrlen, fill*) [private]

```
Utility function to convert a bitstring (rpki.POW.pkix tuple
representation) into a Python long.
```

Definition at line 632 of file resource_set.py.

12.25.2.2 def rpki.resource_set._long2bs (*number, addrlen, prefixlen = None, strip = None*) [private]

```
Utility function to convert a Python long into a rpki.POW.pkix tuple
bitstring.  This is a bit complicated because it supports the
fiendishly compact encoding used in RFC 3779.
```

Definition at line 644 of file resource_set.py.

12.25.2.3 def rpki.resource_set._rsplit (*rset, that*) [private]

```
Utility function to split a resource range into two resource ranges.
```

Definition at line 270 of file resource_set.py.

12.25.2.4 def rpki.resource_set.test1 (*t, s1, s2*)

Definition at line 1039 of file resource_set.py.

12.25.2.5 def rpki.resource_set.test2 (*t, s1, s2*)

Definition at line 1072 of file resource_set.py.

12.25.2.6 def rpki.resource_set.test3 (*t, s1, s2*)

Definition at line 1085 of file resource_set.py.

12.25.2.7 def rpki.resource_set.testprefix (*v*)

Definition at line 1036 of file resource_set.py.

12.25.3 Variable Documentation

12.25.3.1 rpki::resource_set::inherit_token = "<inherit>"

Token used to indicate inheritance in read and print syntax.

Definition at line 48 of file resource_set.py.

12.25.3.2 tuple rpki::resource_set.re_address_range = re.compile("^([0-9:.a-fA-F]+)-([0-9:.a-fA-F]+)$")

Definition at line 51 of file resource_set.py.

12.25.3.3 tuple rpki::resource_set.re_asn_range = re.compile("^([0-9]+)-([0-9]+)$")

Definition at line 50 of file resource_set.py.

12.25.3.4 tuple rpki::resource_set.re_prefix = re.compile("^([0-9:.a-fA-F]+)/([0-9]+)$")

Definition at line 53 of file resource_set.py.

12.25.3.5 tuple rpki::resource_set.re_prefix_with_maxlen = re.compile("^([0-9:.a-fA-F]+)/([0-9]+)-([0-9]+)$")

Definition at line 52 of file resource_set.py.

12.26 Package rpki.roa

Classes

- class ROAIPAddress
- class ROAIPAddresses
- class ROAIPAddressFamilies
- class ROAIPAddressFamily
- class RouteOriginAttestation

12.26.1 Detailed Description

```
ROA (Route Origin Authorization).

At the moment this is just the ASN.1 encoder.

This corresponds to draft-ietf-sidr-roa-format, which is a work in
progress, so this may need updating later.

$Id: roa.py 3598 2011-01-04 05:12:16Z sra $

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draft-ietf-sidr-roa-format-03 2.1.3.2 specifies:

     RouteOriginAttestation ::= SEQUENCE {
        version [0] INTEGER DEFAULT 0,
        asID  ASID,
        ipAddrBlocks SEQUENCE OF ROAIPAddressFamily }

     ASID ::= INTEGER
```

```
ROAIPAddressFamily ::= SEQUENCE {
   addressFamily OCTET STRING (SIZE (2..3)),
   addresses SEQUENCE OF ROAIPAddress }

ROAIPAddress ::= SEQUENCE {
   address IPAddress,
   maxLength INTEGER OPTIONAL }

IPAddress ::= BIT STRING
```

12.27 Package rpki.rootd

Classes

- class cms_msg
- class issue_pdu
- class list_pdu
- class main
- class message_pdu
- class revoke_pdu
- class sax_handler

Variables

- rootd = None

12.27.1 Detailed Description

```
Trivial RPKI up-down protocol root server, for testing.  Not suitable
for production use.  Overrides a bunch of method definitions from the
rpki.* classes in order to reuse as much code as possible.

Usage: python rootd.py [ { -c | --config } configfile ] [ { -h | --help } ]

$Id: rootd.py 3793 2011-04-27 04:34:52Z sra $

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12.27.2 Variable Documentation

12.27.2.1 rpki::rootd.rootd = None

Definition at line 44 of file rpki/rootd.py.

12.28 Package rpki.rpkid

Classes

- class ca_detail_obj
- class ca_obj
- class child_cert_obj
- class ghostbuster_obj
- class main
- class publication_queue
- class revoked_cert_obj
- class roa_obj

12.28.1 Detailed Description

RPKI engine daemon.

```
Usage: python rpkid.py [ { -c | --config } configfile ]
                   [ { -h | --help } ]
                   [ { -p | --profile } outputfile ]
```

$Id: rpkid.py 3793 2011-04-27 04:34:52Z sra $

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12.29 Package rpki.sql

Classes

- class session
- class sql_persistent
- class template

12.29.1 Detailed Description

SQL interface code.

$Id: sql.py 3551 2010-11-14 23:28:45Z sra $

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12.30 Package rpki.sundial

Classes

- class datetime
- class timedelta

Functions

- def _cast
- def now
- def test

12.30.1 Detailed Description

Unified RPKI date/time handling, based on the standard Python datetime module.

Module name chosen to sidestep a nightmare of import-related errors
that occur with the more obvious module names.

List of arithmetic methods that require result casting was derived by
inspection of the datetime module, to wit:

```
>>> import datetime
>>> for t in (datetime.datetime, datetime.timedelta):
...  for k in t.__dict__.keys():
...   if k.startswith("__"):
...    print "%s.%s()" % (t.__name__, k)
```

$Id: sundial.py 3783 2011-04-21 22:01:02Z sra $

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12.30.2 Function Documentation

12.30.2.1 def rpki.sundial._cast (*x*) [private]

Cast result of arithmetic operations back into correct subtype.

Definition at line 290 of file sundial.py.

12.30.2.2 def rpki.sundial.now ( )

Get current timestamp.

Definition at line 50 of file sundial.py.

12.30.2.3 def rpki.sundial.test (*t*)

Definition at line 302 of file sundial.py.

12.31 Package rpki.up_down

Classes

- class base_elt
- class certificate_elt
- class class_elt
- class class_response_syntax
- class cms_msg
- class error_response_pdu
- class issue_pdu
- class issue_response_pdu
- class list_pdu
- class list_response_pdu
- class message_pdu
- class multi_uri
- class revoke_pdu
- class revoke_response_pdu
- class revoke_syntax
- class sax_handler

Variables

- dictionary nsmap = { None : xmlns }
- string xmlns = "http://www.apnic.net/specs/rescerts/up-down/"

12.31.1 Detailed Description

```
RPKI "up-down" protocol.

$Id: up_down.py 3746 2011-03-27 01:24:39Z sra $

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12.31.2 Variable Documentation

12.31.2.1 dictionary rpki::up_down.nsmap = { None : xmlns }

Definition at line 41 of file up_down.py.

12.31.2.2 string rpki::up_down.xmlns = "http://www.apnic.net/specs/rescerts/up-down/"

Definition at line 39 of file up_down.py.

12.32 Package rpki.x509

Classes

- class CMS_object
- class CRL
- class DeadDrop
- class DER_CMS_object
- class DER_object
- class Ghostbuster
- class PEM_converter
- class PKCS10
- class ROA
- class RSA
- class RSApublic
- class SignedManifest
- class X509
- class XML_CMS_object

Functions

- def _find_xia_uri
- def base64_with_linebreaks
- def calculate_SKI
- def POWify_OID

12.32.1 Detailed Description

```
One X.509 implementation to rule them all...

...and in the darkness hide the twisty maze of partially overlapping
X.509 support packages in Python.

There are several existing packages, none of which do quite what I
need, due to age, lack of documentation, specialization, or lack of
foresight on somebody's part (perhaps mine).  This module attempts to
bring together the functionality I need in a way that hides at least
some of the nasty details.  This involves a lot of format conversion.

$Id: x509.py 3869 2011-06-14 13:17:13Z melkins $
```


```
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PERFORMANCE OF THIS SOFTWARE.
```

12.32.2 Function Documentation

12.32.2.1 def rpki.x509._find_xia_uri (*extension, name*) [private]

```
Find a rsync URI in an SIA or AIA extension.
Returns the URI if found, otherwise None.
```

Definition at line 109 of file x509.py.

12.32.2.2 def rpki.x509.base64_with_linebreaks (*der*)

```
Encode DER (really, anything) as Base64 text, with linebreaks to
keep the result (sort of) readable.
```

Definition at line 51 of file x509.py.

12.32.2.3 def rpki.x509.calculate_SKI (*public_key_der*)

```
Calculate the SKI value given the DER representation of a public
key, which requires first peeling the ASN.1 wrapper off the key.
```

Definition at line 60 of file x509.py.

12.32.2.4 def rpki.x509.POWify_OID (*oid*)

```
Utility function to convert tuple form of an OID to the
dotted-decimal string form that rpki.POW uses.
```

Definition at line 801 of file x509.py.

12.33 Package rpki.xml_utils

Classes

- class base_elt
- class data_elt
- class msg
- class sax_handler
- class text_elt

12.33.1 Detailed Description

XML utilities.

$Id: xml_utils.py 3725 2011-03-18 03:51:12Z sra $

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12.34 Package rpkid

12.34.1 Detailed Description

$Id: rpkid.py 3569 2010-12-14 20:35:28Z sra $

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13 Class Documentation

13.1 async_chat Class Reference

Inheritance diagram for async_chat:

The documentation for this class was generated from the following file:

- http.py (3793)

13.2 dispatcher Class Reference

Inheritance diagram for dispatcher:

The documentation for this class was generated from the following file:

- http.py (3793)

13.3 Cmd Class Reference

Inheritance diagram for Cmd:

The documentation for this class was generated from the following file:

- cli.py (3255)

13.4 dict Class Reference

Inheritance diagram for dict:

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.5 Exception Class Reference

Inheritance diagram for Exception:

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.6 irbe_cli.bsc_elt Class Reference

Inheritance diagram for irbe_cli.bsc_elt:

Collaboration diagram for irbe_cli.bsc_elt:

Public Member Functions

- def client_query_signing_cert
- def client_query_signing_cert_crl
- def client_reply_decode

Public Attributes

- signing_cert
- signing_cert_crl

Static Public Attributes

- tuple excludes = ("pkcs10_request",)

  XML attributes and elements that should not be allowed as command line arguments.

13.6.1 Detailed Description

Definition at line 154 of file irbe_cli.py.

13.6.2 Member Function Documentation

13.6.2.1 def irbe_cli.bsc_elt.client_query_signing_cert (*self, arg*)

```
--signing_cert option.
```

Definition at line 158 of file irbe_cli.py.

13.6.2.2 def irbe_cli.bsc_elt.client_query_signing_cert_crl (*self, arg*)

```
--signing_cert_crl option.
```

Definition at line 162 of file irbe_cli.py.

13.6.2.3 def irbe_cli.bsc_elt.client_reply_decode (*self*)

Reimplemented from irbe_cli.reply_elt_mixin.

Definition at line 166 of file irbe_cli.py.

13.6.3 Member Data Documentation

13.6.3.1 tuple irbe_cli.bsc_elt.excludes = ("pkcs10_request",) `[static]`

XML attributes and elements that should not be allowed as command line arguments.

Reimplemented from irbe_cli.cmd_elt_mixin.

Definition at line 156 of file irbe_cli.py.

13.6.3.2 irbe_cli.bsc_elt.signing_cert

Reimplemented from rpki.left_right.bsc_elt.

Definition at line 158 of file irbe_cli.py.

13.6.3.3 irbe_cli.bsc_elt.signing_cert_crl

Reimplemented from rpki.left_right.bsc_elt.

Definition at line 162 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.7 irbe_cli.certificate_elt Class Reference

Inheritance diagram for irbe_cli.certificate_elt:

Collaboration diagram for irbe_cli.certificate_elt:

13.7.1 Detailed Description

Definition at line 215 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.8 irbe_cli.child_elt Class Reference

Inheritance diagram for irbe_cli.child_elt:

Collaboration diagram for irbe_cli.child_elt:

13.8.1 Detailed Description

Definition at line 176 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.9 irbe_cli.client_elt Class Reference

Inheritance diagram for irbe_cli.client_elt:

Collaboration diagram for irbe_cli.client_elt:

13.9.1 Detailed Description

Definition at line 212 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.10 irbe_cli.cmd_elt_mixin Class Reference

Inheritance diagram for irbe_cli.cmd_elt_mixin:

Collaboration diagram for irbe_cli.cmd_elt_mixin:

Public Member Functions

- def client_getopt
- def client_query_bpki_cert
- def client_query_bpki_cms_cert
- def client_query_cms_glue
- def client_query_glue
- def usage

Public Attributes

- bpki_cert
- bpki_cms_cert
- bpki_cms_glue
- bpki_glue

Static Public Attributes

- tuple excludes = ()

  XML attributes and elements that should not be allowed as command line arguments.

- is_cmd = True

13.10.1 Detailed Description

```
Protocol mix-in for command line client element PDUs.
```

Definition at line 70 of file irbe_cli.py.

13.10.2 Member Function Documentation

13.10.2.1 def irbe_cli.cmd_elt_mixin.client_getopt (*self, argv*)

```
Parse options for this class.
```

Definition at line 94 of file irbe_cli.py.

13.10.2.2 def irbe_cli.cmd_elt_mixin.client_query_bpki_cert (*self, arg*)

```
Special handler for --bpki_cert option.
```

Definition at line 111 of file irbe_cli.py.

13.10.2.3 def irbe_cli.cmd_elt_mixin.client_query_bpki_cms_cert (*self, arg*)

```
Special handler for --bpki_cms_cert option.
```

Definition at line 123 of file irbe_cli.py.

13.10.2.4 def irbe_cli.cmd_elt_mixin.client_query_cms_glue (*self, arg*)

```
Special handler for --bpki_cms_glue option.
```

Definition at line 129 of file irbe_cli.py.

13.10.2.5 def irbe_cli.cmd_elt_mixin.client_query_glue (*self, arg*)

```
Special handler for --bpki_glue option.
```

Definition at line 117 of file irbe_cli.py.

13.10.2.6 def irbe_cli.cmd_elt_mixin.usage (*cls*)

```
Generate usage message for this PDU.
```

Definition at line 83 of file irbe_cli.py.

13.10.3 Member Data Documentation

13.10.3.1 irbe_cli.cmd_elt_mixin.bpki_cert

Definition at line 113 of file irbe_cli.py.

13.10.3.2 irbe_cli.cmd_elt_mixin.bpki_cms_cert

Definition at line 125 of file irbe_cli.py.

13.10.3.3 irbe_cli.cmd_elt_mixin.bpki_cms_glue

Definition at line 131 of file irbe_cli.py.

13.10.3.4 irbe_cli.cmd_elt_mixin.bpki_glue

Definition at line 119 of file irbe_cli.py.

13.10.3.5 irbe_cli.cmd_elt_mixin::excludes = () `[static]`

XML attributes and elements that should not be allowed as command line arguments.

Reimplemented in irbe_cli.bsc_elt, irbe_cli.list_published_objects_elt, and irbe_cli.list_received_resources_elt.

Definition at line 80 of file irbe_cli.py.

13.10.3.6 irbe_cli.cmd_elt_mixin.is_cmd = True `[static]`

Reimplemented from irbe_cli.reply_elt_mixin.

Definition at line 75 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.11 irbe_cli.cmd_msg_mixin Class Reference

Inheritance diagram for irbe_cli.cmd_msg_mixin:

Collaboration diagram for irbe_cli.cmd_msg_mixin:

Public Member Functions

- def usage

13.11.1 Detailed Description

```
Protocol mix-in for command line client message PDUs.
```

Definition at line 135 of file irbe_cli.py.

13.11.2 Member Function Documentation

13.11.2.1 def irbe_cli.cmd_msg_mixin.usage (*cls*)

```
Generate usage message for this PDU.
```

Definition at line 141 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.12 irbe_cli.config_elt Class Reference

Inheritance diagram for irbe_cli.config_elt:

Collaboration diagram for irbe_cli.config_elt:

Public Member Functions

- def client_query_bpki_crl

Public Attributes

- bpki_crl

13.12.1 Detailed Description

Definition at line 204 of file irbe_cli.py.

13.12.2 Member Function Documentation

13.12.2.1 def irbe_cli.config_elt.client_query_bpki_crl (*self, arg*)

```
Special handler for --bpki_crl option.
```

Definition at line 206 of file irbe_cli.py.

13.12.3 Member Data Documentation

13.12.3.1 irbe_cli.config_elt.bpki_crl

Definition at line 208 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.13 irbe_cli.crl_elt Class Reference

Inheritance diagram for irbe_cli.crl_elt:

Collaboration diagram for irbe_cli.crl_elt:

13.13.1 Detailed Description

Definition at line 218 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.14 irbe_cli.left_right_cms_msg Class Reference

Inheritance diagram for irbe_cli.left_right_cms_msg:

Collaboration diagram for irbe_cli.left_right_cms_msg:

Static Public Attributes

- saxify = left_right_sax_handler.saxify

13.14.1 Detailed Description

Definition at line 199 of file irbe_cli.py.

13.14.2 Member Data Documentation

13.14.2.1 irbe_cli.left_right_cms_msg.saxify = left_right_sax_handler.saxify [static]

Reimplemented from rpki.left_right.cms_msg.

Definition at line 200 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.15 irbe_cli.left_right_msg Class Reference

Inheritance diagram for irbe_cli.left_right_msg:

Collaboration diagram for irbe_cli.left_right_msg:

Static Public Attributes

- tuple pdus

  Dispatch table of PDUs for this protocol.

13.15.1 Detailed Description

Definition at line 191 of file irbe_cli.py.

13.15.2 Member Data Documentation

13.15.2.1 tuple irbe_cli.left_right_msg.pdus [static]

Initial value:

```
dict((x.element_name, x)
              for x in (self_elt, bsc_elt, parent_elt, child_elt, repository_elt,

                        list_published_objects_elt, list_received_resources_elt,
      report_error_elt))
```

Dispatch table of PDUs for this protocol.

Reimplemented from rpki.left_right.msg.

Definition at line 192 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.16 irbe_cli.left_right_proto Class Reference

Inheritance diagram for irbe_cli.left_right_proto:

Collaboration diagram for irbe_cli.left_right_proto:

Static Public Attributes

- cms_msg = left_right_cms_msg
- msg = left_right_msg

13.16.1 Detailed Description

Definition at line 307 of file irbe_cli.py.

13.16.2 Member Data Documentation

13.16.2.1 irbe_cli.left_right_proto.cms_msg = left_right_cms_msg [static]

Definition at line 308 of file irbe_cli.py.

13.16.2.2 irbe_cli.left_right_proto.msg = left_right_msg [static]

Definition at line 309 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.17 irbe_cli.left_right_sax_handler Class Reference

Inheritance diagram for irbe_cli.left_right_sax_handler:

Collaboration diagram for irbe_cli.left_right_sax_handler:

Static Public Attributes

- pdu = left_right_msg

13.17.1 Detailed Description

Definition at line 196 of file irbe_cli.py.

13.17.2 Member Data Documentation

13.17.2.1 irbe_cli.left_right_sax_handler.pdu = left_right_msg [static]

Reimplemented from rpki.left_right.sax_handler.

Definition at line 197 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.18 irbe_cli.list_published_objects_elt Class Reference

Inheritance diagram for irbe_cli.list_published_objects_elt:

Collaboration diagram for irbe_cli.list_published_objects_elt:

Static Public Attributes

- tuple excludes = ("uri",)

  XML attributes and elements that should not be allowed as command line arguments.

13.18.1 Detailed Description

Definition at line 182 of file irbe_cli.py.

13.18.2 Member Data Documentation

13.18.2.1 tuple irbe_cli.list_published_objects_elt.excludes = ("uri",) [static]

XML attributes and elements that should not be allowed as command line arguments.

Reimplemented from irbe_cli.cmd_elt_mixin.

Definition at line 183 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.19 irbe_cli.list_received_resources_elt Class Reference

Inheritance diagram for irbe_cli.list_received_resources_elt:

Collaboration diagram for irbe_cli.list_received_resources_elt:

Static Public Attributes

- tuple excludes = ("parent_handle", "notBefore", "notAfter", "uri", "sia_uri", "aia_-uri", "asn", "ipv4", "ipv6")

  XML attributes and elements that should not be allowed as command line arguments.

13.19.1 Detailed Description

Definition at line 185 of file irbe_cli.py.

13.19.2 Member Data Documentation

13.19.2.1 tuple irbe_cli.list_received_resources_elt.excludes = ("parent_handle", "notBefore", "notAfter", "uri", "sia_uri", "aia_uri", "asn", "ipv4", "ipv6") [static]

XML attributes and elements that should not be allowed as command line arguments.

Reimplemented from irbe_cli.cmd_elt_mixin.

Definition at line 186 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.20 irbe_cli.manifest_elt Class Reference

Inheritance diagram for irbe_cli.manifest_elt:

Collaboration diagram for irbe_cli.manifest_elt:

13.20.1 Detailed Description

Definition at line 221 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.21 irbe_cli.parent_elt Class Reference

Inheritance diagram for irbe_cli.parent_elt:

Collaboration diagram for irbe_cli.parent_elt:

13.21.1 Detailed Description

Definition at line 173 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.22 irbe_cli.publication_cms_msg Class Reference

Inheritance diagram for irbe_cli.publication_cms_msg:

Collaboration diagram for irbe_cli.publication_cms_msg:

Static Public Attributes

- saxify = publication_sax_handler.saxify

13.22.1 Detailed Description

Definition at line 237 of file irbe_cli.py.

13.22.2 Member Data Documentation

13.22.2.1 irbe_cli.publication_cms_msg.saxify = publication_sax_handler.saxify [static]

Reimplemented from rpki.publication.cms_msg.

Definition at line 238 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.23 irbe_cli.publication_msg Class Reference

Inheritance diagram for irbe_cli.publication_msg:

Collaboration diagram for irbe_cli.publication_msg:

Static Public Attributes

- tuple pdus

  Dispatch table of PDUs for this protocol.

13.23.1 Detailed Description

Definition at line 230 of file irbe_cli.py.

13.23.2 Member Data Documentation

13.23.2.1 tuple irbe_cli.publication_msg.pdus [static]

Initial value:

```
dict((x.element_name, x)
              for x in (config_elt, client_elt, certificate_elt, crl_elt, manifes
      t_elt, roa_elt, report_error_elt))
```

Dispatch table of PDUs for this protocol.

Reimplemented from rpki.publication.msg.

Definition at line 231 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.24 irbe_cli.publication_proto Class Reference

Inheritance diagram for irbe_cli.publication_proto:

Collaboration diagram for irbe_cli.publication_proto:

Static Public Attributes

- cms_msg = publication_cms_msg
- msg = publication_msg

13.24.1 Detailed Description

Definition at line 324 of file irbe_cli.py.

13.24.2 Member Data Documentation

13.24.2.1 irbe_cli.publication_proto.cms_msg = publication_cms_msg [static]

Definition at line 326 of file irbe_cli.py.

13.24.2.2 irbe_cli.publication_proto.msg = publication_msg [static]

Definition at line 325 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.25 irbe_cli.publication_sax_handler Class Reference

Inheritance diagram for irbe_cli.publication_sax_handler:

Collaboration diagram for irbe_cli.publication_sax_handler:

Static Public Attributes

- pdu = publication_msg

13.25.1 Detailed Description

Definition at line 234 of file irbe_cli.py.

13.25.2 Member Data Documentation

13.25.2.1 irbe_cli.publication_sax_handler.pdu = publication_msg [static]

Reimplemented from rpki.publication.sax_handler.

Definition at line 235 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.26 irbe_cli.reply_elt_mixin Class Reference

Inheritance diagram for irbe_cli.reply_elt_mixin:

Collaboration diagram for irbe_cli.reply_elt_mixin:

Public Member Functions

- def client_reply_decode
- def client_reply_show

Static Public Attributes

- is_cmd = False

13.26.1 Detailed Description

```
Protocol mix-in for printout of reply PDUs.
```

Definition at line 54 of file irbe_cli.py.

13.26.2 Member Function Documentation

13.26.2.1 def irbe_cli.reply_elt_mixin.client_reply_decode (*self*)

Reimplemented in irbe_cli.bsc_elt.

Definition at line 61 of file irbe_cli.py.

13.26.2.2 def irbe_cli.reply_elt_mixin.client_reply_show (*self*)

Definition at line 64 of file irbe_cli.py.

13.26.3 Member Data Documentation

13.26.3.1 irbe_cli.reply_elt_mixin.is_cmd = False `[static]`

Reimplemented in irbe_cli.cmd_elt_mixin.

Definition at line 59 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.27 irbe_cli.report_error_elt Class Reference

Inheritance diagram for irbe_cli.report_error_elt:

Collaboration diagram for irbe_cli.report_error_elt:

13.27.1 Detailed Description

Definition at line 188 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.28 irbe_cli.repository_elt Class Reference

Inheritance diagram for irbe_cli.repository_elt:

Collaboration diagram for irbe_cli.repository_elt:

13.28.1 Detailed Description

Definition at line 179 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.29 irbe_cli.roa_elt Class Reference

Inheritance diagram for irbe_cli.roa_elt:

Collaboration diagram for irbe_cli.roa_elt:

13.29.1 Detailed Description

Definition at line 224 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.30 irbe_cli.self_elt Class Reference

Inheritance diagram for irbe_cli.self_elt:

Collaboration diagram for irbe_cli.self_elt:

13.30.1 Detailed Description

Definition at line 151 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.31 irbe_cli.UsageWrapper Class Reference

Inheritance diagram for irbe_cli.UsageWrapper:

Collaboration diagram for irbe_cli.UsageWrapper:

Public Member Functions

- def __call__

13.31.1 Detailed Description

```
Call interface around Python textwrap.Textwrapper class.
```

Definition at line 41 of file irbe_cli.py.

13.31.2 Member Function Documentation

13.31.2.1 def irbe_cli.UsageWrapper.__call__ (*self, args*)

```
Format arguments, with TextWrapper indentation.
```

Definition at line 46 of file irbe_cli.py.

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.32 long Class Reference

Inheritance diagram for long:

The documentation for this class was generated from the following file:

- ipaddrs.py (3551)

13.33 object Class Reference

Inheritance diagram for object:

The documentation for this class was generated from the following file:

- x509.py (3869)

13.34 OctetString Class Reference

Inheritance diagram for OctetString:

The documentation for this class was generated from the following file:

- ghostbuster.py (3860)

13.35 datetime Class Reference

Inheritance diagram for datetime:

The documentation for this class was generated from the following file:

- sundial.py (3783)

13.36 timedelta Class Reference

Inheritance diagram for timedelta:

The documentation for this class was generated from the following file:

- sundial.py (3783)

13.37 rpki.adns.dispatcher Class Reference

Inheritance diagram for rpki.adns.dispatcher:

Collaboration diagram for rpki.adns.dispatcher:

Public Member Functions

- def __init__
- def handle_connect
- def handle_error
- def handle_read
- def writable

Public Attributes

- af

- bufsize
- cb
- eb

13.37.1 Detailed Description

```
Basic UDP socket reader for use with asyncore.
```

Definition at line 77 of file adns.py.

13.37.2 Constructor & Destructor Documentation

13.37.2.1 def rpki.adns.dispatcher.__init__ (*self, cb, eb, af, bufsize = 65535*)

Definition at line 82 of file adns.py.

13.37.3 Member Function Documentation

13.37.3.1 def rpki.adns.dispatcher.handle_connect (*self*)

```
Quietly ignore UDP "connection" events.
```

Definition at line 103 of file adns.py.

13.37.3.2 def rpki.adns.dispatcher.handle_error (*self*)

```
Pass errors to query class errback.
```

Definition at line 97 of file adns.py.

13.37.3.3 def rpki.adns.dispatcher.handle_read (*self*)

```
Receive a packet, hand it off to query class callback.
```

Definition at line 90 of file adns.py.

13.37.3.4 def rpki.adns.dispatcher.writable (*self*)

```
We don't need to hear about UDP socket becoming writable.
```

Definition at line 109 of file adns.py.

13.37.4 Member Data Documentation

13.37.4.1 rpki.adns.dispatcher.af

Definition at line 82 of file adns.py.

13.37.4.2 rpki.adns.dispatcher.bufsize

Definition at line 82 of file adns.py.

13.37.4.3 rpki.adns.dispatcher.cb

Definition at line 82 of file adns.py.

13.37.4.4 rpki.adns.dispatcher.eb

Definition at line 82 of file adns.py.

The documentation for this class was generated from the following file:

- adns.py (3465)

13.38 rpki.adns.getaddrinfo Class Reference

Inheritance diagram for rpki.adns.getaddrinfo:

Collaboration diagram for rpki.adns.getaddrinfo:

Public Member Functions

- def __init__
- def done
- def lose

Public Attributes

- cb
- eb

- host
- queries
- result

Static Public Attributes

- dictionary typemap

13.38.1 Detailed Description

Definition at line 294 of file adns.py.

13.38.2 Constructor & Destructor Documentation

13.38.2.1 def rpki.adns.getaddrinfo.__init__ (*self, cb, eb, host, address_families* = `typemap.values()`)

Definition at line 299 of file adns.py.

13.38.3 Member Function Documentation

13.38.3.1 def rpki.adns.getaddrinfo.done (*self, q, answer*)

Definition at line 308 of file adns.py.

13.38.3.2 def rpki.adns.getaddrinfo.lose (*self, q, e*)

Definition at line 316 of file adns.py.

13.38.4 Member Data Documentation

13.38.4.1 rpki.adns.getaddrinfo.cb

Definition at line 299 of file adns.py.

13.38.4.2 rpki.adns.getaddrinfo.eb

Definition at line 299 of file adns.py.

13.38.4.3 rpki.adns.getaddrinfo.host

Definition at line 299 of file adns.py.

13.38.4.4 rpki.adns.getaddrinfo.queries

Definition at line 299 of file adns.py.

13.38.4.5 rpki.adns.getaddrinfo.result

Definition at line 299 of file adns.py.

13.38.4.6 dictionary rpki.adns.getaddrinfo.typemap [static]

Initial value:

```
{ dns.rdatatype.A    : socket.AF_INET,
              dns.rdatatype.AAAA : socket.AF_INET6 }
```

Definition at line 296 of file adns.py.

The documentation for this class was generated from the following file:

- adns.py (3465)

13.39 rpki.adns.query Class Reference

Inheritance diagram for rpki.adns.query:

Collaboration diagram for rpki.adns.query:

Public Member Functions

- def __init__
- def cleanup
- def done1
- def done2
- def go
- def loop1
- def loop2
- def lose
- def socket_cb
- def socket_eb
- def socket_timeout

Public Attributes

- backoff
- cb
- eb
- iterator
- nameservers
- qclass
- qname
- qtype
- request
- response
- sockets
- start
- timer

13.39.1 Detailed Description

```
Simplified (no search paths) asynchronous adaptation of
dns.resolver.Resolver.query() (q.v.).
```

Definition at line 116 of file adns.py.

13.39.2 Constructor & Destructor Documentation

13.39.2.1 def rpki.adns.query.__init__ (*self, cb, eb, qname, qtype* = `dns.rdatatype.A`, *qclass* = `dns.rdataclass.IN`)

Definition at line 122 of file adns.py.

13.39.3 Member Function Documentation

13.39.3.1 def rpki.adns.query.cleanup (*self*)

```
Shut down our timer and sockets.
```

Definition at line 258 of file adns.py.

13.39.3.2 def rpki.adns.query.done1 (*self*)

```
Done with outer loop.  If we got a useful answer, cache it, then
pass it back to caller; if we got an error, pass the appropriate
exception back to caller.
```

Definition at line 273 of file adns.py.

13.39.3.3 def rpki.adns.query.done2 (*self*)

```
Done with inner loop.  If we still haven't got an answer and
haven't (yet?) eliminated all of our nameservers, wait a little
while before starting the cycle again, unless we've hit the
timeout threshold for the whole query.
```

Definition at line 239 of file adns.py.

13.39.3.4 def rpki.adns.query.go (*self*)

```
Start running the query.  Check our cache before doing network
query; if we find an answer there, just return it.  Otherwise
start the network query.
```

Definition at line 138 of file adns.py.

13.39.3.5 def rpki.adns.query.loop1 (*self*)

```
Outer loop.  If we haven't got a response yet and still have
nameservers to check, start inner loop.  Otherwise, we're done.
```

Definition at line 162 of file adns.py.

13.39.3.6 def rpki.adns.query.loop2 (*self, iterator, nameserver*)

```
Inner loop.  Send query to next nameserver in our list, unless
we've hit the overall timeout for this query.
```

Definition at line 173 of file adns.py.

13.39.3.7 def rpki.adns.query.lose (*self, e*)

```
Something bad happened.  Clean up, then pass error back to caller.
```

Definition at line 266 of file adns.py.

13.39.3.8 def rpki.adns.query.socket_cb (*self, af, from_host, from_port, wire*)

```
Received a packet that might be a DNS message.  If it doesn't look
like it came from one of our nameservers, just drop it and leave
the timer running.  Otherwise, try parsing it: if it's an answer,
we're done, otherwise handle error appropriately and move on to
next nameserver.
```

Definition at line 213 of file adns.py.

13.39.3.9 def rpki.adns.query.socket_eb (*self, e*)

```
UDP socket signaled error.  If it really is some kind of socket
error, handle as if we've timed out on this nameserver; otherwise,
pass error back to caller.
```

Definition at line 200 of file adns.py.

13.39.3.10 def rpki.adns.query.socket_timeout (*self*)

```
No answer from nameserver, move on to next one (inner loop).
```

Definition at line 193 of file adns.py.

13.39.4 Member Data Documentation

13.39.4.1 rpki.adns.query.backoff

Definition at line 142 of file adns.py.

13.39.4.2 rpki.adns.query.cb

Definition at line 122 of file adns.py.

13.39.4.3 rpki.adns.query.eb

Definition at line 122 of file adns.py.

13.39.4.4 rpki.adns.query.iterator

Definition at line 165 of file adns.py.

13.39.4.5 rpki.adns.query.nameservers

Definition at line 142 of file adns.py.

13.39.4.6 rpki.adns.query.qclass

Definition at line 122 of file adns.py.

13.39.4.7 rpki.adns.query.qname

Definition at line 122 of file adns.py.

13.39.4.8 rpki.adns.query.qtype

Definition at line 122 of file adns.py.

13.39.4.9 rpki.adns.query.request

Definition at line 142 of file adns.py.

13.39.4.10 rpki.adns.query.response

Definition at line 142 of file adns.py.

13.39.4.11 rpki.adns.query.sockets

Definition at line 142 of file adns.py.

13.39.4.12 rpki.adns.query.start

Definition at line 122 of file adns.py.

13.39.4.13 rpki.adns.query.timer

Definition at line 142 of file adns.py.

The documentation for this class was generated from the following file:

- adns.py (3465)

13.40 rpki.adns.test_getaddrinfo Class Reference

Inheritance diagram for rpki.adns.test_getaddrinfo:

Collaboration diagram for rpki.adns.test_getaddrinfo:

Public Member Functions

- def __init__
- def done
- def lose

Public Attributes

- qname

13.40.1 Detailed Description

Definition at line 329 of file adns.py.

13.40.2 Constructor & Destructor Documentation

13.40.2.1 def rpki.adns.test_getaddrinfo.__init__ (*self, qname*)

Definition at line 331 of file adns.py.

13.40.3 Member Function Documentation

13.40.3.1 def rpki.adns.test_getaddrinfo.done (*self, result*)

Definition at line 335 of file adns.py.

13.40.3.2 def rpki.adns.test_getaddrinfo.lose (*self, e*)

Definition at line 340 of file adns.py.

13.40.4 Member Data Documentation

13.40.4.1 rpki.adns.test_getaddrinfo.qname

Definition at line 331 of file adns.py.

The documentation for this class was generated from the following file:

- adns.py (3465)

13.41 rpki.adns.test_query Class Reference

Inheritance diagram for rpki.adns.test_query:

Collaboration diagram for rpki.adns.test_query:

Public Member Functions

- def __init__
- def done
- def lose

Public Attributes

- qclass
- qname
- qtype

13.41.1 Detailed Description

Definition at line 343 of file adns.py.

13.41.2 Constructor & Destructor Documentation

13.41.2.1 def rpki.adns.test_query.__init__ (*self, qname, qtype* = `dns.rdatatype.A`, *qclass* = `dns.rdataclass.IN`)

Definition at line 345 of file adns.py.

13.41.3 Member Function Documentation

13.41.3.1 def rpki.adns.test_query.done (*self, q, result*)

Definition at line 351 of file adns.py.

13.41.3.2 def rpki.adns.test_query.lose (*self, q, e*)

Definition at line 358 of file adns.py.

13.41.4 Member Data Documentation

13.41.4.1 rpki.adns.test_query.qclass

Definition at line 345 of file adns.py.

13.41.4.2 rpki.adns.test_query.qname

Definition at line 345 of file adns.py.

13.41.4.3 rpki.adns.test_query.qtype

Definition at line 345 of file adns.py.

The documentation for this class was generated from the following file:

- adns.py (3465)

13.42 rpki.async.gc_summary Class Reference

Inheritance diagram for rpki.async.gc_summary:

Collaboration diagram for rpki.async.gc_summary:

Public Member Functions

- def __init__
- def handler

Public Attributes

- interval
- threshold
- timer

13.42.1 Detailed Description

```
Periodic summary of GC state, for tracking down memory bloat.
```

Definition at line 377 of file async.py.

13.42.2 Constructor & Destructor Documentation

13.42.2.1 def rpki.async.gc_summary.__init__ (*self, interval, threshold = 0*)

Definition at line 382 of file async.py.

13.42.3 Member Function Documentation

13.42.3.1 def rpki.async.gc_summary.handler (*self*)

```
Collect and log GC state for this period, reset timer.
```

Definition at line 390 of file async.py.

13.42.4 Member Data Documentation

13.42.4.1 rpki.async.gc_summary.interval

Definition at line 382 of file async.py.

13.42.4.2 rpki.async.gc_summary.threshold

Definition at line 382 of file async.py.

13.42.4.3 rpki.async.gc_summary.timer

Definition at line 382 of file async.py.

The documentation for this class was generated from the following file:

- async.py (3793)

13.43 rpki.async.iterator Class Reference

Inheritance diagram for rpki.async.iterator:

Collaboration diagram for rpki.async.iterator:

Public Member Functions

- def __call__
- def __init__
- def __repr__
- def doit

Public Attributes

- caller_function
- done_callback

- item_callback
- iterator
- unwind_stack

13.43.1 Detailed Description

```
Iteration construct for event-driven code.  Takes three
arguments:

- Some kind of iterable object

- A callback to call on each item in the iteration

- A callback to call after the iteration terminates.

The item callback receives two arguments: the callable iterator
object and the current value of the iteration.  It should call the
iterator (or arrange for the iterator to be called) when it is time
to continue to the next item in the iteration.

The termination callback receives no arguments.
```

Definition at line 26 of file async.py.

13.43.2 Constructor & Destructor Documentation

13.43.2.1 def rpki.async.iterator.__init__ (*self, iterable, item_callback, done_callback, unwind_stack* = `True`)

Definition at line 45 of file async.py.

13.43.3 Member Function Documentation

13.43.3.1 def rpki.async.iterator.__call__ (*self*)

Definition at line 64 of file async.py.

13.43.3.2 def rpki.async.iterator.__repr__ (*self*)

Definition at line 59 of file async.py.

13.43.3.3 def rpki.async.iterator.doit (*self*)

```
Implement the iterator protocol: attempt to call the item handler
with the next iteration value, call the termination handler if the
iterator signaled StopIteration.
```

Definition at line 70 of file async.py.

13.43.4 Member Data Documentation

13.43.4.1 rpki.async.iterator.caller_function

Definition at line 45 of file async.py.

13.43.4.2 rpki.async.iterator.done_callback

Definition at line 45 of file async.py.

13.43.4.3 rpki.async.iterator.item_callback

Definition at line 45 of file async.py.

13.43.4.4 rpki.async.iterator.iterator

Definition at line 45 of file async.py.

13.43.4.5 rpki.async.iterator.unwind_stack

Definition at line 45 of file async.py.

The documentation for this class was generated from the following file:

- async.py (3793)

13.44 rpki.async.sync_wrapper Class Reference

Inheritance diagram for rpki.async.sync_wrapper:

Collaboration diagram for rpki.async.sync_wrapper:

Public Member Functions

- def __call__
- def __init__
- def cb
- def eb

Public Attributes

- func

Static Public Attributes

- err = None
- res = None

13.44.1 Detailed Description

```
Synchronous wrapper around asynchronous functions.  Running in
asynchronous mode at all times makes sense for event-driven daemons,
but is kind of tedious for simple scripts, hence this wrapper.

The wrapped function should take at least two arguments: a callback
function and an errback function.  If any arguments are passed to
the wrapper, they will be passed as additional arguments to the
wrapped function.
```

Definition at line 312 of file async.py.

13.44.2 Constructor & Destructor Documentation

13.44.2.1 def rpki.async.sync_wrapper.__init__ (*self, func*)

Definition at line 327 of file async.py.

13.44.3 Member Function Documentation

13.44.3.1 def rpki.async.sync_wrapper.__call__ (*self, args, kwargs*)

Definition at line 347 of file async.py.

13.44.3.2 def rpki.async.sync_wrapper.cb (*self, res* = `None`)

```
Wrapped code has requested normal termination.  Store result, and
exit the event loop.
```

Definition at line 330 of file async.py.

13.44.3.3 def rpki.async.sync_wrapper.eb (*self, err*)

```
Wrapped code raised an exception.  Store exception data, then exit
the event loop.
```

Definition at line 338 of file async.py.

13.44.4 Member Data Documentation

13.44.4.1 rpki.async.sync_wrapper.err = None [static]

Definition at line 325 of file async.py.

13.44.4.2 rpki.async.sync_wrapper.func

Definition at line 327 of file async.py.

13.44.4.3 rpki.async.sync_wrapper.res = None [static]

Definition at line 324 of file async.py.

The documentation for this class was generated from the following file:

- async.py (3793)

13.45 rpki.async.timer Class Reference

Inheritance diagram for rpki.async.timer:

Collaboration diagram for rpki.async.timer:

Public Member Functions

- def __cmp__
- def __del__
- def __init__
- def __repr__
- def cancel
- def clear
- def errback
- def handler
- def is_set
- def runq
- def seconds_until_wakeup
- def set
- def set_errback
- def set_handler
- def trace

Public Attributes

- errback
- handler
- when

Static Public Attributes

- gc_debug = False

  Verbose chatter about timers states and garbage collection.

- list queue = [ ]

  Timer queue, shared by all timer instances (there can be only one queue).

- run_debug = False

  Verbose chatter about timers being run.

13.45.1 Detailed Description

```
Timer construct for event-driven code.  It can be used in either of two ways:

- As a virtual class, in which case the subclass should provide a
  handler() method to receive the wakup event when the timer expires; or
```

```
- By setting an explicit handler callback, either via the
  constructor or the set_handler() method.

Subclassing is probably more Pythonic, but setting an explict
handler turns out to be very convenient when combined with bound
methods to other objects.
```

Definition at line 82 of file async.py.

13.45.2 Constructor & Destructor Documentation

13.45.2.1 def rpki.async.timer.__init__ (*self, handler* = `None`, *errback* = `None`)

Definition at line 109 of file async.py.

13.45.2.2 def rpki.async.timer.__del__ (*self*)

Definition at line 146 of file async.py.

13.45.3 Member Function Documentation

13.45.3.1 def rpki.async.timer.__cmp__ (*self, other*)

Definition at line 142 of file async.py.

13.45.3.2 def rpki.async.timer.__repr__ (*self*)

Definition at line 214 of file async.py.

13.45.3.3 def rpki.async.timer.cancel (*self*)

```
Cancel a timer, if it was set.
```

Definition at line 149 of file async.py.

13.45.3.4 def rpki.async.timer.clear (*cls*)

```
Cancel every timer on the queue.  We could just throw away the
queue content, but this way we can notify subclasses that provide
their own cancel() method.
```

Definition at line 239 of file async.py.

13.45.3.5 def rpki.async.timer.errback (*self, e*)

```
Error callback.  May be overridden, or set with set_errback().
```

Definition at line 184 of file async.py.

13.45.3.6 def rpki.async.timer.handler (*self*)

```
Handle a timer that has expired.  This must either be overriden by
a subclass or set dynamically by set_handler().
```

Definition at line 167 of file async.py.

13.45.3.7 def rpki.async.timer.is_set (*self*)

```
Test whether this timer is currently set.
```

Definition at line 161 of file async.py.

13.45.3.8 def rpki.async.timer.runq (*cls*)

```
Run the timer queue: for each timer whose call time has passed,
pull the timer off the queue and call its handler() method.
```

Definition at line 198 of file async.py.

13.45.3.9 def rpki.async.timer.seconds_until_wakeup (*cls*)

```
Calculate delay until next timer expires, or None if no timers are
set and we should wait indefinitely.  Rounds up to avoid spinning
in select() or poll().  We could calculate fractional seconds in
the right units instead, but select() and poll() don't even take
the same units (argh!), and we're not doing anything that
hair-triggered, so rounding up is simplest.
```

Definition at line 218 of file async.py.

13.45.3.10 def rpki.async.timer.set (*self, when*)

```
Set a timer.  Argument can be a datetime, to specify an absolute
time, or a timedelta, to specify an offset time.
```

Definition at line 126 of file async.py.

13.45.3.11 def rpki.async.timer.set_errback (*self, errback*)

```
Set a timer's errback.  Like set_handler(), for errbacks.
```

Definition at line 191 of file async.py.

13.45.3.12 def rpki.async.timer.set_handler (*self, handler*)

```
Set timer's expiration handler.  This is an alternative to
subclassing the timer class, and may be easier to use when
integrating timers into other classes (eg, the handler can be a
bound method to an object in a class representing a network
connection).
```

Definition at line 174 of file async.py.

13.45.3.13 def rpki.async.timer.trace (*self, msg*)

```
Debug logging.
```

Definition at line 118 of file async.py.

13.45.4 Member Data Documentation

13.45.4.1 rpki.async.timer.errback

Definition at line 193 of file async.py.

13.45.4.2 rpki::async.timer::gc_debug = False [static]

Verbose chatter about timers states and garbage collection.

Definition at line 99 of file async.py.

13.45.4.3 rpki.async.timer.handler

Definition at line 180 of file async.py.

13.45.4.4 rpki::async.timer::queue = [] [static]

Timer queue, shared by all timer instances (there can be only one queue).

Definition at line 107 of file async.py.

13.45.4.5 rpki::async.timer::run_debug = False [static]

Verbose chatter about timers being run.

Definition at line 103 of file async.py.

13.45.4.6 rpki.async.timer.when

Definition at line 109 of file async.py.

The documentation for this class was generated from the following file:

- async.py (3793)

13.46 rpki.cli.Cmd Class Reference

Inheritance diagram for rpki.cli.Cmd:

Collaboration diagram for rpki.cli.Cmd:

Public Member Functions

- def __init__

- def cmdloop_with_history
- def complete_help
- def completenames
- def do_EOF
- def do_exit
- def emptyline
- def filename_complete
- def help_help
- def onecmd

Static Public Attributes

- cmdloop_with_history = cmd.Cmd.cmdloop
- do_quit = do_exit
- emptyline_repeats_last_command = False
- EOF_exits_command_loop = True
- histfile = None
- string identchars = "/-."

13.46.1 Detailed Description

```
Customized subclass of Python cmd module.
```

Definition at line 29 of file cli.py.

13.46.2 Constructor & Destructor Documentation

13.46.2.1 def rpki.cli.Cmd.__init__ (*self*, *argv* = `None`)

Definition at line 42 of file cli.py.

13.46.3 Member Function Documentation

13.46.3.1 def rpki.cli.Cmd.cmdloop_with_history (*self*)

```
Better command loop, with history file and tweaked readline
completion delimiters.
```

Definition at line 132 of file cli.py.

13.46.3.2 def rpki.cli.Cmd.complete_help (*self, args*)

```
Better completion function for help command arguments.
```

Definition at line 119 of file cli.py.

13.46.3.3 def rpki.cli.Cmd.completenames (*self, text, ignored*)

```
Command name completion handler, with hack to restore what I
consider the normal (bash-like) behavior when one hits the
completion key and there's only one match.
```

Definition at line 101 of file cli.py.

13.46.3.4 def rpki.cli.Cmd.do_EOF (*self, arg*)

```
Exit program.
```

Definition at line 61 of file cli.py.

13.46.3.5 def rpki.cli.Cmd.do_exit (*self, arg*)

```
Exit program.
```

Definition at line 69 of file cli.py.

13.46.3.6 def rpki.cli.Cmd.emptyline (*self*)

```
Handle an empty line.  cmd module default is to repeat the last
command, which I find to be violation of the principal of least
astonishment, so my preference is that an empty line does nothing.
```

Definition at line 77 of file cli.py.

13.46.3.7 def rpki.cli.Cmd.filename_complete (*self, text, line, begidx, endidx*)

```
Filename completion handler, with hack to restore what I consider
the normal (bash-like) behavior when one hits the completion key
and there's only one match.
```

Definition at line 86 of file cli.py.

13.46.3.8 def rpki.cli.Cmd.help_help (*self*)

```
Type "help [topic]" for help on a command,
or just "help" for a list of commands.
```

Definition at line 112 of file cli.py.

13.46.3.9 def rpki.cli.Cmd.onecmd (*self, line*)

```
Wrap error handling around cmd.Cmd.onecmd().  Might want to do
something kinder than showing a traceback, eventually.
```

Definition at line 49 of file cli.py.

13.46.4 Member Data Documentation

13.46.4.1 rpki.cli.Cmd.cmdloop_with_history = cmd.Cmd.cmdloop [static]

Definition at line 153 of file cli.py.

13.46.4.2 rpki.cli.Cmd.do_quit = do_exit [static]

Definition at line 75 of file cli.py.

13.46.4.3 rpki.cli.Cmd.emptyline_repeats_last_command = False [static]

Definition at line 34 of file cli.py.

13.46.4.4 rpki.cli.Cmd.EOF_exits_command_loop = True [static]

Definition at line 36 of file cli.py.

13.46.4.5 rpki.cli.Cmd.histfile = None [static]

Reimplemented in rpki.myrpki.main.

Definition at line 40 of file cli.py.

13.46.4.6 string rpki.cli.Cmd.identchars = "/-." [static]

Definition at line 38 of file cli.py.

The documentation for this class was generated from the following file:

- cli.py (3255)

13.47 rpki.config.parser Class Reference

Inheritance diagram for rpki.config.parser:

Collaboration diagram for rpki.config.parser:

Public Member Functions

- def __init__
- def get
- def getboolean

- def getint
- def getlong
- def has_option
- def has_section
- def multiget
- def set_global_flags

Public Attributes

- cfg
- default_section
- filename

Private Member Functions

- def _repl

Static Private Attributes

- tuple _regexp = re.compile("\\${(.*?)::(.*?)}")

13.47.1 Detailed Description

```
Extensions to stock Python ConfigParser:

Read config file and set default section while initializing parser object.

Support for OpenSSL-style subscripted options and a limited form of
OpenSSL-style indirect variable references (${section::option}).

get-methods with default values and default section name.

If no filename is given to the constructor (filename = None), we
check for an environment variable naming the config file, then we
check for a default filename in the current directory, then finally
we check for a global config file if autoconf provided a directory
name to check.
```

Definition at line 55 of file config.py.

13.47.2 Constructor & Destructor Documentation

13.47.2.1 def rpki.config.parser.__init__ (*self*, *filename* = `None`, *section* = `None`, *allow_missing* = `False`)

Definition at line 73 of file config.py.

13.47.3 Member Function Documentation

13.47.3.1 def rpki.config.parser._repl (*self, m*) [private]

```
Replacement function for indirect variable substitution.
This is intended for use with re.subn().
```

Definition at line 140 of file config.py.

13.47.3.2 def rpki.config.parser.get (*self, option, default* = **None**, *section* = **None**)

```
Get an option, perhaps with a default value.
```

Definition at line 151 of file config.py.

13.47.3.3 def rpki.config.parser.getboolean (*self, option, default* = **None**, *section* = **None**)

```
Get a boolean option, perhaps with a default value.
```

Definition at line 165 of file config.py.

13.47.3.4 def rpki.config.parser.getint (*self, option, default* = **None**, *section* = **None**)

```
Get an integer option, perhaps with a default value.
```

Definition at line 177 of file config.py.

13.47.3.5 def rpki.config.parser.getlong (*self, option, default* = **None**, *section* = **None**)

```
Get a long integer option, perhaps with a default value.
```

Definition at line 183 of file config.py.

13.47.3.6 def rpki.config.parser.has_option (*self, option, section* = `None`)

```
Test whether an option exists.
```

Definition at line 110 of file config.py.

13.47.3.7 def rpki.config.parser.has_section (*self, section*)

```
Test whether a section exists.
```

Definition at line 103 of file config.py.

13.47.3.8 def rpki.config.parser.multiget (*self, option, section* = `None`)

```
Parse OpenSSL-style foo.0, foo.1, ... subscripted options.

Returns a list of values matching the specified option name.
```

Definition at line 119 of file config.py.

13.47.3.9 def rpki.config.parser.set_global_flags (*self*)

```
Consolidated control for all the little global control flags
scattered through the libraries.  This isn't a particularly good
place for this function to live, but it has to live somewhere and
making it a method of the config parser from which it gets all of
its data is less silly than the available alternatives.
```

Definition at line 189 of file config.py.

13.47.4 Member Data Documentation

13.47.4.1 tuple rpki.config.parser._regexp = re.compile("\\${(.*?)::(.*?)}") [static, private]

Definition at line 138 of file config.py.

13.47.4.2 rpki.config.parser.cfg

Definition at line 73 of file config.py.

13.47.4.3 rpki.config.parser.default_section

Definition at line 73 of file config.py.

13.47.4.4 rpki.config.parser.filename

Definition at line 73 of file config.py.

The documentation for this class was generated from the following file:

- config.py (3620)

13.48 rpki.exceptions.BadClassNameSyntax Class Reference

Inheritance diagram for rpki.exceptions.BadClassNameSyntax:

Collaboration diagram for rpki.exceptions.BadClassNameSyntax:

13.48.1 Detailed Description

```
Illegal syntax for a class_name.
```

Definition at line 92 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.49 rpki.exceptions.BadClientURL Class Reference

Inheritance diagram for rpki.exceptions.BadClientURL:

Collaboration diagram for rpki.exceptions.BadClientURL:

13.49.1 Detailed Description

```
URL given to HTTP client does not match profile.
```

Definition at line 232 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.50 rpki.exceptions.BadContactURL Class Reference

Inheritance diagram for rpki.exceptions.BadContactURL:

Collaboration diagram for rpki.exceptions.BadContactURL:

13.50.1 Detailed Description

```
Error trying to parse contact URL.
```

Definition at line 87 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.51 rpki.exceptions.BadExtension Class Reference

Inheritance diagram for rpki.exceptions.BadExtension:

Collaboration diagram for rpki.exceptions.BadExtension:

13.51.1 Detailed Description

```
Forbidden X.509 extension.
```

Definition at line 242 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.52 rpki.exceptions.BadIPResource Class Reference

Inheritance diagram for rpki.exceptions.BadIPResource:

Collaboration diagram for rpki.exceptions.BadIPResource:

13.52.1 Detailed Description

```
Parse failure for alleged IP resource string.
```

Definition at line 315 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.53 rpki.exceptions.BadIRDBReply Class Reference

Inheritance diagram for rpki.exceptions.BadIRDBReply:

Collaboration diagram for rpki.exceptions.BadIRDBReply:

13.53.1 Detailed Description

```
Unexpected reply to IRDB query.
```

Definition at line 152 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.54 rpki.exceptions.BadIssueResponse Class Reference

Inheritance diagram for rpki.exceptions.BadIssueResponse:

Collaboration diagram for rpki.exceptions.BadIssueResponse:

13.54.1 Detailed Description

```
issue_response PDU with wrong number of classes or certificates.
```

Definition at line 97 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.55 rpki.exceptions.BadPKCS10 Class Reference

Inheritance diagram for rpki.exceptions.BadPKCS10:

Collaboration diagram for rpki.exceptions.BadPKCS10:

13.55.1 Detailed Description

```
Bad PKCS #10 object.
```

Definition at line 107 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.56 rpki.exceptions.BadPublicationReply Class Reference

Inheritance diagram for rpki.exceptions.BadPublicationReply:

Collaboration diagram for rpki.exceptions.BadPublicationReply:

13.56.1 Detailed Description

```
Unexpected reply to publication query.
```

Definition at line 257 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.57 rpki.exceptions.BadQuery Class Reference

Inheritance diagram for rpki.exceptions.BadQuery:

Collaboration diagram for rpki.exceptions.BadQuery:

13.57.1 Detailed Description

```
Unexpected protocol query.
```

Definition at line 55 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.58 rpki.exceptions.BadROAPrefix Class Reference

Inheritance diagram for rpki.exceptions.BadROAPrefix:

Collaboration diagram for rpki.exceptions.BadROAPrefix:

13.58.1 Detailed Description

```
Parse failure for alleged ROA prefix string.
```

Definition at line 320 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.59 rpki.exceptions.BadSender Class Reference

Inheritance diagram for rpki.exceptions.BadSender:

Collaboration diagram for rpki.exceptions.BadSender:

13.59.1 Detailed Description

```
Unexpected XML sender value.
```

Definition at line 127 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.60 rpki.exceptions.BadStatusCode Class Reference

Inheritance diagram for rpki.exceptions.BadStatusCode:

Collaboration diagram for rpki.exceptions.BadStatusCode:

13.60.1 Detailed Description

```
Unrecognized protocol status code.
```

Definition at line 50 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.61 rpki.exceptions.BadURISyntax Class Reference

Inheritance diagram for rpki.exceptions.BadURISyntax:

Collaboration diagram for rpki.exceptions.BadURISyntax:

13.61.1 Detailed Description

```
Illegal syntax for a URI.
```

Definition at line 45 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.62 rpki.exceptions.BSCNotFound Class Reference

Inheritance diagram for rpki.exceptions.BSCNotFound:

Collaboration diagram for rpki.exceptions.BSCNotFound:

13.62.1 Detailed Description

```
Could not find specified BSC in database.
```

Definition at line 122 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.63 rpki.exceptions.BSCNotReady Class Reference

Inheritance diagram for rpki.exceptions.BSCNotReady:

Collaboration diagram for rpki.exceptions.BSCNotReady:

13.63.1 Detailed Description

```
BSC not yet in a usable state, signing_cert not set.
```

Definition at line 277 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.64 rpki.exceptions.ChildNotFound Class Reference

Inheritance diagram for rpki.exceptions.ChildNotFound:

Collaboration diagram for rpki.exceptions.ChildNotFound:

13.64.1 Detailed Description

```
Could not find specified child in database.
```

Definition at line 117 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.65 rpki.exceptions.ClassNameMismatch Class Reference

Inheritance diagram for rpki.exceptions.ClassNameMismatch:

Collaboration diagram for rpki.exceptions.ClassNameMismatch:

13.65.1 Detailed Description

```
class_name does not match child context.
```

Definition at line 132 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.66 rpki.exceptions.ClassNameUnknown Class Reference

Inheritance diagram for rpki.exceptions.ClassNameUnknown:

Collaboration diagram for rpki.exceptions.ClassNameUnknown:

13.66.1 Detailed Description

```
Unknown class_name.
```

Definition at line 137 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.67 rpki.exceptions.ClientNotFound Class Reference

Inheritance diagram for rpki.exceptions.ClientNotFound:

Collaboration diagram for rpki.exceptions.ClientNotFound:

13.67.1 Detailed Description

```
Could not find specified client in database.
```

Definition at line 237 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.68 rpki.exceptions.CMSContentNotSet Class Reference

Inheritance diagram for rpki.exceptions.CMSContentNotSet:

Collaboration diagram for rpki.exceptions.CMSContentNotSet:

13.68.1 Detailed Description

```
Inner content of a CMS_object has not been set.  If object is known
to be valid, the .extract() method should be able to set the
content; otherwise, only the .verify() method (which checks
signatures) is safe.
```

Definition at line 302 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.69 rpki.exceptions.CMSCRLNotSet Class Reference

Inheritance diagram for rpki.exceptions.CMSCRLNotSet:

Collaboration diagram for rpki.exceptions.CMSCRLNotSet:

13.69.1 Detailed Description

```
CMS CRL has not been configured.
```

Definition at line 217 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.70 rpki.exceptions.CMSVerificationFailed Class Reference

Inheritance diagram for rpki.exceptions.CMSVerificationFailed:

Collaboration diagram for rpki.exceptions.CMSVerificationFailed:

13.70.1 Detailed Description

```
Verification of a CMS message failed.
```

Definition at line 66 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.71 rpki.exceptions.CommandParseFailure Class Reference

Inheritance diagram for rpki.exceptions.CommandParseFailure:

Collaboration diagram for rpki.exceptions.CommandParseFailure:

13.71.1 Detailed Description

```
Failed to parse command line.
```

Definition at line 325 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.72 rpki.exceptions.DBConsistancyError Class Reference

Inheritance diagram for rpki.exceptions.DBConsistancyError:

Collaboration diagram for rpki.exceptions.DBConsistancyError:

13.72.1 Detailed Description

```
Found multiple matches for a database query that shouldn't ever
return that.
```

Definition at line 60 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.73 rpki.exceptions.DERObjectConversionError Class Reference

Inheritance diagram for rpki.exceptions.DERObjectConversionError:

Collaboration diagram for rpki.exceptions.DERObjectConversionError:

13.73.1 Detailed Description

```
Error trying to convert a DER-based object from one representation
to another.
```

Definition at line 76 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.74 rpki.exceptions.DuplicateObject Class Reference

Inheritance diagram for rpki.exceptions.DuplicateObject:

Collaboration diagram for rpki.exceptions.DuplicateObject:

13.74.1 Detailed Description

```
Attempt to create an object that already exists.
```

Definition at line 262 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.75 rpki.exceptions.EmptyPEM Class Reference

Inheritance diagram for rpki.exceptions.EmptyPEM:

Collaboration diagram for rpki.exceptions.EmptyPEM:

13.75.1 Detailed Description

```
Couldn't find PEM block to convert.
```

Definition at line 187 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.76 rpki.exceptions.EmptyROAPrefixList Class Reference

Inheritance diagram for rpki.exceptions.EmptyROAPrefixList:

Collaboration diagram for rpki.exceptions.EmptyROAPrefixList:

13.76.1 Detailed Description

```
Can't create ROA with an empty prefix list.
```

Definition at line 267 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.77 rpki.exceptions.ForbiddenURI Class Reference

Inheritance diagram for rpki.exceptions.ForbiddenURI:

Collaboration diagram for rpki.exceptions.ForbiddenURI:

13.77.1 Detailed Description

```
Forbidden URI, does not start with correct base URI.
```

Definition at line 247 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.78 rpki.exceptions.HandleTranslationError Class Reference

Inheritance diagram for rpki.exceptions.HandleTranslationError:

Collaboration diagram for rpki.exceptions.HandleTranslationError:

13.78.1 Detailed Description

```
Internal error translating protocol handle -> SQL id.
```

Definition at line 292 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.79 rpki.exceptions.HTTPBadVersion Class Reference

Inheritance diagram for rpki.exceptions.HTTPBadVersion:

Collaboration diagram for rpki.exceptions.HTTPBadVersion:

13.79.1 Detailed Description

```
HTTP couldn't parse HTTP version.
```

Definition at line 287 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.80 rpki.exceptions.HTTPClientAborted Class Reference

Inheritance diagram for rpki.exceptions.HTTPClientAborted:

Collaboration diagram for rpki.exceptions.HTTPClientAborted:

13.80.1 Detailed Description

```
HTTP client connection closed while in request-sent state.
```

Definition at line 252 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.81 rpki.exceptions.HTTPRequestFailed Class Reference

Inheritance diagram for rpki.exceptions.HTTPRequestFailed:

Collaboration diagram for rpki.exceptions.HTTPRequestFailed:

13.81.1 Detailed Description

```
HTTP request failed.
```

Definition at line 71 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.82 rpki.exceptions.HTTPTimeout Class Reference

Inheritance diagram for rpki.exceptions.HTTPTimeout:

Collaboration diagram for rpki.exceptions.HTTPTimeout:

13.82.1 Detailed Description

```
HTTP connection timed out.
```

Definition at line 310 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.83 rpki.exceptions.HTTPUnexpectedState Class Reference

Inheritance diagram for rpki.exceptions.HTTPUnexpectedState:

Collaboration diagram for rpki.exceptions.HTTPUnexpectedState:

13.83.1 Detailed Description

```
HTTP event occurred in an unexpected state.
```

Definition at line 282 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.84 rpki.exceptions.MissingCMSCRL Class Reference

Inheritance diagram for rpki.exceptions.MissingCMSCRL:

Collaboration diagram for rpki.exceptions.MissingCMSCRL:

13.84.1 Detailed Description

```
Didn't receive CMS CRL when expecting one.
```

Definition at line 207 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.85 rpki.exceptions.MissingCMSEEcert Class Reference

Inheritance diagram for rpki.exceptions.MissingCMSEEcert:

Collaboration diagram for rpki.exceptions.MissingCMSEEcert:

13.85.1 Detailed Description

```
Didn't receive CMS EE cert when expecting one.
```

Definition at line 202 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.86 rpki.exceptions.MultipleTLSEECert Class Reference

Inheritance diagram for rpki.exceptions.MultipleTLSEECert:

Collaboration diagram for rpki.exceptions.MultipleTLSEECert:

13.86.1 Detailed Description

```
Received more than one TLS EE certificate.
```

Definition at line 172 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.87 rpki.exceptions.MustBePrefix Class Reference

Inheritance diagram for rpki.exceptions.MustBePrefix:

Collaboration diagram for rpki.exceptions.MustBePrefix:

13.87.1 Detailed Description

```
Resource range cannot be expressed as a prefix.
```

Definition at line 162 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.88 rpki.exceptions.NoActiveCA Class Reference

Inheritance diagram for rpki.exceptions.NoActiveCA:

Collaboration diagram for rpki.exceptions.NoActiveCA:

13.88.1 Detailed Description

```
No active ca_detail for specified class.
```

Definition at line 227 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.89 rpki.exceptions.NoCoveringCertForROA Class Reference

Inheritance diagram for rpki.exceptions.NoCoveringCertForROA:

Collaboration diagram for rpki.exceptions.NoCoveringCertForROA:

13.89.1 Detailed Description

```
Couldn't find a covering certificate to generate ROA.
```

Definition at line 272 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.90 rpki.exceptions.NoObjectAtURI Class Reference

Inheritance diagram for rpki.exceptions.NoObjectAtURI:

Collaboration diagram for rpki.exceptions.NoObjectAtURI:

13.90.1 Detailed Description

```
No object published at specified URI.
```

Definition at line 297 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.91 rpki.exceptions.NotACertificateChain Class Reference

Inheritance diagram for rpki.exceptions.NotACertificateChain:

Collaboration diagram for rpki.exceptions.NotACertificateChain:

13.91.1 Detailed Description

```
Certificates don't form a proper chain.
```

Definition at line 82 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.92 rpki.exceptions.NotFound Class Reference

Inheritance diagram for rpki.exceptions.NotFound:

Collaboration diagram for rpki.exceptions.NotFound:

13.92.1 Detailed Description

```
Object not found in database.
```

Definition at line 157 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.93 rpki.exceptions.NotImplementedYet Class Reference

Inheritance diagram for rpki.exceptions.NotImplementedYet:

Collaboration diagram for rpki.exceptions.NotImplementedYet:

13.93.1 Detailed Description

```
Internal error -- not implemented yet.
```

Definition at line 102 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.94 rpki.exceptions.NotInDatabase Class Reference

Inheritance diagram for rpki.exceptions.NotInDatabase:

Collaboration diagram for rpki.exceptions.NotInDatabase:

13.94.1 Detailed Description

```
Lookup failed for an object expected to be in the database.
```

Definition at line 40 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.95 rpki.exceptions.ReceivedTLSCACert Class Reference

Inheritance diagram for rpki.exceptions.ReceivedTLSCACert:

Collaboration diagram for rpki.exceptions.ReceivedTLSCACert:

13.95.1 Detailed Description

Received CA certificate via TLS.

Definition at line 177 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.96 rpki.exceptions.RPKI_Exception Class Reference

Inherits Exception.

Inherited by rpki.exceptions.BadClassNameSyntax, rpki.exceptions.BadClientURL, rpki.exceptions.BadContactURL, rpki.exceptions.BadExtension, rpki.exceptions.BadIPResource, rpki.exceptions.BadIRDBReply, rpki.exceptions.BadIssueResponse, rpki.exceptions.BadPKCS10, rpki.exceptions.BadPublicationReply, rpki.exceptions.BadQuery, rpki.exceptions.BadROAPrefix, rpki.exceptions.BadSender, rpki.exceptions.BadStatusCode, rpki.exceptions.BadURISyntax, rpki.exceptions.BSCNotFound, rpki.exceptions.BSCNotReady, rpki.exceptions.ChildNotFound, rpki.exceptions.ClassNameMismatch, rpki.exceptions.ClassNameUnknown, rpki.exceptions.ClientNotFound, rpki.exceptions.CMSContentNotSet, rpki.exceptions.CMSCRLNotSet, rpki.exceptions.CMSVerificationFailed, rpki.exceptions.CommandParseFailure, rpki.exceptions.DBConsistancyError, rpki.exceptions.DERObjectConversionError, rpki.exceptions.DuplicateObject, rpki.exceptions.EmptyPEM, rpki.exceptions.EmptyROAPrefixList, rpki.exceptions.ForbiddenURI, rpki.exceptions.HandleTranslationError, rpki.exceptions.HTTPBadVersion, rpki.exceptions.HTTPClientAborted, rpki.exceptions.HTTPRequestFailed, rpki.exceptions.HTTPTimeout, rpki.exceptions.HTTPUnexpectedState, rpki.exceptions.MissingCMSCRL, rpki.exceptions.MissingCMSEEcert, rpki.exceptions.MustBePrefix, rpki.exceptions.NoActiveCA, rpki.exceptions.NoCoveringCertForROA, rpki.exceptions.NoObjectAtURI, rpki.exceptions.NotACertificateChain, rpki.exceptions.NotFound, rpki.exceptions.NotImplementedYet, rpki.exceptions.NotInDatabase, rpki.exceptions.ServerShuttingDown, rpki.exceptions.SKIMismatch, rpki.exceptions.SubprocessError, rpki.exceptions.TLSValidationError, rpki.exceptions.UnexpectedCMSCerts, rpki.exceptions.UnexpectedCMSCRLs, rpki.exceptions.UnparsableCMSDER, rpki.exceptions.UpstreamError, rpki.exceptions.WrongEContentType, rpki.rcynic.NotRsyncURI, and rpki.rcynic.UnknownObject.

Collaboration diagram for rpki.exceptions.RPKI_Exception:

13.96.1 Detailed Description

```
Base class for RPKI exceptions.
```

Definition at line 35 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.97 rpki.exceptions.ServerShuttingDown Class Reference

Inheritance diagram for rpki.exceptions.ServerShuttingDown:

Collaboration diagram for rpki.exceptions.ServerShuttingDown:

13.97.1 Detailed Description

```
Server is shutting down.
```

Definition at line 222 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.98 rpki.exceptions.SKIMismatch Class Reference

Inheritance diagram for rpki.exceptions.SKIMismatch:

Collaboration diagram for rpki.exceptions.SKIMismatch:

13.98.1 Detailed Description

```
SKI value in response does not match request.
```

Definition at line 142 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.99 rpki.exceptions.SubprocessError Class Reference

Inheritance diagram for rpki.exceptions.SubprocessError:

Collaboration diagram for rpki.exceptions.SubprocessError:

13.99.1 Detailed Description

```
Subprocess returned unexpected error.
```

Definition at line 147 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.100 rpki.exceptions.TLSValidationError Class Reference

Inheritance diagram for rpki.exceptions.TLSValidationError:

Collaboration diagram for rpki.exceptions.TLSValidationError:

13.100.1 Detailed Description

```
TLS certificate validation error.
```

Definition at line 167 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.101 rpki.exceptions.UnexpectedCMSCerts Class Reference

Inheritance diagram for rpki.exceptions.UnexpectedCMSCerts:

Collaboration diagram for rpki.exceptions.UnexpectedCMSCerts:

13.101.1 Detailed Description

```
Received CMS certs when not expecting any.
```

Definition at line 192 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.102 rpki.exceptions.UnexpectedCMSCRLs Class Reference

Inheritance diagram for rpki.exceptions.UnexpectedCMSCRLs:

Collaboration diagram for rpki.exceptions.UnexpectedCMSCRLs:

13.102.1 Detailed Description

```
Received CMS CRLs when not expecting any.
```

Definition at line 197 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.103 rpki.exceptions.UnparsableCMSDER Class Reference

Inheritance diagram for rpki.exceptions.UnparsableCMSDER:

Collaboration diagram for rpki.exceptions.UnparsableCMSDER:

13.103.1 Detailed Description

```
Alleged CMS DER wasn't parsable.
```

Definition at line 212 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.104 rpki.exceptions.UpstreamError Class Reference

Inheritance diagram for rpki.exceptions.UpstreamError:

Collaboration diagram for rpki.exceptions.UpstreamError:

13.104.1 Detailed Description

```
Received an error from upstream.
```

Definition at line 112 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.105 rpki.exceptions.WrongEContentType Class Reference

Inheritance diagram for rpki.exceptions.WrongEContentType:

Collaboration diagram for rpki.exceptions.WrongEContentType:

13.105.1 Detailed Description

```
Received wrong CMS eContentType.
```

Definition at line 182 of file exceptions.py.

The documentation for this class was generated from the following file:

- exceptions.py (3465)

13.106 rpki.ghostbuster.Ghostbuster Class Reference

Inheritance diagram for rpki.ghostbuster.Ghostbuster:

Collaboration diagram for rpki.ghostbuster.Ghostbuster:

13.106.1 Detailed Description

Definition at line 25 of file ghostbuster.py.

The documentation for this class was generated from the following file:

- ghostbuster.py (3860)

13.107 rpki.http.caller Class Reference

Inheritance diagram for rpki.http.caller:

Collaboration diagram for rpki.http.caller:

Public Member Functions

- def __call__
- def __init__

Public Attributes

- client_cert
- client_key
- proto
- server_cert

- server_ta
- url

Static Public Attributes

- debug = False

13.107.1 Detailed Description

```
Handle client-side mechanics for protocols based on HTTP, CMS, and
rpki.xml_utils.  Calling sequence is intended to nest within
rpki.async.sync_wrapper.
```

Definition at line 1003 of file http.py.

13.107.2 Constructor & Destructor Documentation

13.107.2.1 def rpki.http.caller.__init__ (*self, proto, client_key, client_cert, server_ta, server_cert, url, debug* = `None`)

Definition at line 1012 of file http.py.

13.107.3 Member Function Documentation

13.107.3.1 def rpki.http.caller.__call__ (*self, cb, eb, pdus*)

Definition at line 1022 of file http.py.

13.107.4 Member Data Documentation

13.107.4.1 rpki.http.caller.client_cert

Definition at line 1012 of file http.py.

13.107.4.2 rpki.http.caller.client_key

Definition at line 1012 of file http.py.

13.107.4.3 rpki.http.caller.debug = False [static]

Definition at line 1010 of file http.py.

13.107.4.4 rpki.http.caller.proto

Definition at line 1012 of file http.py.

13.107.4.5 rpki.http.caller.server_cert

Definition at line 1012 of file http.py.

13.107.4.6 rpki.http.caller.server_ta

Definition at line 1012 of file http.py.

13.107.4.7 rpki.http.caller.url

Definition at line 1012 of file http.py.

The documentation for this class was generated from the following file:

- http.py (3793)

13.108 rpki.http.http_client Class Reference

Inheritance diagram for rpki.http.http_client:

Collaboration diagram for rpki.http.http_client:

Public Member Functions

- def __init__
- def dns_error
- def gotaddrinfo
- def handle_close
- def handle_connect
- def handle_error
- def handle_message
- def handle_no_content_length
- def handle_timeout
- def send_request
- def set_state
- def start

Public Attributes

- addr
- address
- expect_close
- host
- port
- queue

Static Public Attributes

- parse_type = http_response

  Stream parser should look for incoming HTTP response messages.

- state = None

  Application layer connection state.

- timeout = default_client_timeout

  Use the default client timeout value set in the module header.

13.108.1 Detailed Description

```
HTTP client stream.
```

Definition at line 642 of file http.py.

13.108.2 Constructor & Destructor Documentation

13.108.2.1 def rpki.http.http_client.__init__ (*self, queue, hostport*)

Definition at line 659 of file http.py.

13.108.3 Member Function Documentation

13.108.3.1 def rpki.http.http_client.dns_error (*self, e*)

```
Handle DNS lookup errors.  For now, just whack the connection.
Undoubtedly we should do something better with diagnostics here.
```

Definition at line 684 of file http.py.

13.108.3.2 def rpki.http.http_client.gotaddrinfo (*self, addrinfo*)

```
Got address data from DNS, create socket and request connection.
```

Definition at line 691 of file http.py.

13.108.3.3 def rpki.http.http_client.handle_close (*self*)

```
Asyncore signaled connection close.  If we were waiting for that
to find the end of a response message, process the resulting
message now; if we were waiting for the response to a request we
sent, signal the error.
```

Reimplemented from rpki.http.http_stream.

Definition at line 778 of file http.py.

13.108.3.4 def rpki.http.http_client.handle_connect (*self*)

```
Asyncore says socket has connected.
```

Definition at line 707 of file http.py.

13.108.3.5 def rpki.http.http_client.handle_error (*self*)

```
Asyncore says something threw an exception.  Log it, then shut
down the connection and pass back the exception.
```

Reimplemented from rpki.http.http_stream.

Definition at line 808 of file http.py.

13.108.3.6 def rpki.http.http_client.handle_message (*self*)

```
Handle incoming HTTP response message.  Make sure we're in a state
where we expect to see such a message (and allow the mysterious
empty messages that Apache sends during connection close, no idea
what that is supposed to be about).  If everybody agrees that the
connection should stay open, put it into an idle state; otherwise,
arrange for the stream to shut down.
```

Definition at line 743 of file http.py.

13.108.3.7 def rpki.http.http_client.handle_no_content_length (*self*)

```
Handle response message that used neither chunking nor a
Content-Length header (that is: this message will be the last one
in this server stream).  In this case we want to read until we
reach the end of the data stream.
```

Definition at line 723 of file http.py.

13.108.3.8 def rpki.http.http_client.handle_timeout (*self*)

```
Connection idle timer has expired.  Shut down connection in any
case, noisily if we weren't idle.
```

Reimplemented from rpki.http.http_stream.

Definition at line 794 of file http.py.

13.108.3.9 def rpki.http.http_client.send_request (*self, msg*)

```
Queue up request message and kickstart connection.
```

Definition at line 732 of file http.py.

13.108.3.10 def rpki.http.http_client.set_state (*self, state*)

```
Set HTTP client connection state.
```

Definition at line 716 of file http.py.

13.108.3.11 def rpki.http.http_client.start (*self*)

```
Create socket and request a connection.
```

Definition at line 668 of file http.py.

13.108.4 Member Data Documentation

13.108.4.1 rpki.http.http_client.addr

Definition at line 693 of file http.py.

13.108.4.2 rpki.http.http_client.address

Definition at line 693 of file http.py.

13.108.4.3 rpki.http.http_client.expect_close

Definition at line 659 of file http.py.

13.108.4.4 rpki.http.http_client.host

Definition at line 659 of file http.py.

13.108.4.5 rpki::http.http_client::parse_type = http_response [static]

Stream parser should look for incoming HTTP response messages.

Definition at line 649 of file http.py.

13.108.4.6 rpki.http.http_client.port

Definition at line 659 of file http.py.

13.108.4.7 rpki.http.http_client.queue

Definition at line 659 of file http.py.

13.108.4.8 rpki::http.http_client::state = None [static]

Application layer connection state.

Definition at line 657 of file http.py.

13.108.4.9 rpki::http.http_client::timeout = default_client_timeout [static]

Use the default client timeout value set in the module header.

Definition at line 653 of file http.py.

The documentation for this class was generated from the following file:

- http.py (3793)

13.109 rpki.http.http_listener Class Reference

Inheritance diagram for rpki.http.http_listener:

Collaboration diagram for rpki.http.http_listener:

Public Member Functions

- def __init__
- def __repr__
- def handle_accept
- def handle_error

Public Attributes

- handlers

Static Public Attributes

- log = log_method
- show_tracebacks = False

13.109.1 Detailed Description

```
Listener for incoming HTTP connections.
```

Definition at line 579 of file http.py.

13.109.2 Constructor & Destructor Documentation

13.109.2.1 def rpki.http.http_listener.__init__ (*self, handlers, addrinfo*)

Definition at line 594 of file http.py.

13.109.3 Member Function Documentation

13.109.3.1 def rpki.http.http_listener.__repr__ (*self*)

Definition at line 587 of file http.py.

13.109.3.2 def rpki.http.http_listener.handle_accept (*self*)

```
Asyncore says we have an incoming connection, spawn an http_server
stream for it and pass along all of our handler data.
```

Definition at line 617 of file http.py.

13.109.3.3 def rpki.http.http_listener.handle_error (*self*)

```
Asyncore signaled an error, pass it along or log it.
```

Definition at line 632 of file http.py.

13.109.4 Member Data Documentation

13.109.4.1 rpki.http.http_listener.handlers

Definition at line 594 of file http.py.

13.109.4.2 rpki.http.http_listener.log = log_method [static]

Definition at line 584 of file http.py.

13.109.4.3 rpki.http.http_listener.show_tracebacks = False [static]

Definition at line 585 of file http.py.

The documentation for this class was generated from the following file:

- http.py (3793)

13.110 rpki.http.http_message Class Reference

Inheritance diagram for rpki.http.http_message:

Collaboration diagram for rpki.http.http_message:

Public Member Functions

- def __init__
- def __str__
- def format
- def normalize_headers
- def parse_from_wire
- def parse_version

- def persistent

Public Attributes

- body
- headers
- version

Static Public Attributes

- string software_name = "ISC RPKI library"

13.110.1 Detailed Description

```
Virtual class representing of one HTTP message.
```

Definition at line 125 of file http.py.

13.110.2 Constructor & Destructor Documentation

13.110.2.1 def rpki.http.http_message.__init__ (*self*, *version* = `None`, *body* = `None`, *headers* = `None`)

Definition at line 132 of file http.py.

13.110.3 Member Function Documentation

13.110.3.1 def rpki.http.http_message.__str__ (*self*)

Definition at line 190 of file http.py.

13.110.3.2 def rpki.http.http_message.format (*self*)

```
Format an outgoing HTTP message.
```

Definition at line 175 of file http.py.

13.110.3.3 def rpki.http.http_message.normalize_headers (*self, headers = None*)

```
Clean up (some of) the horrible messes that HTTP allows in its
headers.
```

Definition at line 138 of file http.py.

13.110.3.4 def rpki.http.http_message.parse_from_wire (*cls, headers*)

```
Parse and normalize an incoming HTTP message.
```

Definition at line 161 of file http.py.

13.110.3.5 def rpki.http.http_message.parse_version (*self, version*)

```
Parse HTTP version, raise an exception if we can't.
```

Definition at line 193 of file http.py.

13.110.3.6 def rpki.http.http_message.persistent (*self*)

```
Figure out whether this HTTP message encourages a persistent connection.
```

Definition at line 202 of file http.py.

13.110.4 Member Data Documentation

13.110.4.1 rpki.http.http_message.body

Definition at line 132 of file http.py.

13.110.4.2 rpki.http.http_message.headers

Definition at line 132 of file http.py.

13.110.4.3 string rpki.http.http_message.software_name = "ISC RPKI library" [static]

Definition at line 130 of file http.py.

13.110.4.4 rpki.http.http_message.version

Definition at line 132 of file http.py.

The documentation for this class was generated from the following file:

- http.py (3793)

13.111 rpki.http.http_queue Class Reference

Inheritance diagram for rpki.http.http_queue:

Collaboration diagram for rpki.http.http_queue:

Public Member Functions

- def __init__
- def __repr__
- def detach
- def request
- def restart
- def return_result
- def send_request

Public Attributes

- client
- hostport
- queue

Static Public Attributes

- log = log_method

13.111.1 Detailed Description

```
Queue of pending HTTP requests for a single destination.  This class
is very tightly coupled to http_client; http_client handles the HTTP
stream itself, this class provides a slightly higher-level API.
```

Definition at line 818 of file http.py.

13.111.2 Constructor & Destructor Documentation

13.111.2.1 def rpki.http.http_queue.__init__ (*self, hostport*)

Definition at line 830 of file http.py.

13.111.3 Member Function Documentation

13.111.3.1 def rpki.http.http_queue.__repr__ (*self*)

Definition at line 827 of file http.py.

13.111.3.2 def rpki.http.http_queue.detach (*self, client_*)

```
Detatch a client from this queue.  Silently ignores attempting to
detach a client that is not attached to this queue, to simplify
handling of what otherwise would be a nasty set of race
conditions.
```

Definition at line 874 of file http.py.

13.111.3.3 def rpki.http.http_queue.request (*self, requests*)

```
Append http_request object(s) to this queue.
```

Definition at line 836 of file http.py.

13.111.3.4 def rpki.http.http_queue.restart (*self*)

```
Send next request for this queue, if we can.  This may involve
starting a new http_client stream, reusing an existing idle
stream, or just ignoring this request if there's an active client
stream already; in the last case, handling of the response (or
exception, or timeout) for the query currently in progress will
call this method when it's time to kick out the next query.
```

Definition at line 843 of file http.py.

13.111.3.5 def rpki.http.http_queue.return_result (*self, client, result, detach* = **False**)

```
Client stream has returned a result, which we need to pass along
to the original caller.  Result may be either an HTTP response
message or an exception.  In either case, once we're done
processing this result, kick off next message in the queue, if any.
```

Definition at line 885 of file http.py.

13.111.3.6 def rpki.http.http_queue.send_request (*self*)

```
Kick out the next query in this queue, if any.
```

Definition at line 867 of file http.py.

13.111.4 Member Data Documentation

13.111.4.1 rpki.http.http_queue.client

Definition at line 830 of file http.py.

13.111.4.2 rpki.http.http_queue.hostport

Definition at line 830 of file http.py.

13.111.4.3 rpki.http.http_queue.log = log_method [static]

Definition at line 825 of file http.py.

13.111.4.4 rpki.http.http_queue.queue

Definition at line 830 of file http.py.

The documentation for this class was generated from the following file:

- http.py (3793)

13.112 rpki.http.http_request Class Reference

Inheritance diagram for rpki.http.http_request:

Collaboration diagram for rpki.http.http_request:

Public Member Functions

- def __init__
- def __repr__
- def format_first_line
- def parse_first_line

Public Attributes

- callback
- cmd
- errback
- path
- retried

13.112.1 Detailed Description

```
HTTP request message.
```

Definition at line 214 of file http.py.

13.112.2 Constructor & Destructor Documentation

13.112.2.1 def rpki.http.http_request.__init__ (*self*, *cmd* = `None`, *path* = `None`, *version* = default_http_version, *body* = `None`, *callback* = `None`, *errback* = `None`, *headers*)

Definition at line 219 of file http.py.

13.112.3 Member Function Documentation

13.112.3.1 def rpki.http.http_request.__repr__ (*self*)

Definition at line 244 of file http.py.

13.112.3.2 def rpki.http.http_request.format_first_line (*self*)

```
Format first line of HTTP request message, and set up the
User-Agent header.
```

Definition at line 236 of file http.py.

13.112.3.3 def rpki.http.http_request.parse_first_line (*self, cmd, path, version*)

```
Parse first line of HTTP request message.
```

Definition at line 228 of file http.py.

13.112.4 Member Data Documentation

13.112.4.1 rpki.http.http_request.callback

Definition at line 219 of file http.py.

13.112.4.2 rpki.http.http_request.cmd

Definition at line 219 of file http.py.

13.112.4.3 rpki.http.http_request.errback

Definition at line 219 of file http.py.

13.112.4.4 rpki.http.http_request.path

Definition at line 219 of file http.py.

13.112.4.5 rpki.http.http_request.retried

Definition at line 219 of file http.py.

The documentation for this class was generated from the following file:

- http.py (3793)

13.113 rpki.http.http_response Class Reference

Inheritance diagram for rpki.http.http_response:

Collaboration diagram for rpki.http.http_response:

Public Member Functions

- def __init__
- def __repr__
- def format_first_line
- def parse_first_line

Public Attributes

- code
- reason

13.113.1 Detailed Description

```
HTTP response message.
```

Definition at line 247 of file http.py.

13.113.2 Constructor & Destructor Documentation

13.113.2.1 def rpki.http.http_response.__init__ (*self*, *code* = `None`, *reason* = `None`, *version* = default_http_version, *body* = `None`, *headers*)

Definition at line 252 of file http.py.

13.113.3 Member Function Documentation

13.113.3.1 def rpki.http.http_response.__repr__ (*self*)

Definition at line 274 of file http.py.

13.113.3.2 def rpki.http.http_response.format_first_line (*self*)

```
Format first line of HTTP response message, and set up Date and
Server headers.
```

Definition at line 265 of file http.py.

13.113.3.3 def rpki.http.http_response.parse_first_line (*self, version, code, reason*)

```
Parse first line of HTTP response message.
```

Definition at line 257 of file http.py.

13.113.4 Member Data Documentation

13.113.4.1 rpki.http.http_response.code

Definition at line 252 of file http.py.

13.113.4.2 rpki.http.http_response.reason

Definition at line 252 of file http.py.

The documentation for this class was generated from the following file:

- http.py (3793)

13.114 rpki.http.http_server Class Reference

Inheritance diagram for rpki.http.http_server:

Collaboration diagram for rpki.http.http_server:

Public Member Functions

- def __init__
- def find_handler
- def handle_message
- def handle_no_content_length
- def send_error
- def send_message
- def send_reply

Public Attributes

- expect_close
- handlers

Static Public Attributes

- parse_type = http_request

  Stream parser should look for incoming HTTP request messages.

- timeout = default_server_timeout

  Use the default server timeout value set in the module header.

13.114.1 Detailed Description

```
HTTP server stream.
```

Definition at line 479 of file http.py.

13.114.2 Constructor & Destructor Documentation

13.114.2.1 def rpki.http.http_server.__init__ (*self, sock, handlers*)

Definition at line 492 of file http.py.

13.114.3 Member Function Documentation

13.114.3.1 def rpki.http.http_server.find_handler (*self, path*)

```
Helper method to search self.handlers.
```

Definition at line 506 of file http.py.

13.114.3.2 def rpki.http.http_server.handle_message (*self*)

```
HTTP layer managed to deliver a complete HTTP request to
us, figure out what to do with it.  Check the command and
Content-Type, look for a handler, and if everything looks right,
pass the message body, path, and a reply callback to the handler.
```

Definition at line 515 of file http.py.

13.114.3.3 def rpki.http.http_server.handle_no_content_length (*self*)

```
Handle an incoming message that used neither chunking nor a
Content-Length header (that is: this message will be the last one
in this server stream).  No special action required.
```

Definition at line 498 of file http.py.

13.114.3.4 def rpki.http.http_server.send_error (*self, code, reason*)

```
Send an error response to this request.
```

Definition at line 545 of file http.py.

13.114.3.5 def rpki.http.http_server.send_message (*self, code, reason = "OK", body = None*)

```
Queue up reply message.  If both parties agree that connection is
persistant, and if no error occurred, restart this stream to
listen for next message; otherwise, queue up a close event for
this stream so it will shut down once the reply has been sent.
```

Definition at line 557 of file http.py.

13.114.3.6 def rpki.http.http_server.send_reply (*self, code, body = None, reason = "OK"*)

```
Send a reply to this request.
```

Definition at line 551 of file http.py.

13.114.4 Member Data Documentation

13.114.4.1 rpki.http.http_server.expect_close

Definition at line 492 of file http.py.

13.114.4.2 rpki.http.http_server.handlers

Definition at line 492 of file http.py.

13.114.4.3 rpki::http.http_server::parse_type = http_request [static]

Stream parser should look for incoming HTTP request messages.

Definition at line 486 of file http.py.

13.114.4.4 rpki::http.http_server::timeout = default_server_timeout [static]

Use the default server timeout value set in the module header.

Definition at line 490 of file http.py.

The documentation for this class was generated from the following file:

- http.py (3793)

13.115 rpki.http.http_stream Class Reference

Inheritance diagram for rpki.http.http_stream:

Collaboration diagram for rpki.http.http_stream:

Public Member Functions

- def __init__
- def __repr__
- def chunk_body
- def chunk_discard_crlf
- def chunk_discard_trailer
- def chunk_header
- def collect_incoming_data
- def found_terminator
- def get_buffer
- def handle_body
- def handle_close
- def handle_error
- def handle_timeout
- def restart
- def update_timeout

Public Attributes

- buffer
- chunk_handler
- msg
- timer

Static Public Attributes

- log = log_method
- show_tracebacks = False

13.115.1 Detailed Description

```
Virtual class representing an HTTP message stream.
```

Definition at line 298 of file http.py.

13.115.2 Constructor & Destructor Documentation

13.115.2.1 def rpki.http.http_stream.__init__ (*self*, *sock* = `None`)

Definition at line 314 of file http.py.

13.115.3 Member Function Documentation

13.115.3.1 def rpki.http.http_stream.__repr__ (*self*)

Definition at line 306 of file http.py.

13.115.3.2 def rpki.http.http_stream.chunk_body (*self*)

```
Asynchat just handed us what should be the body of a chunk of the
body of a chunked message (sic).  Save it, and prepare to move on
to the next chunk.
```

Definition at line 406 of file http.py.

13.115.3.3 def rpki.http.http_stream.chunk_discard_crlf (*self*)

```
Consume the CRLF that terminates a chunk, reinitialize chunk
decoder to be ready for the next chunk.
```

Definition at line 418 of file http.py.

13.115.3.4 def rpki.http.http_stream.chunk_discard_trailer (*self*)

```
Consume chunk trailer, which should be empty, then (finally!) exit
the chunk decoder and hand complete message off to the application.
```

Definition at line 428 of file http.py.

13.115.3.5 def rpki.http.http_stream.chunk_header (*self*)

```
Asynchat just handed us what should be the header of one chunk of
a chunked encoding stream.  If this chunk has a body, set the
stream up to read it; otherwise, this is the last chunk, so start
the process of exiting the chunk decoder.
```

Definition at line 390 of file http.py.

13.115.3.6 def rpki.http.http_stream.collect_incoming_data (*self, data*)

```
Buffer incoming data from asynchat.
```

Definition at line 342 of file http.py.

13.115.3.7 def rpki.http.http_stream.found_terminator (*self*)

```
Asynchat reported that it found whatever terminator we set, so
figure out what to do next.  This can be messy, because we can be
in any of several different states:

@li We might be handling chunked HTTP, in which case we have to
initialize the chunk decoder;

@li We might have found the end of the message body, in which case
we can (finally) process it; or

@li We might have just gotten to the end of the message headers,
in which case we have to parse them to figure out which of three
separate mechanisms (chunked, content-length, TCP close) is going
to tell us how to find the end of the message body.
```

Definition at line 357 of file http.py.

13.115.3.8 def rpki.http.http_stream.get_buffer (*self*)

```
Consume data buffered from asynchat.
```

Definition at line 349 of file http.py.

13.115.3.9 def rpki.http.http_stream.handle_body (*self*)

```
Hand normal (not chunked) message off to the application.
```

Definition at line 439 of file http.py.

13.115.3.10 def rpki.http.http_stream.handle_close (*self*)

```
Wrapper around asynchat connection close handler, so that we can
log the event, cancel timer, and so forth.
```

Reimplemented in rpki.http.http_client.

Definition at line 470 of file http.py.

13.115.3.11 def rpki.http.http_stream.handle_error (*self*)

```
Asynchat (or asyncore, or somebody) raised an exception.  See
whether it's one we should just pass along, otherwise log a stack
trace and close the stream.
```

Reimplemented in rpki.http.http_client.

Definition at line 446 of file http.py.

13.115.3.12 def rpki.http.http_stream.handle_timeout (*self*)

```
Inactivity timer expired, close connection with prejudice.
```

Reimplemented in rpki.http.http_client.

Definition at line 463 of file http.py.

13.115.3.13 def rpki.http.http_stream.restart (*self*)

```
(Re)start HTTP message parser, reset timer.
```

Definition at line 320 of file http.py.

13.115.3.14 def rpki.http.http_stream.update_timeout (*self*)

```
Put this stream's timer in known good state: set it to the
stream's timeout value if we're doing timeouts, otherwise clear
it.
```

Definition at line 329 of file http.py.

13.115.4 Member Data Documentation

13.115.4.1 rpki.http.http_stream.buffer

Definition at line 314 of file http.py.

13.115.4.2 rpki.http.http_stream.chunk_handler

Definition at line 322 of file http.py.

13.115.4.3 rpki.http.http_stream.log = log_method [static]

Definition at line 303 of file http.py.

13.115.4.4 rpki.http.http_stream.msg

Definition at line 372 of file http.py.

13.115.4.5 rpki.http.http_stream.show_tracebacks = False [static]

Definition at line 304 of file http.py.

13.115.4.6 rpki.http.http_stream.timer

Definition at line 314 of file http.py.

The documentation for this class was generated from the following file:

- http.py (3793)

13.116 rpki.ipaddrs.v4addr Class Reference

Inheritance diagram for rpki.ipaddrs.v4addr:

Collaboration diagram for rpki.ipaddrs.v4addr:

Public Member Functions

- def __new__
- def __str__
- def from_bytes
- def to_bytes

Static Public Attributes

- int bits = 32

13.116.1 Detailed Description

```
IPv4 address.
```

```
Derived from long, but supports IPv4 print syntax.
```

Definition at line 47 of file ipaddrs.py.

13.116.2 Member Function Documentation

13.116.2.1 def rpki.ipaddrs.v4addr.__new__ (*cls, x*)

```
Construct a v4addr object.
```

Definition at line 56 of file ipaddrs.py.

13.116.2.2 def rpki.ipaddrs.v4addr.__str__ (*self*)

```
Convert a v4addr object to string format.
```

Definition at line 78 of file ipaddrs.py.

13.116.2.3 def rpki.ipaddrs.v4addr.from_bytes (*cls, x*)

```
Convert from a raw byte string to a v4addr object.
```

Definition at line 72 of file ipaddrs.py.

13.116.2.4 def rpki.ipaddrs.v4addr.to_bytes (*self*)

```
Convert a v4addr object to a raw byte string.
```

Definition at line 65 of file ipaddrs.py.

13.116.3 Member Data Documentation

13.116.3.1 int rpki.ipaddrs.v4addr.bits = 32 `[static]`

Definition at line 54 of file ipaddrs.py.

The documentation for this class was generated from the following file:

- ipaddrs.py (3551)

13.117 rpki.ipaddrs.v6addr Class Reference

Inheritance diagram for rpki.ipaddrs.v6addr:

Collaboration diagram for rpki.ipaddrs.v6addr:

Public Member Functions

- def __new__
- def __str__
- def from_bytes
- def to_bytes

Static Public Attributes

- int bits = 128

13.117.1 Detailed Description

```
IPv6 address.
```

```
Derived from long, but supports IPv6 print syntax.
```

Definition at line 84 of file ipaddrs.py.

13.117.2 Member Function Documentation

13.117.2.1 def rpki.ipaddrs.v6addr.__new__ (*cls, x*)

```
Construct a v6addr object.
```

Definition at line 93 of file ipaddrs.py.

13.117.2.2 def rpki.ipaddrs.v6addr.__str__ (*self*)

```
Convert a v6addr object to string format.
```

Definition at line 116 of file ipaddrs.py.

13.117.2.3 def rpki.ipaddrs.v6addr.from_bytes (*cls, x*)

```
Convert from a raw byte string to a v6addr object.
```

Definition at line 109 of file ipaddrs.py.

13.117.2.4 def rpki.ipaddrs.v6addr.to_bytes (*self*)

```
Convert a v6addr object to a raw byte string.
```

Definition at line 102 of file ipaddrs.py.

13.117.3 Member Data Documentation

13.117.3.1 int rpki.ipaddrs.v6addr.bits = 128 [static]

Definition at line 91 of file ipaddrs.py.

The documentation for this class was generated from the following file:

- ipaddrs.py (3551)

13.118 rpki.irdbd.main Class Reference

Inheritance diagram for rpki.irdbd.main:

Collaboration diagram for rpki.irdbd.main:

Public Member Functions

- def __init__
- def handle_list_ghostbuster_requests
- def handle_list_resources
- def handle_list_roa_requests

- def handler

Public Attributes

- bpki_ta
- cfg
- cur
- db
- irdbd_cert
- irdbd_key
- rpkid_cert

Static Public Attributes

- dictionary handle_dispatch

13.118.1 Detailed Description

Definition at line 51 of file rpki/irdbd.py.

13.118.2 Constructor & Destructor Documentation

13.118.2.1 def rpki.irdbd.main.__init__ (*self*)

Definition at line 202 of file rpki/irdbd.py.

13.118.3 Member Function Documentation

13.118.3.1 def rpki.irdbd.main.handle_list_ghostbuster_requests (*self, q_pdu, r_msg*)

Definition at line 118 of file rpki/irdbd.py.

13.118.3.2 def rpki.irdbd.main.handle_list_resources (*self, q_pdu, r_msg*)

Definition at line 54 of file rpki/irdbd.py.

13.118.3.3 def rpki.irdbd.main.handle_list_roa_requests (*self, q_pdu, r_msg*)

Definition at line 92 of file rpki/irdbd.py.

13.118.3.4 def rpki.irdbd.main.handler (*self, query, path, cb*)

Definition at line 149 of file rpki/irdbd.py.

13.118.4 Member Data Documentation

13.118.4.1 rpki.irdbd.main.bpki_ta

Definition at line 202 of file rpki/irdbd.py.

13.118.4.2 rpki.irdbd.main.cfg

Definition at line 202 of file rpki/irdbd.py.

13.118.4.3 rpki.irdbd.main.cur

Definition at line 202 of file rpki/irdbd.py.

13.118.4.4 rpki.irdbd.main.db

Definition at line 202 of file rpki/irdbd.py.

13.118.4.5 dictionary rpki.irdbd.main.handle_dispatch [static]

Initial value:

```
{
    rpki.left_right.list_resources_elt            : handle_list_resources,
```

```
rpki.left_right.list_roa_requests_elt         : handle_list_roa_requests,
rpki.left_right.list_ghostbuster_requests_elt : handle_list_ghostbuster_reque
  sts}
```

Definition at line 143 of file rpki/irdbd.py.

13.118.4.6 rpki.irdbd.main.irdbd_cert

Definition at line 202 of file rpki/irdbd.py.

13.118.4.7 rpki.irdbd.main.irdbd_key

Definition at line 202 of file rpki/irdbd.py.

13.118.4.8 rpki.irdbd.main.rpkid_cert

Definition at line 202 of file rpki/irdbd.py.

The documentation for this class was generated from the following file:

- rpki/irdbd.py (3793)

13.119 rpki.left_right.bsc_elt Class Reference

Inheritance diagram for rpki.left_right.bsc_elt:

Collaboration diagram for rpki.left_right.bsc_elt:

Public Member Functions

- def children
- def parents
- def repositories
- def serve_pre_save_hook

Static Public Attributes

- tuple attributes = ("action", "tag", "self_handle", "bsc_handle", "key_type", "hash_-alg", "key_length")

  XML attributes for this element.

- tuple booleans = ("generate_keypair",)

  Boolean attributes (value "yes" or "no") for this element.

- string element_name = "bsc"
- tuple elements = ("signing_cert", "signing_cert_crl", "pkcs10_request")

  XML elements contained by this element.

- tuple handles = (("self", self_elt),)
- pkcs10_request = None
- private_key_id = None
- signing_cert = None
- signing_cert_crl = None
- tuple sql_template

13.119.1 Detailed Description

```
<bsc/> (Business Signing Context) element.
```

Definition at line 707 of file left_right.py.

13.119.2 Member Function Documentation

13.119.2.1 def rpki.left_right.bsc_elt.children (*self*)

```
Fetch all child objects that link to this BSC object.
```

Definition at line 745 of file left_right.py.

13.119.2.2 def rpki.left_right.bsc_elt.parents (*self*)

```
Fetch all parent objects that link to this BSC object.
```

Definition at line 738 of file left_right.py.

13.119.2.3 def rpki.left_right.bsc_elt.repositories (*self*)

```
Fetch all repository objects that link to this BSC object.
```

Definition at line 731 of file left_right.py.

13.119.2.4 def rpki.left_right.bsc_elt.serve_pre_save_hook (*self, q_pdu, r_pdu, cb, eb*)

```
Extra server actions for bsc_elt -- handle key generation.  For
now this only allows RSA with SHA-256.
```

Reimplemented from rpki.left_right.data_elt.

Definition at line 751 of file left_right.py.

13.119.3 Member Data Documentation

13.119.3.1 tuple rpki.left_right.bsc_elt.attributes = ("action", "tag", "self_handle", "bsc_handle", "key_type", "hash_alg", "key_length") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 713 of file left_right.py.

13.119.3.2 tuple rpki.left_right.bsc_elt.booleans = ("generate_keypair",) [static]

Boolean attributes (value "yes" or "no") for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 715 of file left_right.py.

13.119.3.3 string rpki.left_right.bsc_elt.element_name = "bsc" [static]

Definition at line 712 of file left_right.py.

13.119.3.4 tuple rpki.left_right.bsc_elt.elements = ("signing_cert", "signing_cert_crl", "pkcs10_request") [static]

XML elements contained by this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 714 of file left_right.py.

13.119.3.5 tuple rpki.left_right.bsc_elt.handles = (("self", self_elt),) [static]

Reimplemented from rpki.left_right.data_elt.

Definition at line 723 of file left_right.py.

13.119.3.6 rpki.left_right.bsc_elt.pkcs10_request = None [static]

Definition at line 726 of file left_right.py.

13.119.3.7 rpki.left_right.bsc_elt.private_key_id = None [static]

Definition at line 725 of file left_right.py.

13.119.3.8 rpki.left_right.bsc_elt.signing_cert = None [static]

Reimplemented in irbe_cli.bsc_elt.

Definition at line 727 of file left_right.py.

13.119.3.9 rpki.left_right.bsc_elt.signing_cert_crl = None [static]

Reimplemented in irbe_cli.bsc_elt.

Definition at line 728 of file left_right.py.

13.119.3.10 tuple rpki.left_right.bsc_elt.sql_template [static]

Initial value:

```
rpki.sql.template("bsc", "bsc_id", "bsc_handle",
                                   "self_id", "hash_alg",
                                   ("private_key_id", rpki.x509.RSA),
                                   ("pkcs10_request", rpki.x509.PKCS10),
                                   ("signing_cert", rpki.x509.X509),
                                   ("signing_cert_crl", rpki.x509.CRL))
```

Definition at line 717 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.120 rpki.left_right.child_elt Class Reference

Inheritance diagram for rpki.left_right.child_elt:

Collaboration diagram for rpki.left_right.child_elt:

Public Member Functions

- def ca_from_class_name
- def child_certs
- def fetch_child_certs
- def parents
- def serve_destroy_hook
- def serve_post_save_hook
- def serve_reissue
- def serve_up_down

Static Public Attributes

- tuple attributes = ("action", "tag", "self_handle", "child_handle", "bsc_handle")

  XML attributes for this element.

- tuple booleans = ("reissue",)

  Boolean attributes (value "yes" or "no") for this element.

- bpki_cert = None
- bpki_glue = None
- string element_name = "child"
- tuple elements = ("bpki_cert", "bpki_glue")

  XML elements contained by this element.

- tuple handles = (("self", self_elt), ("bsc", bsc_elt))
- tuple sql_template

13.120.1 Detailed Description

```
<child/> element.
```

Definition at line 1018 of file left_right.py.

13.120.2 Member Function Documentation

13.120.2.1 def rpki.left_right.child_elt.ca_from_class_name (*self, class_name*)

```
Fetch the CA corresponding to an up-down class_name.
```

Definition at line 1077 of file left_right.py.

13.120.2.2 def rpki.left_right.child_elt.child_certs (*self*)

```
Fetch all child_cert objects that link to this child object.
```

Definition at line 1046 of file left_right.py.

13.120.2.3 def rpki.left_right.child_elt.fetch_child_certs (*self, ca_detail = None, ski = None, unique = False*)

```
Fetch all child_cert objects that link to this child object.
```

Definition at line 1039 of file left_right.py.

13.120.2.4 def rpki.left_right.child_elt.parents (*self*)

```
Fetch all parent objects that link to self object to which this child object links.
```

Definition at line 1053 of file left_right.py.

13.120.2.5 def rpki.left_right.child_elt.serve_destroy_hook (*self, cb, eb*)

```
Extra server actions when destroying a child_elt.
```

Reimplemented from rpki.xml_utils.data_elt.

Definition at line 1091 of file left_right.py.

13.120.2.6 def rpki.left_right.child_elt.serve_post_save_hook (*self, q_pdu, r_pdu, cb, eb*)

```
Extra server actions for child_elt.
```

Reimplemented from rpki.xml_utils.data_elt.

Definition at line 1059 of file left_right.py.

13.120.2.7 def rpki.left_right.child_elt.serve_reissue (*self, cb, eb*)

```
Handle a left-right reissue action for this child.
```

Definition at line 1068 of file left_right.py.

13.120.2.8 def rpki.left_right.child_elt.serve_up_down (*self, query, callback*)

```
Outer layer of server handling for one up-down PDU from this child.
```

Definition at line 1101 of file left_right.py.

13.120.3 Member Data Documentation

13.120.3.1 tuple rpki.left_right.child_elt.attributes = ("action", "tag", "self_handle", "child_handle", "bsc_handle") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1024 of file left_right.py.

13.120.3.2 tuple rpki.left_right.child_elt.booleans = ("reissue",) [static]

Boolean attributes (value "yes" or "no") for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1026 of file left_right.py.

13.120.3.3 rpki.left_right.child_elt.bpki_cert = None [static]

Definition at line 1036 of file left_right.py.

13.120.3.4 rpki.left_right.child_elt.bpki_glue = None [static]

Definition at line 1037 of file left_right.py.

13.120.3.5 string rpki.left_right.child_elt.element_name = "child" [static]

Definition at line 1023 of file left_right.py.

13.120.3.6 tuple rpki.left_right.child_elt.elements = ("bpki_cert", "bpki_glue") [static]

XML elements contained by this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1025 of file left_right.py.

13.120.3.7 tuple rpki.left_right.child_elt.handles = (("self", self_elt), ("bsc", bsc_elt)) [static]

Reimplemented from rpki.left_right.data_elt.

Definition at line 1034 of file left_right.py.

13.120.3.8 tuple rpki.left_right.child_elt.sql_template [static]

Initial value:

```
rpki.sql.template("child", "child_id", "child_handle",
                                  "self_id", "bsc_id",
                                  ("bpki_cert", rpki.x509.X509),
                                  ("bpki_glue", rpki.x509.X509),
                                  ("last_cms_timestamp", rpki.sundial.datetime))
```

Definition at line 1028 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.121 rpki.left_right.cms_msg Class Reference

Inheritance diagram for rpki.left_right.cms_msg:

Collaboration diagram for rpki.left_right.cms_msg:

Static Public Attributes

- string encoding = "us-ascii"
- saxify = sax_handler.saxify
- schema = rpki.relaxng.left_right

13.121.1 Detailed Description

```
Class to hold a CMS-signed left-right PDU.
```

Definition at line 1362 of file left_right.py.

13.121.2 Member Data Documentation

13.121.2.1 string rpki.left_right.cms_msg.encoding = "us-ascii" [static]

Definition at line 1367 of file left_right.py.

13.121.2.2 rpki.left_right.cms_msg.saxify = sax_handler.saxify [static]

Reimplemented in irbe_cli.left_right_cms_msg.

Definition at line 1369 of file left_right.py.

13.121.2.3 rpki.left_right.cms_msg.schema = rpki.relaxng.left_right [static]

Definition at line 1368 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.122 rpki.left_right.data_elt Class Reference

Inheritance diagram for rpki.left_right.data_elt:

Collaboration diagram for rpki.left_right.data_elt:

Public Member Functions

- def bsc
- def make_reply_clone_hook
- def self
- def serve_fetch_all
- def serve_fetch_handle
- def serve_fetch_one_maybe
- def serve_pre_save_hook

Static Public Attributes

- tuple handles = ()
- self_handle = None
- self_id = None

13.122.1 Detailed Description

```
Virtual class for top-level left-right protocol data elements.
```

Definition at line 50 of file left_right.py.

13.122.2 Member Function Documentation

13.122.2.1 def rpki.left_right.data_elt.bsc (*self*)

```
Return BSC object to which this object links.
```

Definition at line 68 of file left_right.py.

13.122.2.2 def rpki.left_right.data_elt.make_reply_clone_hook (*self, r_pdu*)

```
Set handles when cloning, including _id -> _handle translation.
```

Reimplemented from rpki.xml_utils.data_elt.

Definition at line 74 of file left_right.py.

13.122.2.3 def rpki.left_right.data_elt.self (*self*)

```
Fetch self object to which this object links.
```

Definition at line 61 of file left_right.py.

13.122.2.4 def rpki.left_right.data_elt.serve_fetch_all (*self*)

```
Find the objects on which a list method should operate.
```

Reimplemented in rpki.left_right.self_elt.

Definition at line 105 of file left_right.py.

13.122.2.5 def rpki.left_right.data_elt.serve_fetch_handle (*cls, gctx, self_id, handle*)

```
Find an object based on its handle.
```

Reimplemented in rpki.left_right.self_elt.

Definition at line 90 of file left_right.py.

13.122.2.6 def rpki.left_right.data_elt.serve_fetch_one_maybe (*self*)

```
Find the object on which a get, set, or destroy method should
operate, or which would conflict with a create method.
```

Reimplemented in rpki.left_right.self_elt.

Definition at line 96 of file left_right.py.

13.122.2.7 def rpki.left_right.data_elt.serve_pre_save_hook (*self, q_pdu, r_pdu, cb, eb*)

```
Hook to do _handle => _id translation before saving.

self is always the object to be saved to SQL.  For create
operations, self and q_pdu are be the same object; for set
operations, self is the pre-existing object from SQL and q_pdu is
the set request received from the the IRBE.
```

Reimplemented from rpki.xml_utils.data_elt.

Reimplemented in rpki.left_right.bsc_elt.

Definition at line 112 of file left_right.py.

13.122.3 Member Data Documentation

13.122.3.1 tuple rpki.left_right.data_elt.handles = () [static]

Reimplemented in rpki.left_right.self_elt, rpki.left_right.bsc_elt, rpki.left_right.repository_-elt, rpki.left_right.parent_elt, and rpki.left_right.child_elt.

Definition at line 55 of file left_right.py.

13.122.3.2 rpki.left_right.data_elt.self_handle = None [static]

Definition at line 58 of file left_right.py.

13.122.3.3 rpki.left_right.data_elt.self_id = None [static]

Definition at line 57 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.123 rpki.left_right.left_right_namespace Class Reference

Inheritance diagram for rpki.left_right.left_right_namespace:

Collaboration diagram for rpki.left_right.left_right_namespace:

Static Public Attributes

- dictionary nsmap = { None : xmlns }
- string xmlns = "http://www.hactrn.net/uris/rpki/left-right-spec/"

13.123.1 Detailed Description

```
XML namespace parameters for left-right protocol.
```

Definition at line 42 of file left_right.py.

13.123.2 Member Data Documentation

13.123.2.1 dictionary rpki.left_right.left_right_namespace.nsmap = { None : xmlns } [static]

Definition at line 48 of file left_right.py.

13.123.2.2 string rpki.left_right.left_right_namespace.xmlns = "http://www.hactrn.net/uris/rpki/left-right-spec/" [static]

Definition at line 47 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.124 rpki.left_right.list_ghostbuster_requests_elt Class Reference

Inheritance diagram for rpki.left_right.list_ghostbuster_requests_elt:

Collaboration diagram for rpki.left_right.list_ghostbuster_requests_elt:

Static Public Attributes

- tuple attributes = ("self_handle", "tag", "parent_handle")

  XML attributes for this element.

- string element_name = "list_ghostbuster_requests"
- string text_attribute = "vcard"

  Name of the class attribute that holds the text value.

- vcard = None

13.124.1 Detailed Description

`<list_ghostbuster_requests/> element.`

Definition at line 1195 of file left_right.py.

13.124.2 Member Data Documentation

13.124.2.1 tuple rpki.left_right.list_ghostbuster_requests_elt.attributes = ("self_handle", "tag", "parent_handle") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1201 of file left_right.py.

13.124.2.2 string rpki.left_right.list_ghostbuster_requests_elt.element_name = "list_ghostbuster_requests" [static]

Definition at line 1200 of file left_right.py.

13.124.2.3 string rpki.left_right.list_ghostbuster_requests_elt.text_attribute = "vcard" [static]

Name of the class attribute that holds the text value.

Reimplemented from rpki.xml_utils.text_elt.

Definition at line 1202 of file left_right.py.

13.124.2.4 rpki.left_right.list_ghostbuster_requests_elt.vcard = None [static]

Definition at line 1204 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.125 rpki.left_right.list_published_objects_elt Class Reference

Inheritance diagram for rpki.left_right.list_published_objects_elt:

Collaboration diagram for rpki.left_right.list_published_objects_elt:

Public Member Functions

- def make_reply
- def serve_dispatch

Static Public Attributes

- tuple attributes = ("self_handle", "tag", "uri")

  XML attributes for this element.

- string element_name = "list_published_objects"
- obj = None
- string text_attribute = "obj"

  Name of the class attribute that holds the text value.

13.125.1 Detailed Description

```
<list_published_objects/> element.
```

Definition at line 1207 of file left_right.py.

13.125.2 Member Function Documentation

13.125.2.1 def rpki.left_right.list_published_objects_elt.make_reply (*self, uri, obj*)

```
Generate one reply PDU.
```

Definition at line 1235 of file left_right.py.

13.125.2.2 def rpki.left_right.list_published_objects_elt.serve_dispatch (*self, r_msg, cb, eb*)

```
Handle a <list_published_objects/> query.  The method name is a
misnomer here, there's no action attribute and no dispatch, we
just dump every published object for the specified <self/> and return.
```

Definition at line 1218 of file left_right.py.

13.125.3 Member Data Documentation

13.125.3.1 tuple rpki.left_right.list_published_objects_elt.attributes = ("self_handle", "tag", "uri") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1213 of file left_right.py.

13.125.3.2 string rpki.left_right.list_published_objects_elt.element_name = "list_published_objects" [static]

Definition at line 1212 of file left_right.py.

13.125.3.3 rpki.left_right.list_published_objects_elt.obj = None [static]

Definition at line 1216 of file left_right.py.

13.125.3.4 string rpki.left_right.list_published_objects_elt.text_attribute = "obj" [static]

Name of the class attribute that holds the text value.

Reimplemented from rpki.xml_utils.text_elt.

Definition at line 1214 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.126 rpki.left_right.list_received_resources_elt Class Reference

Inheritance diagram for rpki.left_right.list_received_resources_elt:

Collaboration diagram for rpki.left_right.list_received_resources_elt:

Public Member Functions

- def make_reply
- def serve_dispatch

Static Public Attributes

- tuple attributes

XML attributes for this element.

- string element_name = "list_received_resources"

13.126.1 Detailed Description

```
<list_received_resources/> element.
```

Definition at line 1243 of file left_right.py.

13.126.2 Member Function Documentation

13.126.2.1 def rpki.left_right.list_received_resources_elt.make_reply (*self, parent_handle, uri, cert*)

```
Generate one reply PDU.
```

Definition at line 1266 of file left_right.py.

13.126.2.2 def rpki.left_right.list_received_resources_elt.serve_dispatch (*self, r_msg, cb, eb*)

```
Handle a <list_received_resources/> query.  The method name is a
misnomer here, there's no action attribute and no dispatch, we
just dump a bunch of data about every certificate issued to us by
one of our parents, then return.
```

Definition at line 1252 of file left_right.py.

13.126.3 Member Data Documentation

13.126.3.1 tuple rpki.left_right.list_received_resources_elt.attributes [static]

Initial value:

```
("self_handle", "tag", "parent_handle",
                "notBefore", "notAfter", "uri", "sia_uri", "aia_uri", "asn", "ipv
      4", "ipv6")
```

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1249 of file left_right.py.

13.126.3.2 string rpki.left_right.list_received_resources_elt.element_name = "list_received_resources" [static]

Definition at line 1248 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.127 rpki.left_right.list_resources_elt Class Reference

Inheritance diagram for rpki.left_right.list_resources_elt:

Collaboration diagram for rpki.left_right.list_resources_elt:

Public Member Functions

- def startElement
- def toXML

Public Attributes

- asn
- ipv4
- ipv6

Static Public Attributes

- tuple attributes = ("self_handle", "tag", "child_handle", "valid_until", "asn", "ipv4", "ipv6")

  XML attributes for this element.

- string element_name = "list_resources"
- valid_until = None

13.127.1 Detailed Description

```
<list_resources/> element.
```

Definition at line 1140 of file left_right.py.

13.127.2 Member Function Documentation

13.127.2.1 def rpki.left_right.list_resources_elt.startElement (*self, stack, name, attrs*)

```
Handle <list_resources/> element.  This requires special handling
due to the data types of some of the attributes.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1149 of file left_right.py.

13.127.2.2 def rpki.left_right.list_resources_elt.toXML (*self*)

```
Generate <list_resources/> element.  This requires special
handling due to the data types of some of the attributes.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1165 of file left_right.py.

13.127.3 Member Data Documentation

13.127.3.1 rpki.left_right.list_resources_elt.asn

Definition at line 1152 of file left_right.py.

13.127.3.2 tuple rpki.left_right.list_resources_elt.attributes = ("self_handle", "tag", "child_handle", "valid_until", "asn", "ipv4", "ipv6") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1146 of file left_right.py.

13.127.3.3 string rpki.left_right.list_resources_elt.element_name = "list_resources" [static]

Definition at line 1145 of file left_right.py.

13.127.3.4 rpki.left_right.list_resources_elt.ipv4

Definition at line 1152 of file left_right.py.

13.127.3.5 rpki.left_right.list_resources_elt.ipv6

Definition at line 1152 of file left_right.py.

13.127.3.6 rpki.left_right.list_resources_elt.valid_until = None [static]

Definition at line 1147 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.128 rpki.left_right.list_roa_requests_elt Class Reference

Inheritance diagram for rpki.left_right.list_roa_requests_elt:

Collaboration diagram for rpki.left_right.list_roa_requests_elt:

Public Member Functions

- def startElement

Public Attributes

- ipv4

- ipv6

Static Public Attributes

- tuple attributes = ("self_handle", "tag", "asn", "ipv4", "ipv6")

  XML attributes for this element.

- string element_name = "list_roa_requests"

13.128.1 Detailed Description

```
<list_roa_requests/> element.
```

Definition at line 1175 of file left_right.py.

13.128.2 Member Function Documentation

13.128.2.1 def rpki.left_right.list_roa_requests_elt.startElement (*self, stack, name, attrs*)

```
Handle <list_roa_requests/> element.  This requires special handling
due to the data types of some of the attributes.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1183 of file left_right.py.

13.128.3 Member Data Documentation

13.128.3.1 tuple rpki.left_right.list_roa_requests_elt.attributes = ("self_handle", "tag", "asn", "ipv4", "ipv6") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1181 of file left_right.py.

13.128.3.2 string rpki.left_right.list_roa_requests_elt.element_name = "list_roa_requests" [static]

Definition at line 1180 of file left_right.py.

13.128.3.3 rpki.left_right.list_roa_requests_elt.ipv4

Definition at line 1186 of file left_right.py.

13.128.3.4 rpki.left_right.list_roa_requests_elt.ipv6

Definition at line 1186 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.129 rpki.left_right.msg Class Reference

Inheritance diagram for rpki.left_right.msg:

Collaboration diagram for rpki.left_right.msg:

Public Member Functions

- def serve_top_level

Static Public Attributes

- tuple pdus

  Dispatch table of PDUs for this protocol.

- int version = 1

  Protocol version.

13.129.1 Detailed Description

```
Left-right PDU.
```

Definition at line 1307 of file left_right.py.

13.129.2 Member Function Documentation

13.129.2.1 def rpki.left_right.msg.serve_top_level (*self, gctx, cb*)

```
Serve one msg PDU.
```

Definition at line 1325 of file left_right.py.

13.129.3 Member Data Documentation

13.129.3.1 rpki::left_right.msg::pdus [static]

Initial value:

```
dict((x.element_name, x)
              for x in (self_elt, child_elt, parent_elt, bsc_elt,
                        repository_elt, list_resources_elt,
                        list_roa_requests_elt, list_ghostbuster_requests_elt,
                        list_published_objects_elt,
                        list_received_resources_elt, report_error_elt))
```

Dispatch table of PDUs for this protocol.

Reimplemented in irbe_cli.left_right_msg.

Definition at line 1318 of file left_right.py.

13.129.3.2 rpki::left_right.msg::version = 1 [static]

Protocol version.

Reimplemented from rpki.xml_utils.msg.

Definition at line 1314 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.130 rpki.left_right.parent_elt Class Reference

Inheritance diagram for rpki.left_right.parent_elt:

Collaboration diagram for rpki.left_right.parent_elt:

Public Member Functions

- def cas
- def query_up_down
- def repository
- def serve_post_save_hook
- def serve_reissue
- def serve_rekey
- def serve_revoke
- def serve_revoke_forgotten

Static Public Attributes

- tuple attributes

  XML attributes for this element.

- tuple booleans = ("rekey", "reissue", "revoke", "revoke_forgotten")

  Boolean attributes (value "yes" or "no") for this element.

- bpki_cms_cert = None
- bpki_cms_glue = None
- string element_name = "parent"
- tuple elements = ("bpki_cms_cert", "bpki_cms_glue")

  XML elements contained by this element.

- tuple handles = (("self", self_elt), ("bsc", bsc_elt), ("repository", repository_elt))
- tuple sql_template

13.130.1 Detailed Description

```
<parent/> element.
```

Definition at line 855 of file left_right.py.

13.130.2 Member Function Documentation

13.130.2.1 def rpki.left_right.parent_elt.cas (*self*)

```
Fetch all CA objects that link to this parent object.
```

Definition at line 887 of file left_right.py.

13.130.2.2 def rpki.left_right.parent_elt.query_up_down (*self, q_pdu, cb, eb*)

```
Client code for sending one up-down query PDU to this parent.
```

Definition at line 974 of file left_right.py.

13.130.2.3 def rpki.left_right.parent_elt.repository (*self*)

```
Fetch repository object to which this parent object links.
```

Definition at line 880 of file left_right.py.

13.130.2.4 def rpki.left_right.parent_elt.serve_post_save_hook (*self, q_pdu, r_pdu, cb, eb*)

```
Extra server actions for parent_elt.
```

Reimplemented from rpki.xml_utils.data_elt.

Definition at line 893 of file left_right.py.

13.130.2.5 def rpki.left_right.parent_elt.serve_reissue (*self, cb, eb*)

```
Handle a left-right reissue action for this parent.
```

Definition at line 926 of file left_right.py.

13.130.2.6 def rpki.left_right.parent_elt.serve_rekey (*self, cb, eb*)

```
Handle a left-right rekey action for this parent.
```

Definition at line 910 of file left_right.py.

13.130.2.7 def rpki.left_right.parent_elt.serve_revoke (*self, cb, eb*)

```
Handle a left-right revoke action for this parent.
```

Definition at line 918 of file left_right.py.

13.130.2.8 def rpki.left_right.parent_elt.serve_revoke_forgotten (*self, cb, eb*)

```
Handle a left-right revoke_forgotten action for this parent.

This is a bit fiddly: we have to compare the result of an up-down
list query with what we have locally and identify the SKIs of any
certificates that have gone missing.  This should never happen in
ordinary operation, but can arise if we have somehow lost a
private key, in which case there is nothing more we can do with
the issued cert, so we have to clear it.  As this really is not
supposed to happen, we don't clear it automatically, instead we
require an explicit trigger.
```

Definition at line 934 of file left_right.py.

13.130.3 Member Data Documentation

13.130.3.1 tuple rpki.left_right.parent_elt.attributes [static]

Initial value:

```
("action", "tag", "self_handle", "parent_handle", "bsc_handle", "repository_handl
      e",
                "peer_contact_uri", "sia_base", "sender_name", "recipient_name")
```

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 861 of file left_right.py.

13.130.3.2 tuple rpki.left_right.parent_elt.booleans = ("rekey", "reissue", "revoke", "revoke_forgotten") [static]

Boolean attributes (value "yes" or "no") for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 864 of file left_right.py.

13.130.3.3 rpki.left_right.parent_elt.bpki_cms_cert = None [static]

Definition at line 876 of file left_right.py.

13.130.3.4 rpki.left_right.parent_elt.bpki_cms_glue = None [static]

Definition at line 877 of file left_right.py.

13.130.3.5 string rpki.left_right.parent_elt.element_name = "parent" [static]

Definition at line 860 of file left_right.py.

13.130.3.6 tuple rpki.left_right.parent_elt.elements = ("bpki_cms_cert", "bpki_cms_glue") [static]

XML elements contained by this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 863 of file left_right.py.

13.130.3.7 tuple rpki.left_right.parent_elt.handles = (("self", self_elt), ("bsc", bsc_elt), ("repository", repository_elt)) [static]

Reimplemented from rpki.left_right.data_elt.

Definition at line 874 of file left_right.py.

13.130.3.8 tuple rpki.left_right.parent_elt.sql_template [static]

Initial value:

```
rpki.sql.template("parent", "parent_id", "parent_handle",
                                  "self_id", "bsc_id", "repository_id",
                                  "peer_contact_uri", "sia_base",
                                  "sender_name", "recipient_name",
                                  ("bpki_cms_cert", rpki.x509.X509),
                                  ("bpki_cms_glue", rpki.x509.X509),
                                  ("last_cms_timestamp", rpki.sundial.datetime))
```

Definition at line 866 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.131 rpki.left_right.report_error_elt Class Reference

Inheritance diagram for rpki.left_right.report_error_elt:

Collaboration diagram for rpki.left_right.report_error_elt:

Public Member Functions

- def from_exception

Public Attributes

- error_code
- self_handle
- tag

Static Public Attributes

- tuple attributes = ("tag", "self_handle", "error_code")

  XML attributes for this element.

- string element_name = "report_error"
- error_text = None
- string text_attribute = "error_text"

  Name of the class attribute that holds the text value.

13.131.1 Detailed Description

```
<report_error/> element.
```

Definition at line 1284 of file left_right.py.

13.131.2 Member Function Documentation

13.131.2.1 def rpki.left_right.report_error_elt.from_exception (*cls*, *e*, *self_handle* = `None`, *tag* = `None`)

```
Generate a <report_error/> element from an exception.
```

Definition at line 1296 of file left_right.py.

13.131.3 Member Data Documentation

13.131.3.1 tuple rpki.left_right.report_error_elt.attributes = ("tag", "self_handle", "error_code") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 1290 of file left_right.py.

13.131.3.2 string rpki.left_right.report_error_elt.element_name = "report_error" [static]

Definition at line 1289 of file left_right.py.

13.131.3.3 rpki.left_right.report_error_elt.error_code

Definition at line 1298 of file left_right.py.

13.131.3.4 rpki.left_right.report_error_elt.error_text = None [static]

Definition at line 1293 of file left_right.py.

13.131.3.5 rpki.left_right.report_error_elt.self_handle

Definition at line 1298 of file left_right.py.

13.131.3.6 rpki.left_right.report_error_elt.tag

Definition at line 1298 of file left_right.py.

13.131.3.7 string rpki.left_right.report_error_elt.text_attribute = "error_text" [static]

Name of the class attribute that holds the text value.

Reimplemented from rpki.xml_utils.text_elt.

Definition at line 1291 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.132 rpki.left_right.repository_elt Class Reference

Inheritance diagram for rpki.left_right.repository_elt:

Collaboration diagram for rpki.left_right.repository_elt:

Public Member Functions

- def call_pubd
- def default_pubd_handler
- def parents

Static Public Attributes

- tuple attributes = ("action", "tag", "self_handle", "repository_handle", "bsc_-handle", "peer_contact_uri")

  XML attributes for this element.

- bpki_cert = None
- bpki_glue = None
- string element_name = "repository"
- tuple elements = ("bpki_cert", "bpki_glue")

  XML elements contained by this element.

- tuple handles = (("self", self_elt), ("bsc", bsc_elt))
- tuple sql_template

13.132.1 Detailed Description

```
<repository/> element.
```

Definition at line 763 of file left_right.py.

13.132.2 Member Function Documentation

13.132.2.1 def rpki.left_right.repository_elt.call_pubd (*self, callback, errback, q_msg, handlers* = `None`)

```
Send a message to publication daemon and return the response.

As a convenience, attempting to send an empty message returns
immediate success without sending anything.

Handlers is a dict of handler functions to process the response
PDUs.  If the tag value in the response PDU appears in the dict,
the associated handler is called to process the PDU.  If no tag
matches, default_pubd_handler() is called.  A handler value of
False suppresses calling of the default handler.
```

Definition at line 797 of file left_right.py.

13.132.2.2 def rpki.left_right.repository_elt.default_pubd_handler (*pdu*)

```
Default handler for publication response PDUs.
```

Definition at line 791 of file left_right.py.

13.132.2.3 def rpki.left_right.repository_elt.parents (*self*)

```
Fetch all parent objects that link to this repository object.
```

Definition at line 784 of file left_right.py.

13.132.3 Member Data Documentation

13.132.3.1 tuple rpki.left_right.repository_elt.attributes = ("action", "tag", "self_handle", "repository_handle", "bsc_handle", "peer_contact_uri") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 769 of file left_right.py.

13.132.3.2 rpki.left_right.repository_elt.bpki_cert = None [static]

Definition at line 780 of file left_right.py.

13.132.3.3 rpki.left_right.repository_elt.bpki_glue = None [static]

Definition at line 781 of file left_right.py.

13.132.3.4 string rpki.left_right.repository_elt.element_name = "repository" [static]

Definition at line 768 of file left_right.py.

13.132.3.5 tuple rpki.left_right.repository_elt.elements = ("bpki_cert", "bpki_glue") [static]

XML elements contained by this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 770 of file left_right.py.

13.132.3.6 tuple rpki.left_right.repository_elt.handles = (("self", self_elt), ("bsc", bsc_elt)) [static]

Reimplemented from rpki.left_right.data_elt.

Definition at line 778 of file left_right.py.

13.132.3.7 tuple rpki.left_right.repository_elt.sql_template [static]

Initial value:

```
rpki.sql.template("repository", "repository_id", "repository_handle",
                                  "self_id", "bsc_id", "peer_contact_uri",
                                  ("bpki_cert", rpki.x509.X509),
                                  ("bpki_glue", rpki.x509.X509),
                                  ("last_cms_timestamp", rpki.sundial.datetime))
```

Definition at line 772 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.133 rpki.left_right.sax_handler Class Reference

Inheritance diagram for rpki.left_right.sax_handler:

Collaboration diagram for rpki.left_right.sax_handler:

Static Public Attributes

- string name = "msg"
- pdu = msg
- string version = "1"

13.133.1 Detailed Description

```
SAX handler for Left-Right protocol.
```

Definition at line 1353 of file left_right.py.

13.133.2 Member Data Documentation

13.133.2.1 string rpki.left_right.sax_handler.name = "msg" [static]

Definition at line 1359 of file left_right.py.

13.133.2.2 rpki.left_right.sax_handler.pdu = msg [static]

Reimplemented in irbe_cli.left_right_sax_handler.

Definition at line 1358 of file left_right.py.

13.133.2.3 string rpki.left_right.sax_handler.version = "1" [static]

Definition at line 1360 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.134 rpki.left_right.self_elt Class Reference

Inheritance diagram for rpki.left_right.self_elt:

Collaboration diagram for rpki.left_right.self_elt:

Public Member Functions

- def bscs
- def children
- def client_poll
- def cron
- def ghostbusters
- def parents
- def regenerate_crls_and_manifests
- def repositories
- def roas
- def serve_fetch_all
- def serve_fetch_handle
- def serve_fetch_one_maybe
- def serve_post_save_hook
- def serve_publish_world_now
- def serve_reissue
- def serve_rekey
- def serve_revoke
- def serve_revoke_forgotten
- def serve_run_now
- def update_children
- def update_ghostbusters
- def update_roas

Static Public Attributes

- tuple attributes = ("action", "tag", "self_handle", "crl_interval", "regen_margin")

  XML attributes for this element.

- tuple booleans = ("rekey", "reissue", "revoke", "run_now", "publish_world_-now", "revoke_forgotten")

  Boolean attributes (value "yes" or "no") for this element.

- bpki_cert = None
- bpki_glue = None
- crl_interval = None
- string element_name = "self"
- tuple elements = ("bpki_cert", "bpki_glue")

  XML elements contained by this element.

- tuple handles = ()

- regen_margin = None
- tuple sql_template
- use_hsm = False

13.134.1 Detailed Description

```
<self/> element.
```

Definition at line 130 of file left_right.py.

13.134.2 Member Function Documentation

13.134.2.1 def rpki.left_right.self_elt.bscs (*self*)

```
Fetch all BSC objects that link to this self object.
```

Definition at line 152 of file left_right.py.

13.134.2.2 def rpki.left_right.self_elt.children (*self*)

```
Fetch all child objects that link to this self object.
```

Definition at line 173 of file left_right.py.

13.134.2.3 def rpki.left_right.self_elt.client_poll (*self, callback*)

```
Run the regular client poll cycle with each of this self's parents
in turn.
```

Definition at line 346 of file left_right.py.

13.134.2.4 def rpki.left_right.self_elt.cron (*self, cb*)

```
Periodic tasks.
```

Definition at line 313 of file left_right.py.

13.134.2.5 def rpki.left_right.self_elt.ghostbusters (*self*)

```
Fetch all Ghostbuster record objects that link to this self object.
```

Definition at line 187 of file left_right.py.

13.134.2.6 def rpki.left_right.self_elt.parents (*self*)

```
Fetch all parent objects that link to this self object.
```

Definition at line 166 of file left_right.py.

13.134.2.7 def rpki.left_right.self_elt.regenerate_crls_and_manifests (*self, cb*)

```
Generate new CRLs and manifests as necessary for all of this
self's CAs.  Extracting nextUpdate from a manifest is hard at the
moment due to implementation silliness, so for now we generate a
new manifest whenever we generate a new CRL

This method also cleans up tombstones left behind by revoked
ca_detail objects, since we're walking through the relevant
portions of the database anyway.
```

Definition at line 484 of file left_right.py.

13.134.2.8 def rpki.left_right.self_elt.repositories (*self*)

```
Fetch all repository objects that link to this self object.
```

Definition at line 159 of file left_right.py.

13.134.2.9 def rpki.left_right.self_elt.roas (*self*)

```
Fetch all ROA objects that link to this self object.
```

Definition at line 180 of file left_right.py.

13.134.2.10 def rpki.left_right.self_elt.serve_fetch_all (*self*)

```
Find the self objects upon which a list action should operate.
This is different from the list action for all other objects,
where list only works within a given self_id context.
```

Reimplemented from rpki.left_right.data_elt.

Definition at line 305 of file left_right.py.

13.134.2.11 def rpki.left_right.self_elt.serve_fetch_handle (*cls, gctx, self_id, self_handle*)

```
Find a self object based on its self_handle.
```

Reimplemented from rpki.left_right.data_elt.

Definition at line 299 of file left_right.py.

13.134.2.12 def rpki.left_right.self_elt.serve_fetch_one_maybe (*self*)

```
Find the self object upon which a get, set, or destroy action
should operate, or which would conflict with a create method.
```

Reimplemented from rpki.left_right.data_elt.

Definition at line 291 of file left_right.py.

13.134.2.13 def rpki.left_right.self_elt.serve_post_save_hook (*self, q_pdu, r_pdu, cb, eb*)

```
Extra server actions for self_elt.
```

Reimplemented from rpki.xml_utils.data_elt.

Definition at line 193 of file left_right.py.

13.134.2.14 def rpki.left_right.self_elt.serve_publish_world_now (*self, cb, eb*)

```
Handle a left-right publish_world_now action for this self.

The publication stuff needs refactoring, right now publication is
interleaved with local operations in a way that forces far too
many bounces through the task system for any complex update.  The
whole thing ought to be rewritten to queue up outgoing publication
PDUs and only send them when we're all done or when we need to
force publication at a particular point in a multi-phase operation.

Once that reorganization has been done, this method should be
rewritten to reuse the low-level publish() methods that each
object will have...but we're not there yet.  So, for now, we just
do this via brute force.  Think of it as a trial version to see
whether we've identified everything that needs to be republished
for this operation.
```

Definition at line 251 of file left_right.py.

13.134.2.15 def rpki.left_right.self_elt.serve_reissue (*self, cb, eb*)

```
Handle a left-right reissue action for this self.
```

Definition at line 233 of file left_right.py.

13.134.2.16 def rpki.left_right.self_elt.serve_rekey (*self, cb, eb*)

```
Handle a left-right rekey action for this self.
```

Definition at line 215 of file left_right.py.

13.134.2.17 def rpki.left_right.self_elt.serve_revoke (*self, cb, eb*)

```
Handle a left-right revoke action for this self.
```

Definition at line 224 of file left_right.py.

13.134.2.18 def rpki.left_right.self_elt.serve_revoke_forgotten (*self, cb, eb*)

```
Handle a left-right revoke_forgotten action for this self.
```

Definition at line 242 of file left_right.py.

13.134.2.19 def rpki.left_right.self_elt.serve_run_now (*self, cb, eb*)

```
Handle a left-right run_now action for this self.
```

Definition at line 284 of file left_right.py.

13.134.2.20 def rpki.left_right.self_elt.update_children (*self, cb*)

```
Check for updated IRDB data for all of this self's children and
issue new certs as necessary.  Must handle changes both in
resources and in expiration date.
```

Definition at line 405 of file left_right.py.

13.134.2.21 def rpki.left_right.self_elt.update_ghostbusters (*self, cb*)

```
Generate or update Ghostbuster records for this self.

This is heavily based on .update_roas(), and probably both of them
need refactoring.
```

Definition at line 528 of file left_right.py.

13.134.2.22 def rpki.left_right.self_elt.update_roas (*self, cb*)

```
Generate or update ROAs for this self.
```

Definition at line 618 of file left_right.py.

13.134.3 Member Data Documentation

13.134.3.1 tuple rpki.left_right.self_elt.attributes = ("action", "tag", "self_handle", "crl_interval", "regen_margin") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 136 of file left_right.py.

13.134.3.2 tuple rpki.left_right.self_elt.booleans = ("rekey", "reissue", "revoke", "run_now", "publish_world_now", "revoke_forgotten") [static]

Boolean attributes (value "yes" or "no") for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 138 of file left_right.py.

13.134.3.3 rpki.left_right.self_elt.bpki_cert = None [static]

Definition at line 148 of file left_right.py.

13.134.3.4 rpki.left_right.self_elt.bpki_glue = None [static]

Definition at line 149 of file left_right.py.

13.134.3.5 rpki.left_right.self_elt.crl_interval = None [static]

Definition at line 146 of file left_right.py.

13.134.3.6 string rpki.left_right.self_elt.element_name = "self" [static]

Definition at line 135 of file left_right.py.

13.134.3.7 tuple rpki.left_right.self_elt.elements = ("bpki_cert", "bpki_glue") [static]

XML elements contained by this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 137 of file left_right.py.

13.134.3.8 tuple rpki.left_right.self_elt.handles = () [static]

Reimplemented from rpki.left_right.data_elt.

Definition at line 143 of file left_right.py.

13.134.3.9 rpki.left_right.self_elt.regen_margin = None [static]

Definition at line 147 of file left_right.py.

13.134.3.10 tuple rpki.left_right.self_elt.sql_template [static]

Initial value:

```
rpki.sql.template("self", "self_id", "self_handle",
                                  "use_hsm", "crl_interval", "regen_margin",
                                  ("bpki_cert", rpki.x509.X509), ("bpki_glue", r
      pki.x509.X509))
```

Definition at line 140 of file left_right.py.

13.134.3.11 rpki.left_right.self_elt.use_hsm = False [static]

Definition at line 145 of file left_right.py.

The documentation for this class was generated from the following file:

- left_right.py (3868)

13.135 rpki.log.logger Class Reference

Inheritance diagram for rpki.log.logger:

Collaboration diagram for rpki.log.logger:

Public Member Functions

- def __call__
- def __init__

Public Attributes

- priority

13.135.1 Detailed Description

```
Closure for logging.
```

Definition at line 76 of file log.py.

13.135.2 Constructor & Destructor Documentation

13.135.2.1 def rpki.log.logger.__init__ (*self, priority*)

Definition at line 81 of file log.py.

13.135.3 Member Function Documentation

13.135.3.1 def rpki.log.logger.__call__ (*self, message*)

Definition at line 84 of file log.py.

13.135.4 Member Data Documentation

13.135.4.1 rpki.log.logger.priority

Definition at line 81 of file log.py.

The documentation for this class was generated from the following file:

- log.py (3793)

13.136 rpki.manifest.FileAndHash Class Reference

Inheritance diagram for rpki.manifest.FileAndHash:

Collaboration diagram for rpki.manifest.FileAndHash:

Public Member Functions

- def __init__

Public Attributes

- file
- hash

13.136.1 Detailed Description

Definition at line 27 of file manifest.py.

13.136.2 Constructor & Destructor Documentation

13.136.2.1 def rpki.manifest.FileAndHash.__init__ (*self, optional = 0, default = ″*)

Definition at line 28 of file manifest.py.

13.136.3 Member Data Documentation

13.136.3.1 rpki.manifest.FileAndHash.file

Definition at line 28 of file manifest.py.

13.136.3.2 rpki.manifest.FileAndHash.hash

Definition at line 28 of file manifest.py.

The documentation for this class was generated from the following file:

- manifest.py (3598)

13.137 rpki.manifest.FilesAndHashes Class Reference

Inheritance diagram for rpki.manifest.FilesAndHashes:

Collaboration diagram for rpki.manifest.FilesAndHashes:

Public Member Functions

- def __init__

13.137.1 Detailed Description

Definition at line 34 of file manifest.py.

13.137.2 Constructor & Destructor Documentation

13.137.2.1 def rpki.manifest.FilesAndHashes.__init__ (*self, optional = 0, default = ″*)

Definition at line 35 of file manifest.py.

The documentation for this class was generated from the following file:

- manifest.py (3598)

13.138 rpki.manifest.Manifest Class Reference

Inheritance diagram for rpki.manifest.Manifest:

Collaboration diagram for rpki.manifest.Manifest:

Public Member Functions

- def __init__

Public Attributes

- explicitVersion
- fileHashAlg
- fileList
- manifestNumber
- nextUpdate
- thisUpdate
- version

13.138.1 Detailed Description

Definition at line 38 of file manifest.py.

13.138.2 Constructor & Destructor Documentation

13.138.2.1 def rpki.manifest.Manifest.__init__ (*self, optional = 0, default = ″*)

Definition at line 39 of file manifest.py.

13.138.3 Member Data Documentation

13.138.3.1 rpki.manifest.Manifest.explicitVersion

Definition at line 39 of file manifest.py.

13.138.3.2 rpki.manifest.Manifest.fileHashAlg

Definition at line 39 of file manifest.py.

13.138.3.3 rpki.manifest.Manifest.fileList

Definition at line 39 of file manifest.py.

13.138.3.4 rpki.manifest.Manifest.manifestNumber

Definition at line 39 of file manifest.py.

13.138.3.5 rpki.manifest.Manifest.nextUpdate

Definition at line 39 of file manifest.py.

13.138.3.6 rpki.manifest.Manifest.thisUpdate

Definition at line 39 of file manifest.py.

13.138.3.7 rpki.manifest.Manifest.version

Definition at line 39 of file manifest.py.

The documentation for this class was generated from the following file:

- manifest.py (3598)

13.139 rpki.myrpki.CA Class Reference

Inheritance diagram for rpki.myrpki.CA:

Collaboration diagram for rpki.myrpki.CA:

Public Member Functions

- def __init__
- def bsc
- def cms_xml_sign
- def cms_xml_verify
- def ee
- def fxcert
- def run_ca
- def run_dgst
- def run_openssl
- def run_req
- def setup
- def touch_file
- def xcert
- def xcert_filename
- def xcert_revoke

Public Attributes

- cer
- cfg
- crl
- crlnum
- dir
- env
- index
- key
- openssl
- req
- serial

Static Public Attributes

- dictionary path_restriction

13.139.1 Detailed Description

```
Representation of one certification authority.
```

Definition at line 573 of file myrpki.py.

13.139.2 Constructor & Destructor Documentation

13.139.2.1 def rpki.myrpki.CA.__init__ (*self, cfg_file, dir*)

Definition at line 584 of file myrpki.py.

13.139.3 Member Function Documentation

13.139.3.1 def rpki.myrpki.CA.bsc (*self, pkcs10*)

```
Issue BSC certificate, if we have a PKCS #10 request for it.
```

Definition at line 737 of file myrpki.py.

13.139.3.2 def rpki.myrpki.CA.cms_xml_sign (*self, ee_name, base_name, elt*)

```
Sign an XML object with CMS, return Base64 text.
```

Definition at line 699 of file myrpki.py.

13.139.3.3 def rpki.myrpki.CA.cms_xml_verify (*self, b64, ca*)

```
Attempt to verify and extract XML from a Base64-encoded signed CMS
object.  CA is the filename of a certificate that we expect to be
the issuer of the EE certificate bundled with the CMS, and must
previously have been cross-certified under our trust anchor.
```

Definition at line 712 of file myrpki.py.

13.139.3.4 def rpki.myrpki.CA.ee (*self, ee_name, base_name*)

```
Issue an end-enity certificate.
```

Definition at line 685 of file myrpki.py.

13.139.3.5 def rpki.myrpki.CA.fxcert (*self, b64, filename = None, path_restriction = 0*)

```
Write PEM certificate to file, then cross-certify.
```

Definition at line 758 of file myrpki.py.

13.139.3.6 def rpki.myrpki.CA.run_ca (*self, args*)

```
Run OpenSSL "ca" command with common initial arguments.
```

Definition at line 619 of file myrpki.py.

13.139.3.7 def rpki.myrpki.CA.run_dgst (*self, input, algorithm = "md5"*)

```
Run OpenSSL "dgst" command, return cleaned-up result.
```

Definition at line 636 of file myrpki.py.

13.139.3.8 def rpki.myrpki.CA.run_openssl (*self, cmd, kwargs*)

```
Run an OpenSSL command, suppresses stderr unless OpenSSL returns
failure, and returns stdout.
```

Definition at line 603 of file myrpki.py.

13.139.3.9 def rpki.myrpki.CA.run_req (*self, key_file, req_file, log_key = sys.stdout*)

```
Run OpenSSL "genrsa" and  "req" commands.
```

Definition at line 625 of file myrpki.py.

13.139.3.10 def rpki.myrpki.CA.setup (*self, ca_name*)

```
Set up this CA.  ca_name is an X.509 distinguished name in
/tag=val/tag=val format.
```

Definition at line 659 of file myrpki.py.

13.139.3.11 def rpki.myrpki.CA.touch_file (*filename, content* = `None`)

```
Create dumb little text files expected by OpenSSL "ca" utility.
```

Definition at line 649 of file myrpki.py.

13.139.3.12 def rpki.myrpki.CA.xcert (*self, cert, path_restriction* = `0`)

```
Cross-certify a certificate represented as a PEM file, if we
haven't already.  This only works for self-signed certs, due to
limitations of the OpenSSL command line tool, but that suffices
for our purposes.
```

Definition at line 785 of file myrpki.py.

13.139.3.13 def rpki.myrpki.CA.xcert_filename (*self, cert*)

```
Generate filename for a cross-certification.

Extracts public key and subject name from PEM file and hash it so
we can use the result as a tag for cross-certifying this cert.
```

Definition at line 771 of file myrpki.py.

13.139.3.14 def rpki.myrpki.CA.xcert_revoke (*self, cert*)

```
Revoke a cross-certification and regenerate CRL.
```

Definition at line 798 of file myrpki.py.

13.139.4 Member Data Documentation

13.139.4.1 rpki.myrpki.CA.cer

Definition at line 584 of file myrpki.py.

13.139.4.2 rpki.myrpki.CA.cfg

Definition at line 584 of file myrpki.py.

13.139.4.3 rpki.myrpki.CA.crl

Definition at line 584 of file myrpki.py.

13.139.4.4 rpki.myrpki.CA.crlnum

Definition at line 584 of file myrpki.py.

13.139.4.5 rpki.myrpki.CA.dir

Definition at line 584 of file myrpki.py.

13.139.4.6 rpki.myrpki.CA.env

Definition at line 584 of file myrpki.py.

13.139.4.7 rpki.myrpki.CA.index

Definition at line 584 of file myrpki.py.

13.139.4.8 rpki.myrpki.CA.key

Definition at line 584 of file myrpki.py.

13.139.4.9 rpki.myrpki.CA.openssl

Definition at line 584 of file myrpki.py.

13.139.4.10 dictionary rpki.myrpki.CA.path_restriction [static]

Initial value:

```
{ 0 : "ca_x509_ext_xcert0",
                        1 : "ca_x509_ext_xcert1" }
```

Definition at line 581 of file myrpki.py.

13.139.4.11 rpki.myrpki.CA.req

Definition at line 584 of file myrpki.py.

13.139.4.12 rpki.myrpki.CA.serial

Definition at line 584 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.140 rpki.myrpki.child Class Reference

Inheritance diagram for rpki.myrpki.child:

Collaboration diagram for rpki.myrpki.child:

Public Member Functions

- def __init__
- def __repr__
- def add
- def xml

Public Attributes

- asns
- bpki_certificate
- handle
- v4
- v6
- validity

Static Public Attributes

- tuple v4re = re.compile("^(([0-9]{1,3}\.){3}[0-9]{1,3}/[0-9]+)|(([0-9]{1,3}\.){3}[0-9]{1,3}-([0-9]{1,3}\.){3}[0-9]{1,3})$", re.I)
- tuple v6re = re.compile("^(([0-9a-f]{0,4}:){0,15}[0-9a-f]{0,4}/[0-9]+)|(([0-9a-f]{0,4}:){0,15}[0-9a-f]{0,4}-([0-9a-f]{0,4}:){0,15}[0-9a-f]{0,4})$", re.I)

13.140.1 Detailed Description

```
Representation of one child entity.
```

Definition at line 187 of file myrpki.py.

13.140.2 Constructor & Destructor Documentation

13.140.2.1 def rpki.myrpki.child.__init__ (*self, handle*)

Definition at line 195 of file myrpki.py.

13.140.3 Member Function Documentation

13.140.3.1 def rpki.myrpki.child.__repr__ (*self*)

Definition at line 203 of file myrpki.py.

13.140.3.2 def rpki.myrpki.child.add (*self, prefix* = `None`, *asn* = `None`, *validity* = `None`, *bpki_certificate* = `None`)

```
Add prefix, autonomous system number, validity date, or BPKI
certificate for this child.
```

Definition at line 217 of file myrpki.py.

13.140.3.3 def rpki.myrpki.child.xml (*self, e*)

```
Render this child as an XML element.
```

Definition at line 236 of file myrpki.py.

13.140.4 Member Data Documentation

13.140.4.1 rpki.myrpki.child.asns

Definition at line 195 of file myrpki.py.

13.140.4.2 rpki.myrpki.child.bpki_certificate

Definition at line 195 of file myrpki.py.

13.140.4.3 rpki.myrpki.child.handle

Definition at line 195 of file myrpki.py.

13.140.4.4 rpki.myrpki.child.v4

Definition at line 195 of file myrpki.py.

13.140.4.5 tuple rpki.myrpki.child.v4re = re.compile("^(([0-9]{1,3}\.){3}[0-9]{1,3}/[0-9]+)|(([0-9]{1,3}\.){3}[0-9]{1,3}-([0-9]{1,3}\.){3}[0-9]{1,3})$", re.I) `[static]`

Definition at line 192 of file myrpki.py.

13.140.4.6 rpki.myrpki.child.v6

Definition at line 195 of file myrpki.py.

13.140.4.7 tuple rpki.myrpki.child.v6re = re.compile("^(([0-9a-f]{0,4}:){0,15}[0-9a-f]{0,4}/[0-9]+)|(([0-9a-f]{0,4}:){0,15}[0-9a-f]{0,4}-([0-9a-f]{0,4}:){0,15}[0-9a-f]{0,4})$", re.I) [static]

Definition at line 193 of file myrpki.py.

13.140.4.8 rpki.myrpki.child.validity

Definition at line 195 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.141 rpki.myrpki.children Class Reference

Inheritance diagram for rpki.myrpki.children:

Collaboration diagram for rpki.myrpki.children:

Public Member Functions

- def add
- def from_entitydb
- def xml

13.141.1 Detailed Description

```
Database of children.
```

Definition at line 254 of file myrpki.py.

13.141.2 Member Function Documentation

13.141.2.1 def rpki.myrpki.children.add (*self, handle, prefix* = `None`, *asn* = `None`, *validity* = `None`, *bpki_certificate* = `None`)

```
Add resources to a child, creating the child object if necessary.
```

Definition at line 259 of file myrpki.py.

13.141.2.2 def rpki.myrpki.children.from_entitydb (*cls, prefix_csv_file, asn_csv_file, fxcert, entitydb*)

```
Parse child data from entitydb.
```

Definition at line 275 of file myrpki.py.

13.141.2.3 def rpki.myrpki.children.xml (*self, e*)

```
Render children database to XML.
```

Definition at line 267 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.142 rpki.myrpki.comma_set Class Reference

Inheritance diagram for rpki.myrpki.comma_set:

Collaboration diagram for rpki.myrpki.comma_set:

Public Member Functions

- def __str__

13.142.1 Detailed Description

```
Minor customization of set(), to provide a print syntax.
```

Definition at line 86 of file myrpki.py.

13.142.2 Member Function Documentation

13.142.2.1 def rpki.myrpki.comma_set.__str__ (*self*)

Definition at line 91 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.143 rpki.myrpki.csv_reader Class Reference

Inheritance diagram for rpki.myrpki.csv_reader:

Collaboration diagram for rpki.myrpki.csv_reader:

Public Member Functions

- def __init__
- def __iter__

Public Attributes

- columns
- comment_characters
- file
- filename
- min_columns

13.143.1 Detailed Description

```
Reader for tab-delimited text that's (slightly) friendlier than the
stock Python csv module (which isn't intended for direct use by
humans anyway, and neither was this package originally, but that
seems to be the way that it has evolved...).

Columns parameter specifies how many columns users of the reader
expect to see; lines with fewer columns will be padded with None
values.

Original API design for this class courtesy of Warren Kumari, but
don't blame him if you don't like what I did with his ideas.
```

Definition at line 475 of file myrpki.py.

13.143.2 Constructor & Destructor Documentation

13.143.2.1 def rpki.myrpki.csv_reader.__init__ (*self, filename, columns = None, min_columns = None, comment_characters = "#;"*)

Definition at line 490 of file myrpki.py.

13.143.3 Member Function Documentation

13.143.3.1 def rpki.myrpki.csv_reader.__iter__ (*self*)

Definition at line 501 of file myrpki.py.

13.143.4 Member Data Documentation

13.143.4.1 rpki.myrpki.csv_reader.columns

Definition at line 490 of file myrpki.py.

13.143.4.2 rpki.myrpki.csv_reader.comment_characters

Definition at line 490 of file myrpki.py.

13.143.4.3 rpki.myrpki.csv_reader.file

Definition at line 490 of file myrpki.py.

13.143.4.4 rpki.myrpki.csv_reader.filename

Definition at line 490 of file myrpki.py.

13.143.4.5 rpki.myrpki.csv_reader.min_columns

Definition at line 490 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.144 rpki.myrpki.csv_writer Class Reference

Inheritance diagram for rpki.myrpki.csv_writer:

Collaboration diagram for rpki.myrpki.csv_writer:

Public Member Functions

- def __getattr__
- def __init__
- def close

Public Attributes

- file
- filename
- renmwo
- writer

13.144.1 Detailed Description

```
Writer object for tab delimited text.  We just use the stock CSV
module in excel-tab mode for this.

If "renmwo" is set (default), the file will be written to
a temporary name and renamed to the real filename after closing.
```

Definition at line 517 of file myrpki.py.

13.144.2 Constructor & Destructor Documentation

13.144.2.1 def rpki.myrpki.csv_writer.__init__ (*self, filename, renmwo* = ***True***)

Definition at line 526 of file myrpki.py.

13.144.3 Member Function Documentation

13.144.3.1 def rpki.myrpki.csv_writer.__getattr__ (*self, attr*)

```
Fake inheritance from whatever object csv.writer deigns to give us.
```

Definition at line 542 of file myrpki.py.

13.144.3.2 def rpki.myrpki.csv_writer.close (*self*)

```
Close this writer.
```

Definition at line 532 of file myrpki.py.

13.144.4 Member Data Documentation

13.144.4.1 rpki.myrpki.csv_writer.file

Definition at line 526 of file myrpki.py.

13.144.4.2 rpki.myrpki.csv_writer.filename

Definition at line 526 of file myrpki.py.

13.144.4.3 rpki.myrpki.csv_writer.renmwo

Definition at line 526 of file myrpki.py.

13.144.4.4 rpki.myrpki.csv_writer.writer

Definition at line 526 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.145 rpki.myrpki.EntityDB Class Reference

Inheritance diagram for rpki.myrpki.EntityDB:

Collaboration diagram for rpki.myrpki.EntityDB:

Public Member Functions

- def __call__
- def __init__
- def iterate

Public Attributes

- dir
- identity

13.145.1 Detailed Description

```
Wrapper for entitydb path lookups and iterations.
```

Definition at line 94 of file myrpki.py.

13.145.2 Constructor & Destructor Documentation

13.145.2.1 def rpki.myrpki.EntityDB.__init__ (*self, cfg*)

Definition at line 99 of file myrpki.py.

13.145.3 Member Function Documentation

13.145.3.1 def rpki.myrpki.EntityDB.__call__ (*self, dirname, filebase* = `None`)

Definition at line 103 of file myrpki.py.

13.145.3.2 def rpki.myrpki.EntityDB.iterate (*self, dir, base* = `"*"`)

Definition at line 109 of file myrpki.py.

13.145.4 Member Data Documentation

13.145.4.1 rpki.myrpki.EntityDB.dir

Definition at line 99 of file myrpki.py.

13.145.4.2 rpki.myrpki.EntityDB.identity

Definition at line 99 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.146 rpki.myrpki.IRDB Class Reference

Inheritance diagram for rpki.myrpki.IRDB:

Collaboration diagram for rpki.myrpki.IRDB:

Public Member Functions

- def __init__
- def close
- def update

Public Attributes

- db

13.146.1 Detailed Description

```
Front-end to the IRDB.  This is broken out from class main so
that other applications (namely, the portal-gui) can reuse it.
```

Definition at line 891 of file myrpki.py.

13.146.2 Constructor & Destructor Documentation

13.146.2.1 def rpki.myrpki.IRDB.__init__ (*self, cfg*)

```
Opens a new connection to the IRDB, using the configuration
information from a rpki.config.parser object.
```

Definition at line 896 of file myrpki.py.

13.146.3 Member Function Documentation

13.146.3.1 def rpki.myrpki.IRDB.close (*self*)

```
Close the connection to the IRDB.
```

Definition at line 1000 of file myrpki.py.

13.146.3.2 def rpki.myrpki.IRDB.update (*self, handle, roa_requests, children, ghostbusters* = `None`)

```
Update the IRDB for a given resource handle.  Removes all
existing data and replaces it with that specified in the
argument list.

The "roa_requests" argument is a sequence of tuples of the form
(asID, v4_addresses, v6_addresses), where "v*_addresses" are
instances of rpki.resource_set.roa_prefix_set_ipv*.

The "children" argument is a sequence of tuples of the form
(child_handle, asns, v4addrs, v6addrs, valid_until),
where "asns" is an instance of rpki.resource_set.resource_set_asn,
"v*addrs" are instances of rpki.resource_set.resource_set_ipv*,
and "valid_until" is an instance of rpki.sundial.datetime.

The "ghostbusters" argument is a sequence of tuples of the form
(parent_handle, vcard_string).  "parent_handle" may be value None,
in which case the specified vcard object will be used for all
parents.
```

Definition at line 915 of file myrpki.py.

13.146.4 Member Data Documentation

13.146.4.1 rpki.myrpki.IRDB.db

Definition at line 899 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.147 rpki.myrpki.main Class Reference

Inheritance diagram for rpki.myrpki.main:

Collaboration diagram for rpki.myrpki.main:

Public Member Functions

- def __init__
- def complete_delete_child
- def complete_delete_parent
- def complete_delete_publication_client
- def complete_delete_repository
- def complete_renew_child
- def configure_resources_main
- def do_configure_child
- def do_configure_daemons
- def do_configure_parent
- def do_configure_publication_client
- def do_configure_repository
- def do_configure_resources
- def do_delete_child
- def do_delete_parent
- def do_delete_publication_client
- def do_delete_repository
- def do_initialize
- def do_renew_all_children
- def do_renew_child
- def do_update_bpki
- def entitydb_complete
- def help_overview
- def read_config
- def renew_children_common

Public Attributes

- bpki_resources
- bpki_servers
- cfg
- cfg_file
- default_repository
- entitydb
- handle
- histfile
- pubd_contact_info
- rsync_module
- rsync_server
- run_pubd
- run_rootd
- run_rpkid

Static Public Attributes

- completedefault = rpki.cli.Cmd.filename_complete
- string prompt = "myrpki> "
- show_xml = False

13.147.1 Detailed Description

Definition at line 1008 of file myrpki.py.

13.147.2 Constructor & Destructor Documentation

13.147.2.1 def rpki.myrpki.main.__init__ (*self*)

Definition at line 1016 of file myrpki.py.

13.147.3 Member Function Documentation

13.147.3.1 def rpki.myrpki.main.complete_delete_child (*self, args*)

Definition at line 1303 of file myrpki.py.

13.147.3.2 def rpki.myrpki.main.complete_delete_parent (*self, args*)

Definition at line 1366 of file myrpki.py.

13.147.3.3 def rpki.myrpki.main.complete_delete_publication_client (*self, args*)

Definition at line 1469 of file myrpki.py.

13.147.3.4 def rpki.myrpki.main.complete_delete_repository (*self, args*)

Definition at line 1517 of file myrpki.py.

13.147.3.5 def rpki.myrpki.main.complete_renew_child (*self, args*)

Definition at line 1562 of file myrpki.py.

13.147.3.6 def rpki.myrpki.main.configure_resources_main (*self, msg = None*)

```
Main program of old myrpki.py script.  This remains separate
because it's called from more than one place.
```

Definition at line 1574 of file myrpki.py.

13.147.3.7 def rpki.myrpki.main.do_configure_child (*self, arg*)

```
Configure a new child of this RPKI entity, given the child's XML
identity file as an input.  This command extracts the child's data
from the XML, cross-certifies the child's resource-holding BPKI
certificate, and generates an XML file describing the relationship
between the child and this parent, including this parent's BPKI
data and up-down protocol service URI.
```

Definition at line 1207 of file myrpki.py.

13.147.3.8 def rpki.myrpki.main.do_configure_daemons (*self, arg*)

```
Configure RPKI daemons with the data built up by the other
commands in this program.

The basic model here is that each entity with resources to certify
runs the myrpki tool, but not all of them necessarily run their
own RPKI engines.  The entities that do run RPKI engines get data
from the entities they host via the XML files output by the
configure_resources command.  Those XML files are the input to
this command, which uses them to do all the work of configuring
daemons, populating SQL databases, and so forth.  A few operations
(eg, BSC construction) generate data which has to be shipped back
to the resource holder, which we do by updating the same XML file.

In essence, the XML files are a sneakernet (or email, or carrier
pigeon) communication channel between the resource holders and the
RPKI engine operators.
```

```
As a convenience, for the normal case where the RPKI engine
operator is itself a resource holder, this command in effect runs
the configure_resources command automatically to process the RPKI
engine operator's own resources.

Note that, due to the back and forth nature of some of these
operations, it may take several cycles for data structures to stablize
and everything to reach a steady state.  This is normal.
```

Definition at line 1642 of file myrpki.py.

13.147.3.9 def rpki.myrpki.main.do_configure_parent (*self, arg*)

```
Configure a new parent of this RPKI entity, given the output of
the parent's configure_child command as input.  This command reads
the parent's response XML, extracts the parent's BPKI and service
URI information, cross-certifies the parent's BPKI data into this
entity's BPKI, and checks for offers or referrals of publication
service.  If a publication offer or referral is present, we
generate a request-for-service message to that repository, in case
the user wants to avail herself of the referral or offer.
```

Definition at line 1307 of file myrpki.py.

13.147.3.10 def rpki.myrpki.main.do_configure_publication_client (*self, arg*)

```
Configure publication server to know about a new client, given the
client's request-for-service message as input.  This command reads
the client's request for service, cross-certifies the client's
BPKI data, and generates a response message containing the
repository's BPKI data and service URI.
```

Definition at line 1370 of file myrpki.py.

13.147.3.11 def rpki.myrpki.main.do_configure_repository (*self, arg*)

```
Configure a publication repository for this RPKI entity, given the
repository's response to our request-for-service message as input.
This command reads the repository's response, extracts and
cross-certifies the BPKI data and service URI, and links the
repository data with the corresponding parent data in our local
database.
```

Definition at line 1473 of file myrpki.py.

13.147.3.12 def rpki.myrpki.main.do_configure_resources (*self, arg*)

```
Read CSV files and all the descriptions of parents and children
that we've built up, package the result up as a single XML file to
be shipped to a hosting rpkid.
```

Definition at line 1629 of file myrpki.py.

13.147.3.13 def rpki.myrpki.main.do_delete_child (*self, arg*)

```
Delete a child of this RPKI entity.

This should check that the XML file it's deleting really is a
child, but doesn't, yet.
```

Definition at line 1290 of file myrpki.py.

13.147.3.14 def rpki.myrpki.main.do_delete_parent (*self, arg*)

```
Delete a parent of this RPKI entity.

This should check that the XML file it's deleting really is a
parent, but doesn't, yet.
```

Definition at line 1353 of file myrpki.py.

13.147.3.15 def rpki.myrpki.main.do_delete_publication_client (*self, arg*)

```
Delete a publication client of this RPKI entity.

This should check that the XML file it's deleting really is a
client, but doesn't, yet.
```

Definition at line 1456 of file myrpki.py.

13.147.3.16 def rpki.myrpki.main.do_delete_repository (*self, arg*)

```
Delete a repository of this RPKI entity.

This should check that the XML file it's deleting really is a
repository, but doesn't, yet.
```

Definition at line 1504 of file myrpki.py.

13.147.3.17 def rpki.myrpki.main.do_initialize (*self, arg*)

```
Initialize an RPKI installation.  This command reads the
configuration file, creates the BPKI and EntityDB directories,
generates the initial BPKI certificates, and creates an XML file
describing the resource-holding aspect of this RPKI installation.
```

Definition at line 1084 of file myrpki.py.

13.147.3.18 def rpki.myrpki.main.do_renew_all_children (*self, arg*)

```
Update validity period for all child entities.
```

Definition at line 1565 of file myrpki.py.

13.147.3.19 def rpki.myrpki.main.do_renew_child (*self, arg*)

```
Update validity period for one child entity.
```

Definition at line 1556 of file myrpki.py.

13.147.3.20 def rpki.myrpki.main.do_update_bpki (*self, arg*)

```
Update BPKI certificates.  Assumes an existing RPKI installation.

Basic plan here is to reissue all BPKI certificates we can, right
now.  In the long run we might want to be more clever about only
touching ones that need maintenance, but this will do for a start.

Most likely this should be run under cron.
```

Definition at line 1166 of file myrpki.py.

13.147.3.21 def rpki.myrpki.main.entitydb_complete (*self, prefix, text, line, begidx, endidx*)

```
Completion helper for entitydb filenames.
```

Definition at line 1048 of file myrpki.py.

13.147.3.22 def rpki.myrpki.main.help_overview (*self*)

```
Show program __doc__ string.  Perhaps there's some clever way to
do this using the textwrap module, but for now something simple
and crude will suffice.
```

Definition at line 1038 of file myrpki.py.

13.147.3.23 def rpki.myrpki.main.read_config (*self*)

Definition at line 1059 of file myrpki.py.

13.147.3.24 def rpki.myrpki.main.renew_children_common (*self, arg, plural*)

```
Common code for renew_child and renew_all_children commands.
```

Definition at line 1521 of file myrpki.py.

13.147.4 Member Data Documentation

13.147.4.1 rpki.myrpki.main.bpki_resources

Definition at line 1059 of file myrpki.py.

13.147.4.2 rpki.myrpki.main.bpki_servers

Definition at line 1059 of file myrpki.py.

13.147.4.3 rpki.myrpki.main.cfg

Definition at line 1059 of file myrpki.py.

13.147.4.4 rpki.myrpki.main.cfg_file

Definition at line 1016 of file myrpki.py.

13.147.4.5 rpki.myrpki.main.completedefault = rpki.cli.Cmd.filename_-complete [static]

Definition at line 1012 of file myrpki.py.

13.147.4.6 rpki.myrpki.main.default_repository

Definition at line 1059 of file myrpki.py.

13.147.4.7 rpki.myrpki.main.entitydb

Definition at line 1059 of file myrpki.py.

13.147.4.8 rpki.myrpki.main.handle

Definition at line 1059 of file myrpki.py.

13.147.4.9 rpki.myrpki.main.histfile

Reimplemented from rpki.cli.Cmd.

Definition at line 1059 of file myrpki.py.

13.147.4.10 string rpki.myrpki.main.prompt = "myrpki> " [static]

Definition at line 1010 of file myrpki.py.

13.147.4.11 rpki.myrpki.main.pubd_contact_info

Definition at line 1059 of file myrpki.py.

13.147.4.12 rpki.myrpki.main.rsync_module

Definition at line 1059 of file myrpki.py.

13.147.4.13 rpki.myrpki.main.rsync_server

Definition at line 1059 of file myrpki.py.

13.147.4.14 rpki.myrpki.main.run_pubd

Definition at line 1059 of file myrpki.py.

13.147.4.15 rpki.myrpki.main.run_rootd

Definition at line 1059 of file myrpki.py.

13.147.4.16 rpki.myrpki.main.run_rpkid

Definition at line 1059 of file myrpki.py.

13.147.4.17 rpki.myrpki.main.show_xml = False [static]

Definition at line 1014 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.148 rpki.myrpki.parent Class Reference

Inheritance diagram for rpki.myrpki.parent:

Collaboration diagram for rpki.myrpki.parent:

Public Member Functions

- def __init__
- def __repr__
- def add
- def xml

Public Attributes

- bpki_cms_certificate
- handle

- myhandle
- service_uri
- sia_base

13.148.1 Detailed Description

```
Representation of one parent entity.
```

Definition at line 293 of file myrpki.py.

13.148.2 Constructor & Destructor Documentation

13.148.2.1 def rpki.myrpki.parent.__init__ (*self, handle*)

Definition at line 298 of file myrpki.py.

13.148.3 Member Function Documentation

13.148.3.1 def rpki.myrpki.parent.__repr__ (*self*)

Definition at line 305 of file myrpki.py.

13.148.3.2 def rpki.myrpki.parent.add (*self, service_uri* = `None`, *bpki_cms_certificate* = `None`, *myhandle* = `None`, *sia_base* = `None`)

```
Add service URI or BPKI certificates to this parent object.
```

Definition at line 317 of file myrpki.py.

13.148.3.3 def rpki.myrpki.parent.xml (*self, e*)

```
Render this parent object to XML.
```

Definition at line 333 of file myrpki.py.

13.148.4 Member Data Documentation

13.148.4.1 rpki.myrpki.parent.bpki_cms_certificate

Definition at line 298 of file myrpki.py.

13.148.4.2 rpki.myrpki.parent.handle

Definition at line 298 of file myrpki.py.

13.148.4.3 rpki.myrpki.parent.myhandle

Definition at line 298 of file myrpki.py.

13.148.4.4 rpki.myrpki.parent.service_uri

Definition at line 298 of file myrpki.py.

13.148.4.5 rpki.myrpki.parent.sia_base

Definition at line 298 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.149 rpki.myrpki.parents Class Reference

Inheritance diagram for rpki.myrpki.parents:

Collaboration diagram for rpki.myrpki.parents:

Public Member Functions

- def add
- def from_entitydb
- def xml

13.149.1 Detailed Description

```
Database of parent objects.
```

Definition at line 350 of file myrpki.py.

13.149.2 Member Function Documentation

13.149.2.1 def rpki.myrpki.parents.add (*self, handle, service_uri* = `None`, *bpki_cms_certificate* = `None`, *myhandle* = `None`, *sia_base* = `None`)

```
Add service URI or certificates to parent object, creating it if necessary.
```

Definition at line 355 of file myrpki.py.

13.149.2.2 def rpki.myrpki.parents.from_entitydb (*cls, fxcert, entitydb*)

```
Parse parent data from entitydb.
```

Definition at line 375 of file myrpki.py.

13.149.2.3 def rpki.myrpki.parents.xml (*self, e*)

Definition at line 370 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.150 rpki.myrpki.repositories Class Reference

Inheritance diagram for rpki.myrpki.repositories:

Collaboration diagram for rpki.myrpki.repositories:

Public Member Functions

- def add
- def from_entitydb
- def xml

13.150.1 Detailed Description

```
Database of repository objects.
```

Definition at line 437 of file myrpki.py.

13.150.2 Member Function Documentation

13.150.2.1 def rpki.myrpki.repositories.add (*self, handle, service_uri = None, bpki_certificate = None*)

```
Add service URI or certificate to repository object, creating it if necessary.
```

Definition at line 442 of file myrpki.py.

13.150.2.2 def rpki.myrpki.repositories.from_entitydb (*cls, fxcert, entitydb*)

```
Parse repository data from entitydb.
```

Definition at line 458 of file myrpki.py.

13.150.2.3 def rpki.myrpki.repositories.xml (*self, e*)

Definition at line 453 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.151 rpki.myrpki.repository Class Reference

Inheritance diagram for rpki.myrpki.repository:

Collaboration diagram for rpki.myrpki.repository:

Public Member Functions

- def __init__
- def __repr__
- def add
- def xml

Public Attributes

- bpki_certificate
- handle
- service_uri

13.151.1 Detailed Description

```
Representation of one repository entity.
```

Definition at line 395 of file myrpki.py.

13.151.2 Constructor & Destructor Documentation

13.151.2.1 def rpki.myrpki.repository.__init__ (*self, handle*)

Definition at line 400 of file myrpki.py.

13.151.3 Member Function Documentation

13.151.3.1 def rpki.myrpki.repository.__repr__ (*self*)

Definition at line 405 of file myrpki.py.

13.151.3.2 def rpki.myrpki.repository.add (*self, service_uri* = `None`, *bpki_certificate* = `None`)

```
Add service URI or BPKI certificates to this repository object.
```

Definition at line 413 of file myrpki.py.

13.151.3.3 def rpki.myrpki.repository.xml (*self, e*)

```
Render this repository object to XML.
```

Definition at line 422 of file myrpki.py.

13.151.4 Member Data Documentation

13.151.4.1 rpki.myrpki.repository.bpki_certificate

Definition at line 400 of file myrpki.py.

13.151.4.2 rpki.myrpki.repository.handle

Definition at line 400 of file myrpki.py.

13.151.4.3 rpki.myrpki.repository.service_uri

Definition at line 400 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.152 rpki.myrpki.roa_request Class Reference

Inheritance diagram for rpki.myrpki.roa_request:

Collaboration diagram for rpki.myrpki.roa_request:

Public Member Functions

- def __init__
- def __repr__
- def add
- def xml

Public Attributes

- asn
- group
- v4
- v6

Static Public Attributes

- tuple v4re = re.compile("^([0-9]{1,3}\.){3}[0-9]{1,3}/[0-9]+(-[0-9]+)?$", re.I)
- tuple v6re = re.compile("^([0-9a-f]{0,4}:){0,15}[0-9a-f]{0,4}/[0-9]+(-[0-9]+)?$", re.I)

13.152.1 Detailed Description

```
Representation of a ROA request.
```

Definition at line 112 of file myrpki.py.

13.152.2 Constructor & Destructor Documentation

13.152.2.1 def rpki.myrpki.roa_request.__init__ (*self, asn, group*)

Definition at line 120 of file myrpki.py.

13.152.3 Member Function Documentation

13.152.3.1 def rpki.myrpki.roa_request.__repr__ (*self*)

Definition at line 126 of file myrpki.py.

13.152.3.2 def rpki.myrpki.roa_request.add (*self, prefix*)

```
Add one prefix to this ROA request.
```

Definition at line 134 of file myrpki.py.

13.152.3.3 def rpki.myrpki.roa_request.xml (*self, e*)

```
Generate XML element represeting representing this ROA request.
```

Definition at line 145 of file myrpki.py.

13.152.4 Member Data Documentation

13.152.4.1 rpki.myrpki.roa_request.asn

Definition at line 120 of file myrpki.py.

13.152.4.2 rpki.myrpki.roa_request.group

Definition at line 120 of file myrpki.py.

13.152.4.3 rpki.myrpki.roa_request.v4

Definition at line 120 of file myrpki.py.

13.152.4.4 tuple rpki.myrpki.roa_request.v4re = re.compile("^([0-9]{1,3}\.){3}[0-9]{1,3}/[0-9]+(-[0-9]+)?$", re.I) [static]

Definition at line 117 of file myrpki.py.

13.152.4.5 rpki.myrpki.roa_request.v6

Definition at line 120 of file myrpki.py.

13.152.4.6 tuple rpki.myrpki.roa_request.v6re = re.compile("^([0-9a-f]{0,4}:){0,15}[0-9a-f]{0,4}/[0-9]+(-[0-9]+)?$", re.I) [static]

Definition at line 118 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.153 rpki.myrpki.roa_requests Class Reference

Inheritance diagram for rpki.myrpki.roa_requests:

Collaboration diagram for rpki.myrpki.roa_requests:

Public Member Functions

- def add
- def from_csv
- def xml

13.153.1 Detailed Description

```
Database of ROA requests.
```

Definition at line 155 of file myrpki.py.

13.153.2 Member Function Documentation

13.153.2.1 def rpki.myrpki.roa_requests.add (*self, asn, group, prefix*)

```
Add one <ASN, group, prefix> set to ROA request database.
```

Definition at line 160 of file myrpki.py.

13.153.2.2 def rpki.myrpki.roa_requests.from_csv (*cls, roa_csv_file*)

```
Parse ROA requests from CSV file.
```

Definition at line 177 of file myrpki.py.

13.153.2.3 def rpki.myrpki.roa_requests.xml (*self, e*)

```
Render ROA requests as XML elements.
```

Definition at line 169 of file myrpki.py.

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.154 rpki.pubd.main Class Reference

Inheritance diagram for rpki.pubd.main:

Collaboration diagram for rpki.pubd.main:

Public Member Functions

- def __init__
- def client_handler
- def control_handler
- def handler_common
- def main

Public Attributes

- bpki_ta
- cfg
- cfg_file
- http_server_host
- http_server_port
- irbe_cert
- profile
- pubd_cert
- pubd_key
- publication_base
- publication_multimodule
- sql

Static Public Attributes

- tuple client_url_regexp = re.compile("/client/([-A-Z0-9_/]+)$", re.I)

13.154.1 Detailed Description

```
Main program for pubd.
```

Definition at line 44 of file rpki/pubd.py.

13.154.2 Constructor & Destructor Documentation

13.154.2.1 def rpki.pubd.main.__init__ (*self*)

Definition at line 49 of file rpki/pubd.py.

13.154.2.2 def rpki.pubd.main.main (*self*)

Definition at line 79 of file rpki/pubd.py.

13.154.3 Member Function Documentation

13.154.3.1 def rpki.pubd.main.client_handler (*self, query, path, cb*)

```
Process one PDU from a client.
```

Definition at line 141 of file rpki/pubd.py.

13.154.3.2 def rpki.pubd.main.control_handler (*self, query, path, cb*)

```
Process one PDU from the IRBE.
```

Definition at line 121 of file rpki/pubd.py.

13.154.3.3 def rpki.pubd.main.handler_common (*self, query, client, cb, certs, crl = None*)

```
Common PDU handler code.
```

Definition at line 108 of file rpki/pubd.py.

13.154.4 Member Data Documentation

13.154.4.1 rpki.pubd.main.bpki_ta

Definition at line 79 of file rpki/pubd.py.

13.154.4.2 rpki.pubd.main.cfg

Definition at line 79 of file rpki/pubd.py.

13.154.4.3 rpki.pubd.main.cfg_file

Definition at line 49 of file rpki/pubd.py.

13.154.4.4 tuple rpki.pubd.main.client_url_regexp = re.compile("/client/([-A-Z0-9_/]+)$", re.I) [static]

Definition at line 139 of file rpki/pubd.py.

13.154.4.5 rpki.pubd.main.http_server_host

Definition at line 79 of file rpki/pubd.py.

13.154.4.6 rpki.pubd.main.http_server_port

Definition at line 79 of file rpki/pubd.py.

13.154.4.7 rpki.pubd.main.irbe_cert

Definition at line 79 of file rpki/pubd.py.

13.154.4.8 rpki.pubd.main.profile

Definition at line 49 of file rpki/pubd.py.

13.154.4.9 rpki.pubd.main.pubd_cert

Definition at line 79 of file rpki/pubd.py.

13.154.4.10 rpki.pubd.main.pubd_key

Definition at line 79 of file rpki/pubd.py.

13.154.4.11 rpki.pubd.main.publication_base

Definition at line 79 of file rpki/pubd.py.

13.154.4.12 rpki.pubd.main.publication_multimodule

Definition at line 79 of file rpki/pubd.py.

13.154.4.13 rpki.pubd.main.sql

Definition at line 79 of file rpki/pubd.py.

The documentation for this class was generated from the following file:

- rpki/pubd.py (3793)

13.155 rpki.publication.certificate_elt Class Reference

Inheritance diagram for rpki.publication.certificate_elt:

Collaboration diagram for rpki.publication.certificate_elt:

Static Public Attributes

- string element_name = "certificate"
- payload_type = rpki.x509.X509

13.155.1 Detailed Description

```
<certificate/> element.
```

Definition at line 271 of file publication.py.

13.155.2 Member Data Documentation

13.155.2.1 string rpki.publication.certificate_elt.element_name = "certificate" [static]

Definition at line 276 of file publication.py.

13.155.2.2 rpki.publication.certificate_elt.payload_type = rpki.x509.X509 [static]

Reimplemented from rpki.publication.publication_object_elt.

Definition at line 277 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.156 rpki.publication.client_elt Class Reference

Inheritance diagram for rpki.publication.client_elt:

Collaboration diagram for rpki.publication.client_elt:

Public Member Functions

- def check_allowed_uri
- def serve_fetch_all
- def serve_fetch_one_maybe

Static Public Attributes

- tuple attributes = ("action", "tag", "client_handle", "base_uri")

  XML attributes for this element.

- base_uri = None
- bpki_cert = None
- bpki_glue = None
- string element_name = "client"
- tuple elements = ("bpki_cert", "bpki_glue")

  XML elements contained by this element.

- tuple sql_template

13.156.1 Detailed Description

```
<client/> element.
```

Definition at line 113 of file publication.py.

13.156.2 Member Function Documentation

13.156.2.1 def rpki.publication.client_elt.check_allowed_uri (*self, uri*)

Definition at line 144 of file publication.py.

13.156.2.2 def rpki.publication.client_elt.serve_fetch_all (*self*)

```
Find client objects on which a list method should operate.
```

Definition at line 138 of file publication.py.

13.156.2.3 def rpki.publication.client_elt.serve_fetch_one_maybe (*self*)

```
Find the client object on which a get, set, or destroy method
should operate, or which would conflict with a create method.
```

Definition at line 131 of file publication.py.

13.156.3 Member Data Documentation

13.156.3.1 tuple rpki.publication.client_elt.attributes = ("action", "tag", "client_handle", "base_uri") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 119 of file publication.py.

13.156.3.2 rpki.publication.client_elt.base_uri = None [static]

Definition at line 127 of file publication.py.

13.156.3.3 rpki.publication.client_elt.bpki_cert = None [static]

Definition at line 128 of file publication.py.

13.156.3.4 rpki.publication.client_elt.bpki_glue = None [static]

Definition at line 129 of file publication.py.

13.156.3.5 string rpki.publication.client_elt.element_name = "client" [static]

Definition at line 118 of file publication.py.

13.156.3.6 tuple rpki.publication.client_elt.elements = ("bpki_cert", "bpki_glue") [static]

XML elements contained by this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 120 of file publication.py.

13.156.3.7 tuple rpki.publication.client_elt.sql_template [static]

Initial value:

```
rpki.sql.template("client", "client_id", "client_handle", "base_uri",
                                  ("bpki_cert", rpki.x509.X509),
                                  ("bpki_glue", rpki.x509.X509),
                                  ("last_cms_timestamp", rpki.sundial.datetime))
```

Definition at line 122 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.157 rpki.publication.cms_msg Class Reference

Inheritance diagram for rpki.publication.cms_msg:

Collaboration diagram for rpki.publication.cms_msg:

Static Public Attributes

- string encoding = "us-ascii"
- saxify = sax_handler.saxify
- schema = rpki.relaxng.publication

13.157.1 Detailed Description

```
Class to hold a CMS-signed publication PDU.
```

Definition at line 409 of file publication.py.

13.157.2 Member Data Documentation

13.157.2.1 string rpki.publication.cms_msg.encoding = "us-ascii" [static]

Definition at line 414 of file publication.py.

13.157.2.2 rpki.publication.cms_msg.saxify = sax_handler.saxify [static]

Reimplemented in irbe_cli.publication_cms_msg.

Definition at line 416 of file publication.py.

13.157.2.3 rpki.publication.cms_msg.schema = rpki.relaxng.publication [static]

Definition at line 415 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.158 rpki.publication.config_elt Class Reference

Inheritance diagram for rpki.publication.config_elt:

Collaboration diagram for rpki.publication.config_elt:

Public Member Functions

- def fetch
- def serve_fetch_one_maybe
- def serve_set
- def startElement

Public Attributes

- config_id

Static Public Attributes

- tuple attributes = ("action", "tag")

  XML attributes for this element.

- string element_name = "config"
- tuple elements = ("bpki_crl",)

  XML elements contained by this element.

- tuple sql_template = rpki.sql.template("config", "config_id", ("bpki_crl", rpki.x509.CRL))
- int wired_in_config_id = 1

13.158.1 Detailed Description

```
<config/> element.  This is a little weird because there should
never be more than one row in the SQL config table, but we have to
put the BPKI CRL somewhere and SQL is the least bad place available.

So we reuse a lot of the SQL machinery, but we nail config_id at 1,
we don't expose it in the XML protocol, and we only support the get
and set actions.
```

Definition at line 61 of file publication.py.

13.158.2 Member Function Documentation

13.158.2.1 def rpki.publication.config_elt.fetch (*cls, gctx*)

```
Fetch the config object from SQL.  This requires special handling
because of the weird way we treat config_id.
```

Definition at line 89 of file publication.py.

13.158.2.2 def rpki.publication.config_elt.serve_fetch_one_maybe (*self*)

```
Find the config object on which a get or set method should
operate.
```

Definition at line 106 of file publication.py.

13.158.2.3 def rpki.publication.config_elt.serve_set (*self, r_msg, cb, eb*)

```
Handle a set action.  This requires special handling because
config doesn't support the create method.
```

Reimplemented from rpki.xml_utils.data_elt.

Definition at line 96 of file publication.py.

13.158.2.4 def rpki.publication.config_elt.startElement (*self, stack, name, attrs*)

```
StartElement() handler for config object.  This requires special
handling because of the weird way we treat config_id.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 80 of file publication.py.

13.158.3 Member Data Documentation

13.158.3.1 tuple rpki.publication.config_elt.attributes = ("action", "tag") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 72 of file publication.py.

13.158.3.2 rpki.publication.config_elt.config_id

Definition at line 83 of file publication.py.

13.158.3.3 string rpki.publication.config_elt.element_name = "config" [static]

Definition at line 73 of file publication.py.

13.158.3.4 tuple rpki.publication.config_elt.elements = ("bpki_crl",) [static]

XML elements contained by this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 74 of file publication.py.

13.158.3.5 tuple rpki.publication.config_elt.sql_template = rpki.sql.template("config", "config_id", ("bpki_crl", rpki.x509.CRL)) [static]

Definition at line 76 of file publication.py.

13.158.3.6 int rpki.publication.config_elt.wired_in_config_id = 1 [static]

Definition at line 78 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.159 rpki.publication.control_elt Class Reference

Inheritance diagram for rpki.publication.control_elt:

Collaboration diagram for rpki.publication.control_elt:

Public Member Functions

- def serve_dispatch

13.159.1 Detailed Description

```
Virtual class for control channel objects.
```

Definition at line 47 of file publication.py.

13.159.2 Member Function Documentation

13.159.2.1 def rpki.publication.control_elt.serve_dispatch (*self, r_msg, cb, eb*)

```
Action dispatch handler.  This needs special handling because we
need to make sure that this PDU arrived via the control channel.
```

Reimplemented from rpki.xml_utils.data_elt.

Definition at line 52 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.160 rpki.publication.crl_elt Class Reference

Inheritance diagram for rpki.publication.crl_elt:

Collaboration diagram for rpki.publication.crl_elt:

Static Public Attributes

- string element_name = "crl"
- payload_type = rpki.x509.CRL

13.160.1 Detailed Description

```
<crl/> element.
```

Definition at line 279 of file publication.py.

13.160.2 Member Data Documentation

13.160.2.1 string rpki.publication.crl_elt.element_name = "crl" [static]

Definition at line 284 of file publication.py.

13.160.2.2 rpki.publication.crl_elt.payload_type = rpki.x509.CRL [static]

Reimplemented from rpki.publication.publication_object_elt.

Definition at line 285 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.161 rpki.publication.ghostbuster_elt Class Reference

Inheritance diagram for rpki.publication.ghostbuster_elt:

Collaboration diagram for rpki.publication.ghostbuster_elt:

Static Public Attributes

- string element_name = "ghostbuster"
- payload_type = rpki.x509.Ghostbuster

13.161.1 Detailed Description

```
<ghostbuster/> element.
```

Definition at line 303 of file publication.py.

13.161.2 Member Data Documentation

13.161.2.1 string rpki.publication.ghostbuster_elt.element_name = "ghostbuster" [static]

Definition at line 308 of file publication.py.

13.161.2.2 rpki.publication.ghostbuster_elt.payload_type = rpki.x509.Ghostbuster [static]

Reimplemented from rpki.publication.publication_object_elt.

Definition at line 309 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.162 rpki.publication.manifest_elt Class Reference

Inheritance diagram for rpki.publication.manifest_elt:

Collaboration diagram for rpki.publication.manifest_elt:

Static Public Attributes

- string element_name = "manifest"
- payload_type = rpki.x509.SignedManifest

13.162.1 Detailed Description

```
<manifest/> element.
```

Definition at line 287 of file publication.py.

13.162.2 Member Data Documentation

13.162.2.1 string rpki.publication.manifest_elt.element_name = "manifest" [static]

Definition at line 292 of file publication.py.

13.162.2.2 rpki.publication.manifest_elt.payload_type = rpki.x509.SignedManifest [static]

Reimplemented from rpki.publication.publication_object_elt.

Definition at line 293 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.163 rpki.publication.msg Class Reference

Inheritance diagram for rpki.publication.msg:

Collaboration diagram for rpki.publication.msg:

Public Member Functions

- def serve_top_level

Static Public Attributes

- tuple pdus

  Dispatch table of PDUs for this protocol.

- int version = 1

  Protocol version.

13.163.1 Detailed Description

```
Publication PDU.
```

Definition at line 356 of file publication.py.

13.163.2 Member Function Documentation

13.163.2.1 def rpki.publication.msg.serve_top_level (*self, gctx, client, cb*)

```
Serve one msg PDU.
```

Definition at line 370 of file publication.py.

13.163.3 Member Data Documentation

13.163.3.1 rpki::publication.msg::pdus [static]

Initial value:

```
dict((x.element_name, x) for x in
              (config_elt, client_elt, certificate_elt, crl_elt, manifest_elt, ro
      a_elt, ghostbuster_elt, report_error_elt))
```

Dispatch table of PDUs for this protocol.

Reimplemented in irbe_cli.publication_msg.

Definition at line 367 of file publication.py.

13.163.3.2 rpki::publication.msg::version = 1 [static]

Protocol version.

Reimplemented from rpki.xml_utils.msg.

Definition at line 363 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.164 rpki.publication.publication_namespace Class Reference

Inheritance diagram for rpki.publication.publication_namespace:

Collaboration diagram for rpki.publication.publication_namespace:

Static Public Attributes

- dictionary nsmap = { None : xmlns }
- string xmlns = "http://www.hactrn.net/uris/rpki/publication-spec/"

13.164.1 Detailed Description

```
XML namespace parameters for publication protocol.
```

Definition at line 39 of file publication.py.

13.164.2 Member Data Documentation

13.164.2.1 dictionary rpki.publication.publication_namespace.nsmap = { None : xmlns } [static]

Definition at line 45 of file publication.py.

13.164.2.2 string rpki.publication.publication_namespace.xmlns = "http://www.hactrn.net/uris/rpki/publication-spec/" [static]

Definition at line 44 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.165 rpki.publication.publication_object_elt Class Reference

Inheritance diagram for rpki.publication.publication_object_elt:

Collaboration diagram for rpki.publication.publication_object_elt:

Public Member Functions

- def endElement
- def make_publish
- def make_withdraw
- def raise_if_error
- def serve_dispatch
- def serve_publish
- def serve_withdraw
- def toXML
- def uri_to_filename

Static Public Attributes

- tuple attributes = ("action", "tag", "client_handle", "uri")

  XML attributes for this element.

- payload = None
- payload_type = None

13.165.1 Detailed Description

```
Virtual class for publishable objects.  These have very similar
syntax, differences lie in underlying datatype and methods.  XML
methods are a little different from the pattern used for objects
that support the create/set/get/list/destroy actions, but
publishable objects don't go in SQL either so these classes would be
different in any case.
```

Definition at line 148 of file publication.py.

13.165.2 Member Function Documentation

13.165.2.1 def rpki.publication.publication_object_elt.endElement (*self, stack, name, text*)

```
Handle a publishable element element.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 162 of file publication.py.

13.165.2.2 def rpki.publication.publication_object_elt.make_publish (*cls, uri, obj, tag = None*)

```
Construct a publication PDU.
```

Definition at line 250 of file publication.py.

13.165.2.3 def rpki.publication.publication_object_elt.make_withdraw (*cls, uri, obj, tag = None*)

```
Construct a withdrawal PDU.
```

Definition at line 258 of file publication.py.

13.165.2.4 def rpki.publication.publication_object_elt.raise_if_error (*self*)

```
No-op, since this is not a <report_error/> PDU.
```

Definition at line 265 of file publication.py.

13.165.2.5 def rpki.publication.publication_object_elt.serve_dispatch (*self, r_msg, cb, eb*)

```
Action dispatch handler.
```

Definition at line 180 of file publication.py.

13.165.2.6 def rpki.publication.publication_object_elt.serve_publish (*self*)

```
Publish an object.
```

Definition at line 205 of file publication.py.

13.165.2.7 def rpki.publication.publication_object_elt.serve_withdraw (*self*)

```
Withdraw an object.
```

Definition at line 220 of file publication.py.

13.165.2.8 def rpki.publication.publication_object_elt.toXML (*self*)

```
Generate XML element for publishable object.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 171 of file publication.py.

13.165.2.9 def rpki.publication.publication_object_elt.uri_to_filename (*self*)

```
Convert a URI to a local filename.
```

Definition at line 234 of file publication.py.

13.165.3 Member Data Documentation

13.165.3.1 tuple rpki.publication.publication_object_elt.attributes = ("action", "tag", "client_handle", "uri") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 158 of file publication.py.

13.165.3.2 rpki.publication.publication_object_elt.payload = None [static]

Definition at line 160 of file publication.py.

13.165.3.3 rpki.publication.publication_object_elt.payload_type = None [static]

Reimplemented in rpki.publication.certificate_elt, rpki.publication.crl_elt, rpki.publication.manifest_-elt, rpki.publication.roa_elt, and rpki.publication.ghostbuster_elt.

Definition at line 159 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.166 rpki.publication.report_error_elt Class Reference

Inheritance diagram for rpki.publication.report_error_elt:

Collaboration diagram for rpki.publication.report_error_elt:

Public Member Functions

- def __str__
- def from_exception
- def raise_if_error

Public Attributes

- error_code
- tag

Static Public Attributes

- tuple attributes = ("tag", "error_code")

  XML attributes for this element.

- string element_name = "report_error"
- error_text = None
- string text_attribute = "error_text"

  Name of the class attribute that holds the text value.

13.166.1 Detailed Description

```
<report_error/> element.
```

Definition at line 315 of file publication.py.

13.166.2 Member Function Documentation

13.166.2.1 def rpki.publication.report_error_elt.__str__ (*self*)

```
Convert a base_elt object to string format.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 337 of file publication.py.

13.166.2.2 def rpki.publication.report_error_elt.from_exception (*cls, e, tag = None*)

```
Generate a <report_error/> element from an exception.
```

Definition at line 327 of file publication.py.

13.166.2.3 def rpki.publication.report_error_elt.raise_if_error (*self*)

```
Raise exception associated with this <report_error/> PDU.
```

Definition at line 346 of file publication.py.

13.166.3 Member Data Documentation

13.166.3.1 tuple rpki.publication.report_error_elt.attributes = ("tag", "error_code") [static]

XML attributes for this element.

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 321 of file publication.py.

13.166.3.2 string rpki.publication.report_error_elt.element_name = "report_error" [static]

Definition at line 320 of file publication.py.

13.166.3.3 rpki.publication.report_error_elt.error_code

Definition at line 329 of file publication.py.

13.166.3.4 rpki.publication.report_error_elt.error_text = None [static]

Definition at line 324 of file publication.py.

13.166.3.5 rpki.publication.report_error_elt.tag

Definition at line 329 of file publication.py.

13.166.3.6 string rpki.publication.report_error_elt.text_attribute = "error_text" [static]

Name of the class attribute that holds the text value.

Reimplemented from rpki.xml_utils.text_elt.

Definition at line 322 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.167 rpki.publication.roa_elt Class Reference

Inheritance diagram for rpki.publication.roa_elt:

Collaboration diagram for rpki.publication.roa_elt:

Static Public Attributes

- string element_name = "roa"
- payload_type = rpki.x509.ROA

13.167.1 Detailed Description

```
<roa/> element.
```

Definition at line 295 of file publication.py.

13.167.2 Member Data Documentation

13.167.2.1 string rpki.publication.roa_elt.element_name = "roa" [static]

Definition at line 300 of file publication.py.

13.167.2.2 rpki.publication.roa_elt.payload_type = rpki.x509.ROA [static]

Reimplemented from rpki.publication.publication_object_elt.

Definition at line 301 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.168 rpki.publication.sax_handler Class Reference

Inheritance diagram for rpki.publication.sax_handler:

Collaboration diagram for rpki.publication.sax_handler:

Static Public Attributes

- string name = "msg"
- pdu = msg
- string version = "1"

13.168.1 Detailed Description

```
SAX handler for publication protocol.
```

Definition at line 400 of file publication.py.

13.168.2 Member Data Documentation

13.168.2.1 string rpki.publication.sax_handler.name = "msg" [static]

Definition at line 406 of file publication.py.

13.168.2.2 rpki.publication.sax_handler.pdu = msg [static]

Reimplemented in irbe_cli.publication_sax_handler.

Definition at line 405 of file publication.py.

13.168.2.3 string rpki.publication.sax_handler.version = "1" [static]

Definition at line 407 of file publication.py.

The documentation for this class was generated from the following file:

- publication.py (3793)

13.169 rpki.rcynic.NotRsyncURI Class Reference

Inheritance diagram for rpki.rcynic.NotRsyncURI:

Collaboration diagram for rpki.rcynic.NotRsyncURI:

13.169.1 Detailed Description

```
URI is not an rsync URI.
```

Definition at line 31 of file rcynic.py.

The documentation for this class was generated from the following file:

- rcynic.py (3884)

13.170 rpki.rcynic.rcynic_certificate Class Reference

Inheritance diagram for rpki.rcynic.rcynic_certificate:

Collaboration diagram for rpki.rcynic.rcynic_certificate:

Public Member Functions

- def __init__
- def show

Public Attributes

- aia_uri
- aki
- is_ca
- issuer
- manifest_uri
- notAfter
- notBefore
- resources
- serial
- sia_directory_uri
- ski
- subject

Static Public Attributes

- obj_class = rpki.x509.X509

13.170.1 Detailed Description

```
A certificate from rcynic cache.
```

Definition at line 67 of file rcynic.py.

13.170.2 Constructor & Destructor Documentation

13.170.2.1 def rpki.rcynic.rcynic_certificate.__init__ (*self, filename, kwargs*)

Reimplemented from rpki.rcynic.rcynic_object.

Definition at line 74 of file rcynic.py.

13.170.3 Member Function Documentation

13.170.3.1 def rpki.rcynic.rcynic_certificate.show (*self*)

```
Print certificate attributes.
```

Reimplemented from rpki.rcynic.rcynic_object.

Definition at line 89 of file rcynic.py.

13.170.4 Member Data Documentation

13.170.4.1 rpki.rcynic.rcynic_certificate.aia_uri

Definition at line 74 of file rcynic.py.

13.170.4.2 rpki.rcynic.rcynic_certificate.aki

Definition at line 74 of file rcynic.py.

13.170.4.3 rpki.rcynic.rcynic_certificate.is_ca

Definition at line 74 of file rcynic.py.

13.170.4.4 rpki.rcynic.rcynic_certificate.issuer

Definition at line 74 of file rcynic.py.

13.170.4.5 rpki.rcynic.rcynic_certificate.manifest_uri

Definition at line 74 of file rcynic.py.

13.170.4.6 rpki.rcynic.rcynic_certificate.notAfter

Definition at line 74 of file rcynic.py.

13.170.4.7 rpki.rcynic.rcynic_certificate.notBefore

Definition at line 74 of file rcynic.py.

13.170.4.8 rpki.rcynic.rcynic_certificate.obj_class = rpki.x509.X509 [static]

Definition at line 72 of file rcynic.py.

13.170.4.9 rpki.rcynic.rcynic_certificate.resources

Definition at line 74 of file rcynic.py.

13.170.4.10 rpki.rcynic.rcynic_certificate.serial

Definition at line 74 of file rcynic.py.

13.170.4.11 rpki.rcynic.rcynic_certificate.sia_directory_uri

Definition at line 74 of file rcynic.py.

13.170.4.12 rpki.rcynic.rcynic_certificate.ski

Definition at line 74 of file rcynic.py.

13.170.4.13 rpki.rcynic.rcynic_certificate.subject

Definition at line 74 of file rcynic.py.

The documentation for this class was generated from the following file:

- rcynic.py (3884)

13.171 rpki.rcynic.rcynic_file_iterator Class Reference

Inheritance diagram for rpki.rcynic.rcynic_file_iterator:

Collaboration diagram for rpki.rcynic.rcynic_file_iterator:

Public Member Functions

- def __init__
- def __iter__

Public Attributes

- rcynic_dir

13.171.1 Detailed Description

```
Iterate over files in an rcynic output tree, yielding a Python
representation of each object found.
```

Definition at line 172 of file rcynic.py.

13.171.2 Constructor & Destructor Documentation

13.171.2.1 def rpki.rcynic.rcynic_file_iterator.__init__ (*self, rcynic_root, authenticated_subdir* = `"authenticated"`)

Definition at line 178 of file rcynic.py.

13.171.3 Member Function Documentation

13.171.3.1 def rpki.rcynic.rcynic_file_iterator.__iter__ (*self*)

Definition at line 182 of file rcynic.py.

13.171.4 Member Data Documentation

13.171.4.1 rpki.rcynic.rcynic_file_iterator.rcynic_dir

Definition at line 178 of file rcynic.py.

The documentation for this class was generated from the following file:

- rcynic.py (3884)

13.172 rpki.rcynic.rcynic_ghostbuster Class Reference

Inheritance diagram for rpki.rcynic.rcynic_ghostbuster:

Collaboration diagram for rpki.rcynic.rcynic_ghostbuster:

Public Member Functions

- def __init__
- def show

Public Attributes

- aia_uri
- aki
- ee
- issuer
- notAfter
- notBefore
- serial
- ski
- subject
- vcard

Static Public Attributes

- obj_class = rpki.x509.Ghostbuster

13.172.1 Detailed Description

```
Ghostbuster record from the rcynic cache.
```

Definition at line 142 of file rcynic.py.

13.172.2 Constructor & Destructor Documentation

13.172.2.1 def rpki.rcynic.rcynic_ghostbuster.__init__ (*self, args, kwargs*)

Reimplemented from rpki.rcynic.rcynic_object.

Definition at line 149 of file rcynic.py.

13.172.3 Member Function Documentation

13.172.3.1 def rpki.rcynic.rcynic_ghostbuster.show (*self*)

```
Print common object attributes.
```

Reimplemented from rpki.rcynic.rcynic_object.

Definition at line 163 of file rcynic.py.

13.172.4 Member Data Documentation

13.172.4.1 rpki.rcynic.rcynic_ghostbuster.aia_uri

Definition at line 149 of file rcynic.py.

13.172.4.2 rpki.rcynic.rcynic_ghostbuster.aki

Definition at line 149 of file rcynic.py.

13.172.4.3 rpki.rcynic.rcynic_ghostbuster.ee

Definition at line 149 of file rcynic.py.

13.172.4.4 rpki.rcynic.rcynic_ghostbuster.issuer

Definition at line 149 of file rcynic.py.

13.172.4.5 rpki.rcynic.rcynic_ghostbuster.notAfter

Definition at line 149 of file rcynic.py.

13.172.4.6 rpki.rcynic.rcynic_ghostbuster.notBefore

Definition at line 149 of file rcynic.py.

13.172.4.7 rpki.rcynic.rcynic_ghostbuster.obj_class = rpki.x509.Ghostbuster [static]

Definition at line 147 of file rcynic.py.

13.172.4.8 rpki.rcynic.rcynic_ghostbuster.serial

Definition at line 149 of file rcynic.py.

13.172.4.9 rpki.rcynic.rcynic_ghostbuster.ski

Definition at line 149 of file rcynic.py.

13.172.4.10 rpki.rcynic.rcynic_ghostbuster.subject

Definition at line 149 of file rcynic.py.

13.172.4.11 rpki.rcynic.rcynic_ghostbuster.vcard

Definition at line 149 of file rcynic.py.

The documentation for this class was generated from the following file:

- rcynic.py (3884)

13.173 rpki.rcynic.rcynic_object Class Reference

Inheritance diagram for rpki.rcynic.rcynic_object:

Collaboration diagram for rpki.rcynic.rcynic_object:

Public Member Functions

- def __init__
- def __repr__
- def show
- def show_attrs

Public Attributes

- filename
- obj

13.173.1 Detailed Description

```
An object read from rcynic cache.
```

Definition at line 36 of file rcynic.py.

13.173.2 Constructor & Destructor Documentation

13.173.2.1 def rpki.rcynic.rcynic_object.__init__ (*self, filename, kwargs*)

Reimplemented in rpki.rcynic.rcynic_certificate, rpki.rcynic.rcynic_roa, and rpki.rcynic.rcynic_-ghostbuster.

Definition at line 41 of file rcynic.py.

13.173.3 Member Function Documentation

13.173.3.1 def rpki.rcynic.rcynic_object.__repr__ (*self*)

Definition at line 47 of file rcynic.py.

13.173.3.2 def rpki.rcynic.rcynic_object.show (*self*)

```
Print common object attributes.
```

Reimplemented in rpki.rcynic.rcynic_certificate, rpki.rcynic.rcynic_roa, and rpki.rcynic.rcynic_-ghostbuster.

Definition at line 61 of file rcynic.py.

13.173.3.3 def rpki.rcynic.rcynic_object.show_attrs (*self, attrs*)

```
Print a bunch of object attributes, quietly ignoring any that
might be missing.
```

Definition at line 50 of file rcynic.py.

13.173.4 Member Data Documentation

13.173.4.1 rpki.rcynic.rcynic_object.filename

Definition at line 41 of file rcynic.py.

13.173.4.2 rpki.rcynic.rcynic_object.obj

Definition at line 41 of file rcynic.py.

The documentation for this class was generated from the following file:

- rcynic.py (3884)

13.174 rpki.rcynic.rcynic_roa Class Reference

Inheritance diagram for rpki.rcynic.rcynic_roa:

Collaboration diagram for rpki.rcynic.rcynic_roa:

Public Member Functions

- def __init__
- def show

Public Attributes

- aia_uri
- aki
- asID
- ee
- issuer
- notAfter
- notBefore
- prefix_sets
- resources
- serial
- ski
- subject

Static Public Attributes

- obj_class = rpki.x509.ROA

Static Private Attributes

- tuple _afi_map

13.174.1 Detailed Description

```
A ROA from rcynic cache.
```

Definition at line 96 of file rcynic.py.

13.174.2 Constructor & Destructor Documentation

13.174.2.1 def rpki.rcynic.rcynic_roa.__init__ (*self, filename, kwargs*)

Reimplemented from rpki.rcynic.rcynic_object.

Definition at line 107 of file rcynic.py.

13.174.3 Member Function Documentation

13.174.3.1 def rpki.rcynic.rcynic_roa.show (*self*)

```
Print ROA attributes.
```

Reimplemented from rpki.rcynic.rcynic_object.

Definition at line 133 of file rcynic.py.

13.174.4 Member Data Documentation

13.174.4.1 tuple rpki.rcynic.rcynic_roa._afi_map [static, private]

Initial value:

```
dict((cls.resource_set_type.afi, cls)
                 for cls in (rpki.resource_set.roa_prefix_set_ipv4,
                             rpki.resource_set.roa_prefix_set_ipv6))
```

Definition at line 103 of file rcynic.py.

13.174.4.2 rpki.rcynic.rcynic_roa.aia_uri

Definition at line 107 of file rcynic.py.

13.174.4.3 rpki.rcynic.rcynic_roa.aki

Definition at line 107 of file rcynic.py.

13.174.4.4 rpki.rcynic.rcynic_roa.asID

Definition at line 107 of file rcynic.py.

13.174.4.5 rpki.rcynic.rcynic_roa.ee

Definition at line 107 of file rcynic.py.

13.174.4.6 rpki.rcynic.rcynic_roa.issuer

Definition at line 107 of file rcynic.py.

13.174.4.7 rpki.rcynic.rcynic_roa.notAfter

Definition at line 107 of file rcynic.py.

13.174.4.8 rpki.rcynic.rcynic_roa.notBefore

Definition at line 107 of file rcynic.py.

13.174.4.9 rpki.rcynic.rcynic_roa.obj_class = rpki.x509.ROA [static]

Definition at line 101 of file rcynic.py.

13.174.4.10 rpki.rcynic.rcynic_roa.prefix_sets

Definition at line 107 of file rcynic.py.

13.174.4.11 rpki.rcynic.rcynic_roa.resources

Definition at line 107 of file rcynic.py.

13.174.4.12 rpki.rcynic.rcynic_roa.serial

Definition at line 107 of file rcynic.py.

13.174.4.13 rpki.rcynic.rcynic_roa.ski

Definition at line 107 of file rcynic.py.

13.174.4.14 rpki.rcynic.rcynic_roa.subject

Definition at line 107 of file rcynic.py.

The documentation for this class was generated from the following file:

- rcynic.py (3884)

13.175 rpki.rcynic.rcynic_xml_iterator Class Reference

Inheritance diagram for rpki.rcynic.rcynic_xml_iterator:

Collaboration diagram for rpki.rcynic.rcynic_xml_iterator:

Public Member Functions

- def __init__
- def __iter__
- def uri_to_filename

Public Attributes

- authenticated_old_subdir
- authenticated_subdir

- rcynic_root
- unauthenticated_subdir
- xml_file

Static Public Attributes

- string base_uri = "rsync://"

13.175.1 Detailed Description

```
Iterate over validation_status entries in the XML output from an
rcynic run.  Yields a tuple for each entry:

  URI, OK, status, timestamp, object

where URI, status, and timestamp are the corresponding values from
the XML element, OK is a boolean indicating whether validation was
considered succesful, and object is a Python representation of the
object in question.  If OK is True, object will be from rcynic's
authenticated output tree; otherwise, object will be from rcynic's
unauthenticated output tree.

Note that it is possible for the same URI to appear in more than one
validation_status element; in such cases, the succesful case (OK
True) should be the last entry (as rcynic will stop trying once it
gets a good copy), but there may be multiple failures, which might
or might not have different status codes.
```

Definition at line 190 of file rcynic.py.

13.175.2 Constructor & Destructor Documentation

13.175.2.1 def rpki.rcynic.rcynic_xml_iterator.__init__ (*self, rcynic_root, xml_file, authenticated_subdir = "authenticated", authenticated_old_subdir = "authenticated.old", unauthenticated_subdir = "unauthenticated"*)

Definition at line 211 of file rcynic.py.

13.175.3 Member Function Documentation

13.175.3.1 def rpki.rcynic.rcynic_xml_iterator.__iter__ (*self*)

Definition at line 229 of file rcynic.py.

13.175.3.2 def rpki.rcynic.rcynic_xml_iterator.uri_to_filename (*self, uri*)

Definition at line 223 of file rcynic.py.

13.175.4 Member Data Documentation

13.175.4.1 rpki.rcynic.rcynic_xml_iterator.authenticated_old_subdir

Definition at line 211 of file rcynic.py.

13.175.4.2 rpki.rcynic.rcynic_xml_iterator.authenticated_subdir

Definition at line 211 of file rcynic.py.

13.175.4.3 string rpki.rcynic.rcynic_xml_iterator.base_uri = "rsync://" [static]

Definition at line 221 of file rcynic.py.

13.175.4.4 rpki.rcynic.rcynic_xml_iterator.rcynic_root

Definition at line 211 of file rcynic.py.

13.175.4.5 rpki.rcynic.rcynic_xml_iterator.unauthenticated_subdir

Definition at line 211 of file rcynic.py.

13.175.4.6 rpki.rcynic.rcynic_xml_iterator.xml_file

Definition at line 211 of file rcynic.py.

The documentation for this class was generated from the following file:

- rcynic.py (3884)

13.176 rpki.rcynic.UnknownObject Class Reference

Inheritance diagram for rpki.rcynic.UnknownObject:

Collaboration diagram for rpki.rcynic.UnknownObject:

13.176.1 Detailed Description

```
Unrecognized object in rcynic result cache.
```

Definition at line 26 of file rcynic.py.

The documentation for this class was generated from the following file:

- rcynic.py (3884)

13.177 rpki.resource_set.resource_bag Class Reference

Inheritance diagram for rpki.resource_set.resource_bag:

Collaboration diagram for rpki.resource_set.resource_bag:

Public Member Functions

- def __eq__
- def __init__
- def __ne__

- def __str__
- def empty
- def from_inheritance
- def from_rfc3779_tuples
- def intersection
- def oversized
- def undersized
- def union

Public Attributes

- asn

  Set of Autonomous System Number resources.

- v4

  Set of IPv4 resources.

- v6

  Set of IPv6 resources.

- valid_until

  Expiration date of resources, for setting certificate notAfter field.

13.177.1 Detailed Description

```
Container to simplify passing around the usual triple of ASN, IPv4,
and IPv6 resource sets.
```

Definition at line 665 of file resource_set.py.

13.177.2 Constructor & Destructor Documentation

13.177.2.1 def rpki.resource_set.resource_bag.__init__ (*self*, *asn* = `None`, *v4* = `None`, *v6* = `None`, *valid_until* = `None`)

Definition at line 683 of file resource_set.py.

13.177.3 Member Function Documentation

13.177.3.1 def rpki.resource_set.resource_bag.__eq__ (*self, other*)

Definition at line 750 of file resource_set.py.

13.177.3.2 def rpki.resource_set.resource_bag.__ne__ (*self, other*)

Definition at line 756 of file resource_set.py.

13.177.3.3 def rpki.resource_set.resource_bag.__str__ (*self*)

Definition at line 779 of file resource_set.py.

13.177.3.4 def rpki.resource_set.resource_bag.empty (*self*)

```
True iff all resource sets in this bag are empty.
```

Definition at line 744 of file resource_set.py.

13.177.3.5 def rpki.resource_set.resource_bag.from_inheritance (*cls*)

```
Build a resource bag that just inherits everything from its
parent.
```

Definition at line 706 of file resource_set.py.

13.177.3.6 def rpki.resource_set.resource_bag.from_rfc3779_tuples (*cls, exts*)

```
Build a resource_bag from intermediate form generated by RFC 3779
ASN.1 decoder.
```

Definition at line 721 of file resource_set.py.

13.177.3.7 def rpki.resource_set.resource_bag.intersection (*self, other*)

```
Compute intersection with another resource_bag.  valid_until
attribute (if any) inherits from self.
```

Definition at line 759 of file resource_set.py.

13.177.3.8 def rpki.resource_set.resource_bag.oversized (*self, other*)

```
True iff self is oversized with respect to other.
```

Definition at line 689 of file resource_set.py.

13.177.3.9 def rpki.resource_set.resource_bag.undersized (*self, other*)

```
True iff self is undersized with respect to other.
```

Definition at line 697 of file resource_set.py.

13.177.3.10 def rpki.resource_set.resource_bag.union (*self, other*)

```
Compute union with another resource_bag.  valid_until attribute
(if any) inherits from self.
```

Definition at line 769 of file resource_set.py.

13.177.4 Member Data Documentation

13.177.4.1 rpki::resource_set.resource_bag::asn

Set of Autonomous System Number resources.

Definition at line 683 of file resource_set.py.

13.177.4.2 rpki::resource_set.resource_bag::v4

Set of IPv4 resources.

Definition at line 683 of file resource_set.py.

13.177.4.3 rpki::resource_set.resource_bag::v6

Set of IPv6 resources.

Definition at line 683 of file resource_set.py.

13.177.4.4 rpki::resource_set.resource_bag::valid_until

Expiration date of resources, for setting certificate notAfter field.

Definition at line 683 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.178 rpki.resource_set.resource_range Class Reference

Inheritance diagram for rpki.resource_set.resource_range:

Collaboration diagram for rpki.resource_set.resource_range:

Public Member Functions

- def __cmp__
- def __init__

Public Attributes

- max
- min

13.178.1 Detailed Description

```
Generic resource range type.  Assumes underlying type is some kind
of integer.

This is a virtual class.  You probably don't want to use this type
directly.
```

Definition at line 55 of file resource_set.py.

13.178.2 Constructor & Destructor Documentation

13.178.2.1 def rpki.resource_set.resource_range.__init__ (*self, min, max*)

```
Initialize and sanity check a resource_range.
```

Definition at line 64 of file resource_set.py.

13.178.3 Member Function Documentation

13.178.3.1 def rpki.resource_set.resource_range.__cmp__ (*self, other*)

```
Compare two resource_range objects.
```

Definition at line 73 of file resource_set.py.

13.178.4 Member Data Documentation

13.178.4.1 rpki.resource_set.resource_range.max

Definition at line 66 of file resource_set.py.

13.178.4.2 rpki.resource_set.resource_range.min

Reimplemented in rpki.resource_set.resource_range_as.

Definition at line 66 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.179 rpki.resource_set.resource_range_as Class Reference

Inheritance diagram for rpki.resource_set.resource_range_as:

Collaboration diagram for rpki.resource_set.resource_range_as:

Public Member Functions

- def __str__
- def from_strings

- def parse_str
- def to_rfc3779_tuple

Public Attributes

- min

Static Public Attributes

- datum_type = long

  Type of underlying data (min and max).

13.179.1 Detailed Description

```
Range of Autonomous System Numbers.

Denotes a single ASN by a range whose min and max values are
identical.
```

Definition at line 80 of file resource_set.py.

13.179.2 Member Function Documentation

13.179.2.1 def rpki.resource_set.resource_range_as.__str__ (*self*)

```
Convert a resource_range_as to string format.
```

Definition at line 93 of file resource_set.py.

13.179.2.2 def rpki.resource_set.resource_range_as.from_strings (*cls, a, b = None*)

```
Construct ASN range from strings.
```

Definition at line 123 of file resource_set.py.

13.179.2.3 def rpki.resource_set.resource_range_as.parse_str (*cls*, *x*)

```
Parse ASN resource range from text (eg, XML attributes).
```

Definition at line 112 of file resource_set.py.

13.179.2.4 def rpki.resource_set.resource_range_as.to_rfc3779_tuple (*self*)

```
Convert a resource_range_as to tuple format for RFC 3779 ASN.1 encoding.
```

Definition at line 102 of file resource_set.py.

13.179.3 Member Data Documentation

13.179.3.1 rpki::resource_set.resource_range_as::datum_type = long [static]

Type of underlying data (min and max).

Definition at line 91 of file resource_set.py.

13.179.3.2 rpki.resource_set.resource_range_as.min

Reimplemented from rpki.resource_set.resource_range.

Definition at line 95 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.180 rpki.resource_set.resource_range_ip Class Reference

Inheritance diagram for rpki.resource_set.resource_range_ip:

Collaboration diagram for rpki.resource_set.resource_range_ip:

Public Member Functions

- def __str__
- def chop_into_prefixes
- def from_strings
- def make_prefix
- def parse_str
- def prefixlen
- def to_rfc3779_tuple

Static Private Attributes

- _prefixlen = prefixlen

13.180.1 Detailed Description

```
Range of (generic) IP addresses.

Prefixes are converted to ranges on input, and ranges that can be
represented as prefixes are written as prefixes on output.

This is a virtual class.  You probably don't want to use it
directly.
```

Definition at line 131 of file resource_set.py.

13.180.2 Member Function Documentation

13.180.2.1 def rpki.resource_set.resource_range_ip.__str__ (*self*)

```
Convert a resource_range_ip to string format.
```

Definition at line 162 of file resource_set.py.

13.180.2.2 def rpki.resource_set.resource_range_ip.chop_into_prefixes (*self, result*)

```
Chop up a resource_range_ip into ranges that can be represented as
prefixes.
```

Definition at line 207 of file resource_set.py.

13.180.2.3 def rpki.resource_set.resource_range_ip.from_strings (*cls, a, b = None*)

```
Construct IP address range from strings.
```

Definition at line 231 of file resource_set.py.

13.180.2.4 def rpki.resource_set.resource_range_ip.make_prefix (*cls, prefix, prefixlen*)

```
Construct a resource range corresponding to a prefix.
```

Definition at line 197 of file resource_set.py.

13.180.2.5 def rpki.resource_set.resource_range_ip.parse_str (*cls, x*)

```
Parse IP address range or prefix from text (eg, XML attributes).
```

Definition at line 184 of file resource_set.py.

13.180.2.6 def rpki.resource_set.resource_range_ip.prefixlen (*self*)

```
Determine whether a resource_range_ip can be expressed as a
prefix.  Returns prefix length if it can, otherwise raises
MustBePrefix exception.
```

Definition at line 142 of file resource_set.py.

13.180.2.7 def rpki.resource_set.resource_range_ip.to_rfc3779_tuple (*self*)

```
Convert a resource_range_ip to tuple format for RFC 3779 ASN.1
encoding.
```

Definition at line 171 of file resource_set.py.

13.180.3 Member Data Documentation

13.180.3.1 rpki.resource_set.resource_range_ip._prefixlen = prefixlen [static, private]

Definition at line 160 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.181 rpki.resource_set.resource_range_ipv4 Class Reference

Inheritance diagram for rpki.resource_set.resource_range_ipv4:

Collaboration diagram for rpki.resource_set.resource_range_ipv4:

Static Public Attributes

- datum_type = rpki.ipaddrs.v4addr

  Type of underlying data (min and max).

13.181.1 Detailed Description

```
Range of IPv4 addresses.
```

Definition at line 250 of file resource_set.py.

13.181.2 Member Data Documentation

13.181.2.1 rpki::resource_set.resource_range_ipv4::datum_type = rpki.ipaddrs.v4addr [static]

Type of underlying data (min and max).

Definition at line 258 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.182 rpki.resource_set.resource_range_ipv6 Class Reference

Inheritance diagram for rpki.resource_set.resource_range_ipv6:

Collaboration diagram for rpki.resource_set.resource_range_ipv6:

Static Public Attributes

- datum_type = rpki.ipaddrs.v6addr

  Type of underlying data (min and max).

13.182.1 Detailed Description

```
Range of IPv6 addresses.
```

Definition at line 260 of file resource_set.py.

13.182.2 Member Data Documentation

13.182.2.1 rpki::resource_set.resource_range_ipv6::datum_type = rpki.ipaddrs.v6addr [static]

Type of underlying data (min and max).

Definition at line 268 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.183 rpki.resource_set.resource_set Class Reference

Inheritance diagram for rpki.resource_set.resource_set:

Collaboration diagram for rpki.resource_set.resource_set:

Public Member Functions

- def __init__

- def __str__
- def append
- def canonize
- def contains
- def difference
- def extend
- def from_sql
- def intersection
- def issubset
- def issuperset
- def parse_str
- def symmetric_difference
- def union

Static Public Attributes

- canonical = False

  Whether this resource_set is currently in canonical form.

- inherit = False

  Boolean indicating whether this resource_set uses RFC 3779 inheritance.

Private Member Functions

- def _comm

13.183.1 Detailed Description

```
Generic resource set, a list subclass containing resource ranges.

This is a virtual class.  You probably don't want to use it
directly.
```

Definition at line 286 of file resource_set.py.

13.183.2 Constructor & Destructor Documentation

13.183.2.1 def rpki.resource_set.resource_set.__init__ (*self*, *ini* = `None`)

```
Initialize a resource_set.
```

Definition at line 304 of file resource_set.py.

13.183.3 Member Function Documentation

13.183.3.1 def rpki.resource_set.resource_set.__str__ (*self*)

```
Convert a resource_set to string format.
```

Definition at line 353 of file resource_set.py.

13.183.3.2 def rpki.resource_set.resource_set._comm (*self, other*) [private]

```
Like comm(1), sort of.

Returns a tuple of three resource sets: resources only in self,
resources only in other, and resources in both.  Used (not very
efficiently) as the basis for most set operations on resource
sets.
```

Definition at line 362 of file resource_set.py.

13.183.3.3 def rpki.resource_set.resource_set.append (*self, item*)

```
Wrapper around list.append() (q.v.) to reset canonical flag.
```

Definition at line 339 of file resource_set.py.

13.183.3.4 def rpki.resource_set.resource_set.canonize (*self*)

```
Whack this resource_set into canonical form.
```

Definition at line 323 of file resource_set.py.

13.183.3.5 def rpki.resource_set.resource_set.contains (*self, item*)

```
Set membership test for resource sets.
```

Definition at line 447 of file resource_set.py.

13.183.3.6 def rpki.resource_set.resource_set.difference (*self, other*)

```
Set difference for resource sets.
```

Definition at line 434 of file resource_set.py.

13.183.3.7 def rpki.resource_set.resource_set.extend (*self, item*)

```
Wrapper around list.extend() (q.v.) to reset canonical flag.
```

Definition at line 346 of file resource_set.py.

13.183.3.8 def rpki.resource_set.resource_set.from_sql (*cls, sql, query, args* = ***None***)

```
Create resource set from an SQL query.

sql is an object that supports execute() and fetchall() methods
like a DB API 2.0 cursor object.

query is an SQL query that returns a sequence of (min, max) pairs.
```

Definition at line 487 of file resource_set.py.

13.183.3.9 def rpki.resource_set.resource_set.intersection (*self, other*)

```
Set intersection for resource sets.
```

Definition at line 428 of file resource_set.py.

13.183.3.10 def rpki.resource_set.resource_set.issubset (*self, other*)

```
Test whether self is a subset (possibly improper) of other.
```

Definition at line 471 of file resource_set.py.

13.183.3.11 def rpki.resource_set.resource_set.issuperset (*self, other*)

```
Test whether self is a superset (possibly improper) of other.
```

Definition at line 480 of file resource_set.py.

13.183.3.12 def rpki.resource_set.resource_set.parse_str (*cls, s*)

```
Parse resource set from text string (eg, XML attributes).  This is
a backwards compatability wrapper, real functionality is now part
of the range classes.
```

Definition at line 503 of file resource_set.py.

13.183.3.13 def rpki.resource_set.resource_set.symmetric_difference (*self, other*)

```
Set symmetric difference (XOR) for resource sets.
```

Definition at line 440 of file resource_set.py.

13.183.3.14 def rpki.resource_set.resource_set.union (*self, other*)

```
Set union for resource sets.
```

Definition at line 396 of file resource_set.py.

13.183.4 Member Data Documentation

13.183.4.1 rpki::resource_set.resource_set::canonical = False [static]

Whether this resource_set is currently in canonical form.

Definition at line 302 of file resource_set.py.

13.183.4.2 rpki::resource_set.resource_set::inherit = False [static]

Boolean indicating whether this resource_set uses RFC 3779 inheritance.

Reimplemented in rpki.resource_set.resource_set_as, and rpki.resource_set.resource_-set_ip.

Definition at line 297 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.184 rpki.resource_set.resource_set_as Class Reference

Inheritance diagram for rpki.resource_set.resource_set_as:

Collaboration diagram for rpki.resource_set.resource_set_as:

Public Member Functions

- def parse_rfc3779_tuple
- def to_rfc3779_tuple

Public Attributes

- inherit

  Boolean indicating whether this resource_set uses RFC 3779 inheritance.

Static Public Attributes

- range_type = resource_range_as

  Type of range underlying this type of resource_set.

13.184.1 Detailed Description

```
Autonomous System Number resource set.
```

Definition at line 511 of file resource_set.py.

13.184.2 Member Function Documentation

13.184.2.1 def rpki.resource_set.resource_set_as.parse_rfc3779_tuple (*self, x*)

```
Parse ASN resource from tuple format generated by RFC 3779 ASN.1
decoder.
```

Definition at line 521 of file resource_set.py.

13.184.2.2 def rpki.resource_set.resource_set_as.to_rfc3779_tuple (*self*)

```
Convert ASN resource set into tuple format used for RFC 3779 ASN.1
encoding.
```

Definition at line 539 of file resource_set.py.

13.184.3 Member Data Documentation

13.184.3.1 rpki.resource_set.resource_set_as.inherit

Boolean indicating whether this resource_set uses RFC 3779 inheritance.

Reimplemented from rpki.resource_set.resource_set.

Definition at line 524 of file resource_set.py.

13.184.3.2 rpki::resource_set.resource_set_as::range_type = resource_range_as [static]

Type of range underlying this type of resource_set.

Definition at line 519 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.185 rpki.resource_set.resource_set_ip Class Reference

Inheritance diagram for rpki.resource_set.resource_set_ip:

Collaboration diagram for rpki.resource_set.resource_set_ip:

Public Member Functions

- def parse_rfc3779_tuple
- def to_rfc3779_tuple
- def to_roa_prefix_set

Public Attributes

- inherit

  Boolean indicating whether this resource_set uses RFC 3779 inheritance.

13.185.1 Detailed Description

```
(Generic) IP address resource set.

This is a virtual class.  You probably don't want to use it
directly.
```

Definition at line 552 of file resource_set.py.

13.185.2 Member Function Documentation

13.185.2.1 def rpki.resource_set.resource_set_ip.parse_rfc3779_tuple (*self, x*)

```
Parse IP address resource sets from tuple format generated by RFC
3779 ASN.1 decoder.
```

Definition at line 560 of file resource_set.py.

13.185.2.2 def rpki.resource_set.resource_set_ip.to_rfc3779_tuple (*self*)

```
Convert IP resource set into tuple format used by RFC 3779 ASN.1
encoder.
```

Definition at line 589 of file resource_set.py.

13.185.2.3 def rpki.resource_set.resource_set_ip.to_roa_prefix_set (*self*)

```
Convert from a resource set to a ROA prefix set.
```

Definition at line 578 of file resource_set.py.

13.185.3 Member Data Documentation

13.185.3.1 rpki.resource_set.resource_set_ip.inherit

Boolean indicating whether this resource_set uses RFC 3779 inheritance.

Reimplemented from rpki.resource_set.resource_set.

Definition at line 563 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.186 rpki.resource_set.resource_set_ipv4 Class Reference

Inheritance diagram for rpki.resource_set.resource_set_ipv4:

Collaboration diagram for rpki.resource_set.resource_set_ipv4:

Static Public Attributes

- string afi = "\x00\x01"

  Address Family Identifier value for IPv4.

- range_type = resource_range_ipv4

  Type of range underlying this type of resource_set.

13.186.1 Detailed Description

```
IPv4 address resource set.
```

Definition at line 602 of file resource_set.py.

13.186.2 Member Data Documentation

13.186.2.1 rpki::resource_set.resource_set_ipv4::afi = "\x00\x01" [static]

Address Family Identifier value for IPv4.

Definition at line 615 of file resource_set.py.

13.186.2.2 rpki::resource_set.resource_set_ipv4::range_type = resource_range_ipv4 [static]

Type of range underlying this type of resource_set.

Definition at line 610 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.187 rpki.resource_set.resource_set_ipv6 Class Reference

Inheritance diagram for rpki.resource_set.resource_set_ipv6:

Collaboration diagram for rpki.resource_set.resource_set_ipv6:

Static Public Attributes

- string afi = "\x00\x02"

  Address Family Identifier value for IPv6.

- range_type = resource_range_ipv6

  Type of range underlying this type of resource_set.

13.187.1 Detailed Description

```
IPv6 address resource set.
```

Definition at line 617 of file resource_set.py.

13.187.2 Member Data Documentation

13.187.2.1 rpki::resource_set.resource_set_ipv6::afi = "\x00\x02" [static]

Address Family Identifier value for IPv6.

Definition at line 630 of file resource_set.py.

13.187.2.2 rpki::resource_set.resource_set_ipv6::range_type = resource_range_ipv6 [static]

Type of range underlying this type of resource_set.

Definition at line 625 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.188 rpki.resource_set.roa_prefix Class Reference

Inheritance diagram for rpki.resource_set.roa_prefix:

Collaboration diagram for rpki.resource_set.roa_prefix:

Public Member Functions

- def __cmp__
- def __init__
- def __str__
- def from_roa_tuple
- def max
- def min

- def parse_str
- def to_resource_range
- def to_roa_tuple

Public Attributes

- max_prefixlen

  Maxmimum prefix length.

- prefix

  The prefix itself, an IP address with bits beyond the prefix length zeroed.

- prefixlen

  (Minimum) prefix length.

13.188.1 Detailed Description

```
ROA prefix.  This is similar to the resource_range_ip class, but
differs in that it only represents prefixes, never ranges, and
includes the maximum prefix length as an additional value.

This is a virtual class, you probably don't want to use it directly.
```

Definition at line 801 of file resource_set.py.

13.188.2 Constructor & Destructor Documentation

13.188.2.1 def rpki.resource_set.roa_prefix.__init__ (*self, prefix, prefixlen, max_prefixlen* = `None`)

```
Initialize a ROA prefix.  max_prefixlen is optional and defaults
to prefixlen.  max_prefixlen must not be smaller than prefixlen.
```

Definition at line 820 of file resource_set.py.

13.188.3 Member Function Documentation

13.188.3.1 def rpki.resource_set.roa_prefix.__cmp__ (*self, other*)

```
Compare two ROA prefix objects.  Comparision is based on prefix,
prefixlen, and max_prefixlen, in that order.
```

Definition at line 832 of file resource_set.py.

13.188.3.2 def rpki.resource_set.roa_prefix.__str__ (*self*)

```
Convert a ROA prefix to string format.
```

Definition at line 842 of file resource_set.py.

13.188.3.3 def rpki.resource_set.roa_prefix.from_roa_tuple (*cls, o*)

```
Convert from ROA ASN.1 tuple format.
```

Definition at line 894 of file resource_set.py.

13.188.3.4 def rpki.resource_set.roa_prefix.max (*self*)

```
Return highest address covered by prefix.
```

Definition at line 865 of file resource_set.py.

13.188.3.5 def rpki.resource_set.roa_prefix.min (*self*)

```
Return lowest address covered by prefix.
```

Definition at line 859 of file resource_set.py.

13.188.3.6 def rpki.resource_set.roa_prefix.parse_str (*cls, x*)

```
Parse ROA prefix from text (eg, an XML attribute).
```

Definition at line 881 of file resource_set.py.

13.188.3.7 def rpki.resource_set.roa_prefix.to_resource_range (*self*)

```
Convert this ROA prefix to the equivilent resource_range_ip
object.  This is an irreversable transformation because it loses
the max_prefixlen attribute, nothing we can do about that.
```

Definition at line 851 of file resource_set.py.

13.188.3.8 def rpki.resource_set.roa_prefix.to_roa_tuple (*self*)

```
Convert a resource_range_ip to tuple format for ROA ASN.1
encoding.
```

Definition at line 872 of file resource_set.py.

13.188.4 Member Data Documentation

13.188.4.1 rpki::resource_set.roa_prefix::max_prefixlen

Maxmimum prefix length.

Definition at line 823 of file resource_set.py.

13.188.4.2 rpki::resource_set.roa_prefix::prefix

The prefix itself, an IP address with bits beyond the prefix length zeroed.

Definition at line 823 of file resource_set.py.

13.188.4.3 rpki::resource_set.roa_prefix::prefixlen

(Minimum) prefix length.

Definition at line 823 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.189 rpki.resource_set.roa_prefix_ipv4 Class Reference

Inheritance diagram for rpki.resource_set.roa_prefix_ipv4:

Collaboration diagram for rpki.resource_set.roa_prefix_ipv4:

Static Public Attributes

- range_type = resource_range_ipv4

  Type of corresponding resource_range_ip.

13.189.1 Detailed Description

```
IPv4 ROA prefix.
```

Definition at line 901 of file resource_set.py.

13.189.2 Member Data Documentation

13.189.2.1 rpki::resource_set.roa_prefix_ipv4::range_type = resource_range_ipv4 [static]

Type of corresponding resource_range_ip.

Definition at line 909 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.190 rpki.resource_set.roa_prefix_ipv6 Class Reference

Inheritance diagram for rpki.resource_set.roa_prefix_ipv6:

Collaboration diagram for rpki.resource_set.roa_prefix_ipv6:

Static Public Attributes

- range_type = resource_range_ipv6

  Type of corresponding resource_range_ip.

13.190.1 Detailed Description

```
IPv6 ROA prefix.
```

Definition at line 911 of file resource_set.py.

13.190.2 Member Data Documentation

13.190.2.1 rpki::resource_set.roa_prefix_ipv6::range_type = resource_range_ipv6 [static]

Type of corresponding resource_range_ip.

Definition at line 919 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.191 rpki.resource_set.roa_prefix_set Class Reference

Inheritance diagram for rpki.resource_set.roa_prefix_set:

Collaboration diagram for rpki.resource_set.roa_prefix_set:

Public Member Functions

- def __init__
- def __str__
- def from_sql
- def parse_str
- def to_resource_set
- def to_roa_tuple

13.191.1 Detailed Description

```
Set of ROA prefixes, analogous to the resource_set_ip class.
```

Definition at line 921 of file resource_set.py.

13.191.2 Constructor & Destructor Documentation

13.191.2.1 def rpki.resource_set.roa_prefix_set.__init__ (*self, ini = None*)

```
Initialize a ROA prefix set.
```

Definition at line 926 of file resource_set.py.

13.191.3 Member Function Documentation

13.191.3.1 def rpki.resource_set.roa_prefix_set.__str__ (*self*)

```
Convert a ROA prefix set to string format.
```

Definition at line 939 of file resource_set.py.

13.191.3.2 def rpki.resource_set.roa_prefix_set.from_sql (*cls, sql, query, args = None*)

```
Create ROA prefix set from an SQL query.

sql is an object that supports execute() and fetchall() methods
like a DB API 2.0 cursor object.

query is an SQL query that returns a sequence of (prefix,
prefixlen, max_prefixlen) triples.
```

Definition at line 971 of file resource_set.py.

13.191.3.3 def rpki.resource_set.roa_prefix_set.parse_str (*cls, s*)

```
Parse ROA prefix from text (eg, an XML attribute).
This method is a backwards compatability shim.
```

Definition at line 946 of file resource_set.py.

13.191.3.4 def rpki.resource_set.roa_prefix_set.to_resource_set (*self*)

```
Convert a ROA prefix set to a resource set.  This is an
irreversable transformation.  We have to compute a union here
because ROA prefix sets can include overlaps, while RFC 3779
resource sets cannot.  This is ugly, and there is almost certainly
a more efficient way to do this, but start by getting the output
right before worrying about making it fast or pretty.
```

Definition at line 953 of file resource_set.py.

13.191.3.5 def rpki.resource_set.roa_prefix_set.to_roa_tuple (*self*)

```
Convert ROA prefix set into tuple format used by ROA ASN.1
encoder.  This is a variation on the format used in RFC 3779.
```

Definition at line 986 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.192 rpki.resource_set.roa_prefix_set_ipv4 Class Reference

Inheritance diagram for rpki.resource_set.roa_prefix_set_ipv4:

Collaboration diagram for rpki.resource_set.roa_prefix_set_ipv4:

Static Public Attributes

- prefix_type = roa_prefix_ipv4

  Type of underlying roa_prefix.

- resource_set_type = resource_set_ipv4

  Type of corresponding resource_set_ip class.

13.192.1 Detailed Description

```
Set of IPv4 ROA prefixes.
```

Definition at line 996 of file resource_set.py.

13.192.2 Member Data Documentation

13.192.2.1 rpki::resource_set.roa_prefix_set_ipv4::prefix_type = roa_prefix_ipv4 [static]

Type of underlying roa_prefix.

Definition at line 1004 of file resource_set.py.

13.192.2.2 rpki::resource_set.roa_prefix_set_ipv4::resource_set_type = resource_set_ipv4 [static]

Type of corresponding resource_set_ip class.

Definition at line 1009 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.193 rpki.resource_set.roa_prefix_set_ipv6 Class Reference

Inheritance diagram for rpki.resource_set.roa_prefix_set_ipv6:

Collaboration diagram for rpki.resource_set.roa_prefix_set_ipv6:

Static Public Attributes

- prefix_type = roa_prefix_ipv6

  Type of underlying roa_prefix.

- resource_set_type = resource_set_ipv6

  Type of corresponding resource_set_ip class.

13.193.1 Detailed Description

```
Set of IPv6 ROA prefixes.
```

Definition at line 1014 of file resource_set.py.

13.193.2 Member Data Documentation

13.193.2.1 rpki::resource_set.roa_prefix_set_ipv6::prefix_type = roa_prefix_ipv6 [static]

Type of underlying roa_prefix.

Definition at line 1022 of file resource_set.py.

13.193.2.2 rpki::resource_set.roa_prefix_set_ipv6::resource_set_type = resource_set_ipv6 [static]

Type of corresponding resource_set_ip class.

Definition at line 1027 of file resource_set.py.

The documentation for this class was generated from the following file:

- resource_set.py (3688)

13.194 rpki.roa.ROAIPAddress Class Reference

Inheritance diagram for rpki.roa.ROAIPAddress:

Collaboration diagram for rpki.roa.ROAIPAddress:

Public Member Functions

- def __init__

Public Attributes

- address
- maxLength

13.194.1 Detailed Description

Definition at line 47 of file roa.py.

13.194.2 Constructor & Destructor Documentation

13.194.2.1 def rpki.roa.ROAIPAddress.__init__ (*self, optional = 0, default = ″*)

Definition at line 48 of file roa.py.

13.194.3 Member Data Documentation

13.194.3.1 rpki.roa.ROAIPAddress.address

Definition at line 48 of file roa.py.

13.194.3.2 rpki.roa.ROAIPAddress.maxLength

Definition at line 48 of file roa.py.

The documentation for this class was generated from the following file:

- roa.py (3598)

13.195 rpki.roa.ROAIPAddresses Class Reference

Inheritance diagram for rpki.roa.ROAIPAddresses:

Collaboration diagram for rpki.roa.ROAIPAddresses:

Public Member Functions

- def __init__

13.195.1 Detailed Description

Definition at line 54 of file roa.py.

13.195.2 Constructor & Destructor Documentation

13.195.2.1 def rpki.roa.ROAIPAddresses.__init__ (*self, optional = 0, default = ″*)

Definition at line 55 of file roa.py.

The documentation for this class was generated from the following file:

- roa.py (3598)

13.196 rpki.roa.ROAIPAddressFamilies Class Reference

Inheritance diagram for rpki.roa.ROAIPAddressFamilies:

Collaboration diagram for rpki.roa.ROAIPAddressFamilies:

Public Member Functions

- def __init__

13.196.1 Detailed Description

Definition at line 65 of file roa.py.

13.196.2 Constructor & Destructor Documentation

13.196.2.1 def rpki.roa.ROAIPAddressFamilies.__init__ (*self, optional = 0, default = ″*)

Definition at line 66 of file roa.py.

The documentation for this class was generated from the following file:

- roa.py (3598)

13.197 rpki.roa.ROAIPAddressFamily Class Reference

Inheritance diagram for rpki.roa.ROAIPAddressFamily:

Collaboration diagram for rpki.roa.ROAIPAddressFamily:

Public Member Functions

- def __init__

Public Attributes

- addresses
- addressFamily

13.197.1 Detailed Description

Definition at line 58 of file roa.py.

13.197.2 Constructor & Destructor Documentation

13.197.2.1 def rpki.roa.ROAIPAddressFamily.__init__ (*self, optional = 0, default = ″*)

Definition at line 59 of file roa.py.

13.197.3 Member Data Documentation

13.197.3.1 rpki.roa.ROAIPAddressFamily.addresses

Definition at line 59 of file roa.py.

13.197.3.2 rpki.roa.ROAIPAddressFamily.addressFamily

Definition at line 59 of file roa.py.

The documentation for this class was generated from the following file:

- roa.py (3598)

13.198 rpki.roa.RouteOriginAttestation Class Reference

Inheritance diagram for rpki.roa.RouteOriginAttestation:

Collaboration diagram for rpki.roa.RouteOriginAttestation:

Public Member Functions

- def __init__

Public Attributes

- asID
- explicitVersion
- ipAddrBlocks
- version

13.198.1 Detailed Description

Definition at line 69 of file roa.py.

13.198.2 Constructor & Destructor Documentation

13.198.2.1 def rpki.roa.RouteOriginAttestation.__init__ (*self, optional = 0, default = ″*)

Definition at line 70 of file roa.py.

13.198.3 Member Data Documentation

13.198.3.1 rpki.roa.RouteOriginAttestation.asID

Definition at line 70 of file roa.py.

13.198.3.2 rpki.roa.RouteOriginAttestation.explicitVersion

Definition at line 70 of file roa.py.

13.198.3.3 rpki.roa.RouteOriginAttestation.ipAddrBlocks

Definition at line 70 of file roa.py.

13.198.3.4 rpki.roa.RouteOriginAttestation.version

Definition at line 70 of file roa.py.

The documentation for this class was generated from the following file:

- roa.py (3598)

13.199 rpki.rootd.cms_msg Class Reference

Inheritance diagram for rpki.rootd.cms_msg:

Collaboration diagram for rpki.rootd.cms_msg:

Static Public Attributes

- saxify = sax_handler.saxify

13.199.1 Detailed Description

Definition at line 93 of file rpki/rootd.py.

13.199.2 Member Data Documentation

13.199.2.1 rpki.rootd.cms_msg.saxify = sax_handler.saxify [static]

Reimplemented from rpki.up_down.cms_msg.

Definition at line 94 of file rpki/rootd.py.

The documentation for this class was generated from the following file:

- rpki/rootd.py (3793)

13.200 rpki.rootd.issue_pdu Class Reference

Inheritance diagram for rpki.rootd.issue_pdu:

Collaboration diagram for rpki.rootd.issue_pdu:

Public Member Functions

- def serve_pdu

13.200.1 Detailed Description

Definition at line 52 of file rpki/rootd.py.

13.200.2 Member Function Documentation

13.200.2.1 def rpki.rootd.issue_pdu.serve_pdu (*self, q_msg, r_msg, child, callback, errback*)

```
Serve one issue request PDU.
```

Reimplemented from rpki.up_down.issue_pdu.

Definition at line 53 of file rpki/rootd.py.

The documentation for this class was generated from the following file:

- rpki/rootd.py (3793)

13.201 rpki.rootd.list_pdu Class Reference

Inheritance diagram for rpki.rootd.list_pdu:

Collaboration diagram for rpki.rootd.list_pdu:

Public Member Functions

- def serve_pdu

13.201.1 Detailed Description

Definition at line 46 of file rpki/rootd.py.

13.201.2 Member Function Documentation

13.201.2.1 def rpki.rootd.list_pdu.serve_pdu (*self, q_msg, r_msg, child, callback, errback*)

```
Serve one "list" PDU.
```

Reimplemented from rpki.up_down.list_pdu.

Definition at line 47 of file rpki/rootd.py.

The documentation for this class was generated from the following file:

- rpki/rootd.py (3793)

13.202 rpki.rootd.main Class Reference

Inheritance diagram for rpki.rootd.main:

Collaboration diagram for rpki.rootd.main:

Public Member Functions

- def __init__
- def compose_response
- def del_subject_cert
- def del_subject_pkcs10
- def get_root_cert
- def get_subject_cert
- def get_subject_pkcs10
- def issue_subject_cert_maybe
- def root_newer_than_subject
- def set_subject_cert
- def set_subject_pkcs10
- def up_down_handler

Public Attributes

- bpki_ta
- cfg
- cfg_file
- child_bpki_cert
- http_server_host
- http_server_port
- rootd_bpki_cert
- rootd_bpki_crl
- rootd_bpki_key
- rpki_base_uri
- rpki_class_name
- rpki_root_cert_file
- rpki_root_cert_uri
- rpki_root_crl
- rpki_root_dir
- rpki_root_key
- rpki_root_manifest
- rpki_subject_cert
- rpki_subject_lifetime
- rpki_subject_pkcs10
- rpki_subject_regen

Static Public Attributes

- rpki_root_cert = None

13.202.1 Detailed Description

Definition at line 96 of file rpki/rootd.py.

13.202.2 Constructor & Destructor Documentation

13.202.2.1 def rpki.rootd.main.__init__ (*self*)

Definition at line 262 of file rpki/rootd.py.

13.202.3 Member Function Documentation

13.202.3.1 def rpki.rootd.main.compose_response (*self, r_msg, pkcs10 = None*)

Definition at line 223 of file rpki/rootd.py.

13.202.3.2 def rpki.rootd.main.del_subject_cert (*self*)

Definition at line 123 of file rpki/rootd.py.

13.202.3.3 def rpki.rootd.main.del_subject_pkcs10 (*self*)

Definition at line 142 of file rpki/rootd.py.

13.202.3.4 def rpki.rootd.main.get_root_cert (*self*)

Definition at line 100 of file rpki/rootd.py.

13.202.3.5 def rpki.rootd.main.get_subject_cert (*self*)

Definition at line 107 of file rpki/rootd.py.

13.202.3.6 def rpki.rootd.main.get_subject_pkcs10 (*self*)

Definition at line 128 of file rpki/rootd.py.

13.202.3.7 def rpki.rootd.main.issue_subject_cert_maybe (*self, new_pkcs10*)

Definition at line 149 of file rpki/rootd.py.

13.202.3.8 def rpki.rootd.main.root_newer_than_subject (*self*)

Definition at line 104 of file rpki/rootd.py.

13.202.3.9 def rpki.rootd.main.set_subject_cert (*self, cert*)

Definition at line 116 of file rpki/rootd.py.

13.202.3.10 def rpki.rootd.main.set_subject_pkcs10 (*self, pkcs10*)

Definition at line 136 of file rpki/rootd.py.

13.202.3.11 def rpki.rootd.main.up_down_handler (*self, query, path, cb*)

Definition at line 236 of file rpki/rootd.py.

13.202.4 Member Data Documentation

13.202.4.1 rpki.rootd.main.bpki_ta

Definition at line 262 of file rpki/rootd.py.

13.202.4.2 rpki.rootd.main.cfg

Definition at line 262 of file rpki/rootd.py.

13.202.4.3 rpki.rootd.main.cfg_file

Definition at line 262 of file rpki/rootd.py.

13.202.4.4 rpki.rootd.main.child_bpki_cert

Definition at line 262 of file rpki/rootd.py.

13.202.4.5 rpki.rootd.main.http_server_host

Definition at line 262 of file rpki/rootd.py.

13.202.4.6 rpki.rootd.main.http_server_port

Definition at line 262 of file rpki/rootd.py.

13.202.4.7 rpki.rootd.main.rootd_bpki_cert

Definition at line 262 of file rpki/rootd.py.

13.202.4.8 rpki.rootd.main.rootd_bpki_crl

Definition at line 262 of file rpki/rootd.py.

13.202.4.9 rpki.rootd.main.rootd_bpki_key

Definition at line 262 of file rpki/rootd.py.

13.202.4.10 rpki.rootd.main.rpki_base_uri

Definition at line 262 of file rpki/rootd.py.

13.202.4.11 rpki.rootd.main.rpki_class_name

Definition at line 262 of file rpki/rootd.py.

13.202.4.12 rpki.rootd.main.rpki_root_cert = None [static]

Definition at line 98 of file rpki/rootd.py.

13.202.4.13 rpki.rootd.main.rpki_root_cert_file

Definition at line 262 of file rpki/rootd.py.

13.202.4.14 rpki.rootd.main.rpki_root_cert_uri

Definition at line 262 of file rpki/rootd.py.

13.202.4.15 rpki.rootd.main.rpki_root_crl

Definition at line 262 of file rpki/rootd.py.

13.202.4.16 rpki.rootd.main.rpki_root_dir

Definition at line 262 of file rpki/rootd.py.

13.202.4.17 rpki.rootd.main.rpki_root_key

Definition at line 262 of file rpki/rootd.py.

13.202.4.18 rpki.rootd.main.rpki_root_manifest

Definition at line 262 of file rpki/rootd.py.

13.202.4.19 rpki.rootd.main.rpki_subject_cert

Definition at line 262 of file rpki/rootd.py.

13.202.4.20 rpki.rootd.main.rpki_subject_lifetime

Definition at line 262 of file rpki/rootd.py.

13.202.4.21 rpki.rootd.main.rpki_subject_pkcs10

Definition at line 262 of file rpki/rootd.py.

13.202.4.22 rpki.rootd.main.rpki_subject_regen

Definition at line 262 of file rpki/rootd.py.

The documentation for this class was generated from the following file:

- rpki/rootd.py (3793)

13.203 rpki.rootd.message_pdu Class Reference

Inheritance diagram for rpki.rootd.message_pdu:

Collaboration diagram for rpki.rootd.message_pdu:

Public Member Functions

- def log_query

Static Public Attributes

- dictionary name2type
- tuple type2name = dict((v, k) for k, v in name2type.items())

13.203.1 Detailed Description

Definition at line 71 of file rpki/rootd.py.

13.203.2 Member Function Documentation

13.203.2.1 def rpki.rootd.message_pdu.log_query (*self, child*)

```
Log query we're handling.
```

Reimplemented from rpki.up_down.message_pdu.

Definition at line 84 of file rpki/rootd.py.

13.203.3 Member Data Documentation

13.203.3.1 dictionary rpki.rootd.message_pdu.name2type [static]

Initial value:

```
{
    "list"            : list_pdu,
    "list_response"   : rpki.up_down.list_response_pdu,
    "issue"           : issue_pdu,
    "issue_response"  : rpki.up_down.issue_response_pdu,
    "revoke"          : revoke_pdu,
    "revoke_response" : rpki.up_down.revoke_response_pdu,
    "error_response"  : rpki.up_down.error_response_pdu }
```

Reimplemented from rpki.up_down.message_pdu.

Definition at line 73 of file rpki/rootd.py.

13.203.3.2 tuple rpki.rootd.message_pdu.type2name = dict((v, k) for k, v in name2type.items()) [static]

Reimplemented from rpki.up_down.message_pdu.

Definition at line 82 of file rpki/rootd.py.

The documentation for this class was generated from the following file:

- rpki/rootd.py (3793)

13.204 rpki.rootd.revoke_pdu Class Reference

Inheritance diagram for rpki.rootd.revoke_pdu:

Collaboration diagram for rpki.rootd.revoke_pdu:

Public Member Functions

- def serve_pdu

13.204.1 Detailed Description

Definition at line 59 of file rpki/rootd.py.

13.204.2 Member Function Documentation

13.204.2.1 def rpki.rootd.revoke_pdu.serve_pdu (*self, q_msg, r_msg, child, cb, eb*)

```
Serve one revoke request PDU.
```

Reimplemented from rpki.up_down.revoke_pdu.

Definition at line 60 of file rpki/rootd.py.

The documentation for this class was generated from the following file:

- rpki/rootd.py (3793)

13.205 rpki.rootd.sax_handler Class Reference

Inheritance diagram for rpki.rootd.sax_handler:

Collaboration diagram for rpki.rootd.sax_handler:

Static Public Attributes

- pdu = message_pdu

13.205.1 Detailed Description

Definition at line 90 of file rpki/rootd.py.

13.205.2 Member Data Documentation

13.205.2.1 rpki.rootd.sax_handler.pdu = message_pdu [static]

Reimplemented from rpki.up_down.sax_handler.

Definition at line 91 of file rpki/rootd.py.

The documentation for this class was generated from the following file:

- rpki/rootd.py (3793)

13.206 rpki.rpkid.ca_detail_obj Class Reference

Inheritance diagram for rpki.rpkid.ca_detail_obj:

Collaboration diagram for rpki.rpkid.ca_detail_obj:

Public Member Functions

- def activate
- def ca
- def child_certs
- def create
- def crl_published_callback
- def crl_uri
- def crl_uri_tail
- def delete
- def fetch_child_certs
- def generate_crl
- def generate_manifest
- def generate_manifest_cert
- def ghostbusters
- def has_expired
- def issue
- def issue_ee
- def manifest_published_callback
- def manifest_uri
- def reissue
- def revoke
- def revoked_certs
- def roas
- def sql_decode
- def update

Public Attributes

- ca_cert_uri
- ca_id
- gctx
- latest_crl
- latest_manifest
- latest_manifest_cert
- manifest_private_key_id
- manifest_public_key
- private_key_id
- public_key
- state

Static Public Attributes

- crl_published = None
- latest_ca_cert = None
- manifest_published = None
- tuple sql_template

13.206.1 Detailed Description

```
Internal CA detail object.
```

Definition at line 653 of file rpki/rpkid.py.

13.206.2 Member Function Documentation

13.206.2.1 def rpki.rpkid.ca_detail_obj.activate (*self, ca, cert, uri, callback, errback, predecessor* = `None`)

```
Activate this ca_detail.
```

Definition at line 755 of file rpki/rpkid.py.

13.206.2.2 def rpki.rpkid.ca_detail_obj.ca (*self*)

```
Fetch CA object to which this ca_detail links.
```

Definition at line 688 of file rpki/rpkid.py.

13.206.2.3 def rpki.rpkid.ca_detail_obj.child_certs (*self*)

```
Fetch all child_cert objects that link to this ca_detail.
```

Definition at line 701 of file rpki/rpkid.py.

13.206.2.4 def rpki.rpkid.ca_detail_obj.create (*cls, ca*)

```
Create a new ca_detail object for a specified CA.
```

Definition at line 913 of file rpki/rpkid.py.

13.206.2.5 def rpki.rpkid.ca_detail_obj.crl_published_callback (*self, pdu*)

```
Check result of CRL publication.
```

Definition at line 1036 of file rpki/rpkid.py.

13.206.2.6 def rpki.rpkid.ca_detail_obj.crl_uri (*self*)

```
Return publication URI for this ca_detail's CRL.
```

Definition at line 729 of file rpki/rpkid.py.

13.206.2.7 def rpki.rpkid.ca_detail_obj.crl_uri_tail (*self*)

```
Return tail (filename portion) of publication URI for this ca_detail's CRL.
```

Definition at line 736 of file rpki/rpkid.py.

13.206.2.8 def rpki.rpkid.ca_detail_obj.delete (*self, ca, publisher, allow_failure* = **`False`**)

```
Delete this ca_detail and all of the certs it issued.

If allow_failure is true, we clean up as much as we can but don't
raise an exception.
```

Definition at line 782 of file rpki/rpkid.py.

13.206.2.9 def rpki.rpkid.ca_detail_obj.fetch_child_certs (*self*, *child* = `None`, *ski* = `None`, *unique* = `False`)

```
Fetch all child_cert objects that link to this ca_detail.
```

Definition at line 694 of file rpki/rpkid.py.

13.206.2.10 def rpki.rpkid.ca_detail_obj.generate_crl (*self*, *publisher*, *nextUpdate* = `None`)

```
Generate a new CRL for this ca_detail.  At the moment this is
unconditional, that is, it is up to the caller to decide whether a
new CRL is needed.
```

Definition at line 1000 of file rpki/rpkid.py.

13.206.2.11 def rpki.rpkid.ca_detail_obj.generate_manifest (*self*, *publisher*, *nextUpdate* = `None`)

```
Generate a new manifest for this ca_detail.
```

Definition at line 1044 of file rpki/rpkid.py.

13.206.2.12 def rpki.rpkid.ca_detail_obj.generate_manifest_cert (*self*)

```
Generate a new manifest certificate for this ca_detail.
```

Definition at line 948 of file rpki/rpkid.py.

13.206.2.13 def rpki.rpkid.ca_detail_obj.ghostbusters (*self*)

```
Fetch all Ghostbuster objects that link to this ca_detail.
```

Definition at line 722 of file rpki/rpkid.py.

13.206.2.14 def rpki.rpkid.ca_detail_obj.has_expired (*self*)

```
Return whether this ca_detail's certificate has expired.
```

Definition at line 749 of file rpki/rpkid.py.

13.206.2.15 def rpki.rpkid.ca_detail_obj.issue (*self, ca, child, subject_key, sia, resources, publisher, child_cert* = `None`)

```
Issue a new certificate to a child.  Optional child_cert argument
specifies an existing child_cert object to update in place; if not
specified, we create a new one.  Returns the child_cert object
containing the newly issued cert.
```

Definition at line 956 of file rpki/rpkid.py.

13.206.2.16 def rpki.rpkid.ca_detail_obj.issue_ee (*self, ca, resources, subject_key, sia* = `None`)

```
Issue a new EE certificate.
```

Definition at line 931 of file rpki/rpkid.py.

13.206.2.17 def rpki.rpkid.ca_detail_obj.manifest_published_callback (*self, pdu*)

```
Check result of manifest publication.
```

Definition at line 1079 of file rpki/rpkid.py.

13.206.2.18 def rpki.rpkid.ca_detail_obj.manifest_uri (*self*)

```
Return publication URI for this ca_detail's manifest.
```

Definition at line 743 of file rpki/rpkid.py.

13.206.2.19 def rpki.rpkid.ca_detail_obj.reissue (*self, cb, eb*)

```
Reissue all current certificates issued by this ca_detail.
```

Definition at line 1087 of file rpki/rpkid.py.

13.206.2.20 def rpki.rpkid.ca_detail_obj.revoke (*self, cb, eb*)

```
Request revocation of all certificates whose SKI matches the key
for this ca_detail.

Tasks:

- Request revocation of old keypair by parent.

- Revoke all child certs issued by the old keypair.

- Generate a final CRL, signed with the old keypair, listing all
  the revoked certs, with a next CRL time after the last cert or
  CRL signed by the old keypair will have expired.

- Generate a corresponding final manifest.

- Destroy old keypairs.

- Leave final CRL and manifest in place until their nextupdate
  time has passed.
```

Definition at line 816 of file rpki/rpkid.py.

13.206.2.21 def rpki.rpkid.ca_detail_obj.revoked_certs (*self*)

```
Fetch all revoked_cert objects that link to this ca_detail.
```

Definition at line 708 of file rpki/rpkid.py.

13.206.2.22 def rpki.rpkid.ca_detail_obj.roas (*self*)

```
Fetch all ROA objects that link to this ca_detail.
```

Definition at line 715 of file rpki/rpkid.py.

13.206.2.23 def rpki.rpkid.ca_detail_obj.sql_decode (*self, vals*)

```
Extra assertions for SQL decode of a ca_detail_obj.
```

Reimplemented from rpki.sql.sql_persistent.

Definition at line 679 of file rpki/rpkid.py.

13.206.2.24 def rpki.rpkid.ca_detail_obj.update (*self, parent, ca, rc, sia_uri_changed, old_resources, callback, errback*)

```
Need to get a new certificate for this ca_detail and perhaps frob
children of this ca_detail.
```

Definition at line 888 of file rpki/rpkid.py.

13.206.3 Member Data Documentation

13.206.3.1 rpki.rpkid.ca_detail_obj.ca_cert_uri

Definition at line 757 of file rpki/rpkid.py.

13.206.3.2 rpki.rpkid.ca_detail_obj.ca_id

Definition at line 915 of file rpki/rpkid.py.

13.206.3.3 rpki.rpkid.ca_detail_obj.crl_published = None [static]

Definition at line 675 of file rpki/rpkid.py.

13.206.3.4 rpki.rpkid.ca_detail_obj.gctx

Reimplemented from rpki.sql.sql_persistent.

Definition at line 915 of file rpki/rpkid.py.

13.206.3.5 rpki.rpkid.ca_detail_obj.latest_ca_cert = None [static]

Definition at line 677 of file rpki/rpkid.py.

13.206.3.6 rpki.rpkid.ca_detail_obj.latest_crl

Definition at line 1004 of file rpki/rpkid.py.

13.206.3.7 rpki.rpkid.ca_detail_obj.latest_manifest

Definition at line 1046 of file rpki/rpkid.py.

13.206.3.8 rpki.rpkid.ca_detail_obj.latest_manifest_cert

Definition at line 836 of file rpki/rpkid.py.

13.206.3.9 rpki.rpkid.ca_detail_obj.manifest_private_key_id

Definition at line 836 of file rpki/rpkid.py.

13.206.3.10 rpki.rpkid.ca_detail_obj.manifest_public_key

Definition at line 836 of file rpki/rpkid.py.

13.206.3.11 rpki.rpkid.ca_detail_obj.manifest_published = None [static]

Definition at line 676 of file rpki/rpkid.py.

13.206.3.12 rpki.rpkid.ca_detail_obj.private_key_id

Definition at line 836 of file rpki/rpkid.py.

13.206.3.13 rpki.rpkid.ca_detail_obj.public_key

Definition at line 915 of file rpki/rpkid.py.

13.206.3.14 tuple rpki.rpkid.ca_detail_obj.sql_template [static]

Initial value:

```
rpki.sql.template(
    "ca_detail",
    "ca_detail_id",
    ("private_key_id",          rpki.x509.RSA),
    ("public_key",              rpki.x509.RSApublic),
    ("latest_ca_cert",          rpki.x509.X509),
    ("manifest_private_key_id", rpki.x509.RSA),
    ("manifest_public_key",     rpki.x509.RSApublic),
    ("latest_manifest_cert",    rpki.x509.X509),
    ("latest_manifest",         rpki.x509.SignedManifest),
    ("latest_crl",              rpki.x509.CRL),
    ("crl_published",           rpki.sundial.datetime),
    ("manifest_published",      rpki.sundial.datetime),
    "state",
    "ca_cert_uri",
    "ca_id")
```

Definition at line 658 of file rpki/rpkid.py.

13.206.3.15 rpki.rpkid.ca_detail_obj.state

Definition at line 757 of file rpki/rpkid.py.

The documentation for this class was generated from the following file:

- rpki/rpkid.py (3793)

13.207 rpki.rpkid.ca_obj Class Reference

Inheritance diagram for rpki.rpkid.ca_obj:

Collaboration diagram for rpki.rpkid.ca_obj:

Public Member Functions

- def active_ca_detail
- def ca_details
- def check_for_updates
- def construct_sia_uri
- def create
- def delete
- def deprecated_ca_details
- def issue_response_candidate_ca_details
- def next_crl_number
- def next_manifest_number
- def next_serial_number
- def parent
- def pending_ca_details
- def reissue
- def rekey
- def revoke
- def revoked_ca_details

Public Attributes

- gctx
- parent_id
- parent_resource_class
- sia_uri

Static Public Attributes

- int last_crl_sn = 0
- int last_issued_sn = 0
- int last_manifest_sn = 0
- tuple sql_template

13.207.1 Detailed Description

```
Internal CA object.
```

Definition at line 360 of file rpki/rpkid.py.

13.207.2 Member Function Documentation

13.207.2.1 def rpki.rpkid.ca_obj.active_ca_detail (*self*)

```
Fetch the active ca_detail for this CA, if any.
```

Definition at line 400 of file rpki/rpkid.py.

13.207.2.2 def rpki.rpkid.ca_obj.ca_details (*self*)

```
Fetch all ca_detail objects that link to this CA object.
```

Definition at line 386 of file rpki/rpkid.py.

13.207.2.3 def rpki.rpkid.ca_obj.check_for_updates (*self, parent, rc, cb, eb*)

```
Parent has signaled continued existance of a resource class we
already knew about, so we need to check for an updated
certificate, changes in resource coverage, revocation and reissue
with the same key, etc.
```

Definition at line 442 of file rpki/rpkid.py.

13.207.2.4 def rpki.rpkid.ca_obj.construct_sia_uri (*self, parent, rc*)

```
Construct the sia_uri value for this CA given configured
information and the parent's up-down protocol list_response PDU.
```

Definition at line 429 of file rpki/rpkid.py.

13.207.2.5 def rpki.rpkid.ca_obj.create (*cls, parent, rc, cb, eb*)

```
Parent has signaled existance of a new resource class, so we need
to create and set up a corresponding CA object.
```

Definition at line 531 of file rpki/rpkid.py.

13.207.2.6 def rpki.rpkid.ca_obj.delete (*self, parent, callback*)

```
The list of current resource classes received from parent does not
include the class corresponding to this CA, so we need to delete
it (and its little dog too...).

All certs published by this CA are now invalid, so need to
withdraw them, the CRL, and the manifest from the repository,
delete all child_cert and ca_detail records associated with this
CA, then finally delete this CA itself.
```

Definition at line 555 of file rpki/rpkid.py.

13.207.2.7 def rpki.rpkid.ca_obj.deprecated_ca_details (*self*)

```
Fetch deprecated ca_details for this CA, if any.
```

Definition at line 407 of file rpki/rpkid.py.

13.207.2.8 def rpki.rpkid.ca_obj.issue_response_candidate_ca_details (*self*)

```
Fetch ca_details which are candidates for consideration when
processing an up-down issue_response PDU.
```

Definition at line 421 of file rpki/rpkid.py.

13.207.2.9 def rpki.rpkid.ca_obj.next_crl_number (*self*)

```
Allocate a CRL serial number.
```

Definition at line 597 of file rpki/rpkid.py.

13.207.2.10 def rpki.rpkid.ca_obj.next_manifest_number (*self*)

```
Allocate a manifest serial number.
```

Definition at line 589 of file rpki/rpkid.py.

13.207.2.11 def rpki.rpkid.ca_obj.next_serial_number (*self*)

```
Allocate a certificate serial number.
```

Definition at line 581 of file rpki/rpkid.py.

13.207.2.12 def rpki.rpkid.ca_obj.parent (*self*)

```
Fetch parent object to which this CA object links.
```

Definition at line 379 of file rpki/rpkid.py.

13.207.2.13 def rpki.rpkid.ca_obj.pending_ca_details (*self*)

```
Fetch the pending ca_details for this CA, if any.
```

Definition at line 393 of file rpki/rpkid.py.

13.207.2.14 def rpki.rpkid.ca_obj.reissue (*self, cb, eb*)

```
Reissue all current certificates issued by this CA.
```

Definition at line 642 of file rpki/rpkid.py.

13.207.2.15 def rpki.rpkid.ca_obj.rekey (*self, cb, eb*)

```
Initiate a rekey operation for this ca.  Generate a new keypair.
Request cert from parent using new keypair.  Mark result as our
active ca_detail.  Reissue all child certs issued by this ca using
the new ca_detail.
```

Definition at line 605 of file rpki/rpkid.py.

13.207.2.16 def rpki.rpkid.ca_obj.revoke (*self, cb, eb*)

```
Revoke deprecated ca_detail objects associated with this ca.
```

Definition at line 630 of file rpki/rpkid.py.

13.207.2.17 def rpki.rpkid.ca_obj.revoked_ca_details (*self*)

```
Fetch revoked ca_details for this CA, if any.
```

Definition at line 414 of file rpki/rpkid.py.

13.207.3 Member Data Documentation

13.207.3.1 rpki.rpkid.ca_obj.gctx

Reimplemented from rpki.sql.sql_persistent.

Definition at line 534 of file rpki/rpkid.py.

13.207.3.2 int rpki.rpkid.ca_obj.last_crl_sn = 0 [static]

Definition at line 374 of file rpki/rpkid.py.

13.207.3.3 int rpki.rpkid.ca_obj.last_issued_sn = 0 [static]

Definition at line 375 of file rpki/rpkid.py.

13.207.3.4 int rpki.rpkid.ca_obj.last_manifest_sn = 0 [static]

Definition at line 376 of file rpki/rpkid.py.

13.207.3.5 rpki.rpkid.ca_obj.parent_id

Definition at line 534 of file rpki/rpkid.py.

13.207.3.6 rpki.rpkid.ca_obj.parent_resource_class

Definition at line 534 of file rpki/rpkid.py.

13.207.3.7 rpki.rpkid.ca_obj.sia_uri

Definition at line 447 of file rpki/rpkid.py.

13.207.3.8 tuple rpki.rpkid.ca_obj.sql_template [static]

Initial value:

```
rpki.sql.template(
    "ca",
    "ca_id",
    "last_crl_sn",
    ("next_crl_update", rpki.sundial.datetime),
    "last_issued_sn", "last_manifest_sn",
    ("next_manifest_update", rpki.sundial.datetime),
    "sia_uri", "parent_id", "parent_resource_class")
```

Definition at line 365 of file rpki/rpkid.py.

The documentation for this class was generated from the following file:

- rpki/rpkid.py (3793)

13.208 rpki.rpkid.child_cert_obj Class Reference

Inheritance diagram for rpki.rpkid.child_cert_obj:

Collaboration diagram for rpki.rpkid.child_cert_obj:

Public Member Functions

- def __init__
- def ca_detail
- def child
- def fetch
- def published_callback
- def reissue
- def revoke
- def uri
- def uri_tail

Public Attributes

- ca_detail_id
- cert
- child_id
- gctx
- published

Static Public Attributes

- tuple sql_template

13.208.1 Detailed Description

```
Certificate that has been issued to a child.
```

Definition at line 1101 of file rpki/rpkid.py.

13.208.2 Constructor & Destructor Documentation

13.208.2.1 def rpki.rpkid.child_cert_obj.__init__ (*self*, *gctx* = `None`, *child_id* = `None`, *ca_detail_id* = `None`, *cert* = `None`)

```
Initialize a child_cert_obj.
```

Definition at line 1115 of file rpki/rpkid.py.

13.208.3 Member Function Documentation

13.208.3.1 def rpki.rpkid.child_cert_obj.ca_detail (*self*)

```
Fetch ca_detail object to which this child_cert object links.
```

Definition at line 1136 of file rpki/rpkid.py.

13.208.3.2 def rpki.rpkid.child_cert_obj.child (*self*)

```
Fetch child object to which this child_cert object links.
```

Definition at line 1129 of file rpki/rpkid.py.

13.208.3.3 def rpki.rpkid.child_cert_obj.fetch (*cls*, *gctx* = **None**, *child* = **None**, *ca_detail* = **None**, *ski* = **None**, *unique* = **False**)

```
Fetch all child_cert objects matching a particular set of
parameters.  This is a wrapper to consolidate various queries that
would otherwise be inline SQL WHERE expressions.  In most cases
code calls this indirectly, through methods in other classes.
```

Definition at line 1254 of file rpki/rpkid.py.

13.208.3.4 def rpki.rpkid.child_cert_obj.published_callback (*self*, *pdu*)

```
Publication callback: check result and mark published.
```

Definition at line 1286 of file rpki/rpkid.py.

13.208.3.5 def rpki.rpkid.child_cert_obj.reissue (*self*, *ca_detail*, *publisher*, *resources* = **None**, *sia* = **None**, *force* = **False**)

```
Reissue an existing child cert, reusing the public key.  If the
child cert we would generate is identical to the one we already
have, we just return the one we already have.  If we have to
revoke the old child cert when generating the new one, we have to
generate a new child_cert_obj, so calling code that needs the
updated child_cert_obj must use the return value from this method.
```

Definition at line 1172 of file rpki/rpkid.py.

13.208.3.6 def rpki.rpkid.child_cert_obj.revoke (*self, publisher, generate_crl_and_manifest* = **`False`**)

```
Revoke a child cert.
```

Definition at line 1156 of file rpki/rpkid.py.

13.208.3.7 def rpki.rpkid.child_cert_obj.uri (*self*)

```
Return the publication URI for this child_cert.
```

Definition at line 1150 of file rpki/rpkid.py.

13.208.3.8 def rpki.rpkid.child_cert_obj.uri_tail (*self*)

```
Return the tail (filename) portion of the URI for this child_cert.
```

Definition at line 1143 of file rpki/rpkid.py.

13.208.4 Member Data Documentation

13.208.4.1 rpki.rpkid.child_cert_obj.ca_detail_id

Definition at line 1117 of file rpki/rpkid.py.

13.208.4.2 rpki.rpkid.child_cert_obj.cert

Definition at line 1117 of file rpki/rpkid.py.

13.208.4.3 rpki.rpkid.child_cert_obj.child_id

Definition at line 1117 of file rpki/rpkid.py.

13.208.4.4 rpki.rpkid.child_cert_obj.gctx

Reimplemented from rpki.sql.sql_persistent.

Definition at line 1117 of file rpki/rpkid.py.

13.208.4.5 rpki.rpkid.child_cert_obj.published

Definition at line 1117 of file rpki/rpkid.py.

13.208.4.6 tuple rpki.rpkid.child_cert_obj.sql_template [static]

Initial value:

```
rpki.sql.template(
    "child_cert",
    "child_cert_id",
    ("cert", rpki.x509.X509),
    "child_id",
    "ca_detail_id",
    "ski",
    ("published", rpki.sundial.datetime))
```

Definition at line 1106 of file rpki/rpkid.py.

The documentation for this class was generated from the following file:

- rpki/rpkid.py (3793)

13.209 rpki.rpkid.ghostbuster_obj Class Reference

Inheritance diagram for rpki.rpkid.ghostbuster_obj:

Collaboration diagram for rpki.rpkid.ghostbuster_obj:

Public Member Functions

- def __init__
- def ca_detail
- def generate
- def published_callback
- def regenerate
- def revoke
- def self
- def update
- def uri
- def uri_from_key
- def uri_tail

Public Attributes

- gctx
- self_id

Static Public Attributes

- ca_detail_id = None
- cert = None
- ghostbuster = None
- published = None
- tuple sql_template
- vcard = None

13.209.1 Detailed Description

```
Ghostbusters record.
```

Definition at line 1607 of file rpki/rpkid.py.

13.209.2 Constructor & Destructor Documentation

13.209.2.1 def rpki.rpkid.ghostbuster_obj.__init__ (*self*, *gctx* = **None**, *self_id* = **None**, *ca_detail_id* = **None**, *vcard* = **None**)

Definition at line 1642 of file rpki/rpkid.py.

13.209.3 Member Function Documentation

13.209.3.1 def rpki.rpkid.ghostbuster_obj.ca_detail (*self*)

```
Fetch ca_detail object to which this ghostbuster_obj links.
```

Definition at line 1636 of file rpki/rpkid.py.

13.209.3.2 def rpki.rpkid.ghostbuster_obj.generate (*self, publisher, fast* = ***False***)

```
Generate a Ghostbuster record

Once we have the right covering certificate, we generate the
ghostbuster payload, generate a new EE certificate, use the EE
certificate to sign the ghostbuster payload, publish the result,
then throw away the private key for the EE cert.  This is modeled
after the way we handle ROAs.

If fast is set, we leave generating the new manifest for our
caller to handle, presumably at the end of a bulk operation.
```

Definition at line 1667 of file rpki/rpkid.py.

13.209.3.3 def rpki.rpkid.ghostbuster_obj.published_callback (*self, pdu*)

```
Check publication result.
```

Definition at line 1701 of file rpki/rpkid.py.

13.209.3.4 def rpki.rpkid.ghostbuster_obj.regenerate (*self, publisher, fast* = ***False***)

```
Reissue Ghostbuster associated with this ghostbuster_obj.
```

Definition at line 1744 of file rpki/rpkid.py.

13.209.3.5 def rpki.rpkid.ghostbuster_obj.revoke (*self, publisher, regenerate = False, allow_failure = False, fast = False*)

```
Withdraw Ghostbuster associated with this ghostbuster_obj.

In order to preserve make-before-break properties without
duplicating code, this method also handles generating a
replacement ghostbuster when requested.

If allow_failure is set, failing to withdraw the ghostbuster will not be
considered an error.

If fast is set, SQL actions will be deferred, on the assumption
that our caller will handle regenerating CRL and manifest and
flushing the SQL cache.
```

Definition at line 1709 of file rpki/rpkid.py.

13.209.3.6 def rpki.rpkid.ghostbuster_obj.self (*self*)

```
Fetch self object to which this ghostbuster_obj links.
```

Definition at line 1629 of file rpki/rpkid.py.

13.209.3.7 def rpki.rpkid.ghostbuster_obj.update (*self, publisher, fast = False*)

```
Bring this ghostbuster_obj up to date if necesssary.
```

Definition at line 1652 of file rpki/rpkid.py.

13.209.3.8 def rpki.rpkid.ghostbuster_obj.uri (*self*)

```
Return the publication URI for this ghostbuster_obj's ghostbuster.
```

Definition at line 1760 of file rpki/rpkid.py.

13.209.3.9 def rpki.rpkid.ghostbuster_obj.uri_from_key (*self, key*)

```
Return publication URI for a public key.
```

Definition at line 1753 of file rpki/rpkid.py.

13.209.3.10 def rpki.rpkid.ghostbuster_obj.uri_tail (*self*)

```
Return the tail (filename portion) of the publication URI for this
ghostbuster_obj's ghostbuster.
```

Definition at line 1767 of file rpki/rpkid.py.

13.209.4 Member Data Documentation

13.209.4.1 rpki.rpkid.ghostbuster_obj.ca_detail_id = None [static]

Definition at line 1622 of file rpki/rpkid.py.

13.209.4.2 rpki.rpkid.ghostbuster_obj.cert = None [static]

Definition at line 1623 of file rpki/rpkid.py.

13.209.4.3 rpki.rpkid.ghostbuster_obj.gctx

Reimplemented from rpki.sql.sql_persistent.

Definition at line 1642 of file rpki/rpkid.py.

13.209.4.4 rpki.rpkid.ghostbuster_obj.ghostbuster = None [static]

Definition at line 1624 of file rpki/rpkid.py.

13.209.4.5 rpki.rpkid.ghostbuster_obj.published = None [static]

Definition at line 1625 of file rpki/rpkid.py.

13.209.4.6 rpki.rpkid.ghostbuster_obj.self_id

Definition at line 1642 of file rpki/rpkid.py.

13.209.4.7 tuple rpki.rpkid.ghostbuster_obj.sql_template [static]

Initial value:

```
rpki.sql.template(
    "ghostbuster",
    "ghostbuster_id",
    "ca_detail_id",
    "self_id",
    "vcard",
    ("ghostbuster", rpki.x509.Ghostbuster),
    ("cert", rpki.x509.X509),
    ("published", rpki.sundial.datetime))
```

Definition at line 1612 of file rpki/rpkid.py.

13.209.4.8 rpki.rpkid.ghostbuster_obj.vcard = None [static]

Definition at line 1626 of file rpki/rpkid.py.

The documentation for this class was generated from the following file:

- rpki/rpkid.py (3793)

13.210 rpki.rpkid.main Class Reference

Inheritance diagram for rpki.rpkid.main:

Collaboration diagram for rpki.rpkid.main:

Public Member Functions

- def __init__
- def checkpoint
- def cron
- def cronjob_handler
- def irdb_query
- def irdb_query_child_resources
- def irdb_query_ghostbuster_requests
- def irdb_query_roa_requests
- def left_right_handler
- def main
- def start_cron
- def up_down_handler

Public Attributes

- bpki_ta
- cfg
- cfg_file
- cron_keepalive
- cron_period
- cron_timeout
- cron_timer
- http_server_host
- http_server_port
- initial_delay
- irbe_cert
- irdb_cert
- irdb_url
- profile
- publication_kludge_base
- rpkid_cert
- rpkid_key
- sql
- use_internal_cron

Static Public Attributes

- tuple up_down_url_regexp = re.compile("/up-down/([-A-Z0-9_]+)/([-A-Z0-9_-]+)$", re.I)

13.210.1 Detailed Description

```
Main program for rpkid.
```

Definition at line 43 of file rpki/rpkid.py.

13.210.2 Constructor & Destructor Documentation

13.210.2.1 def rpki.rpkid.main.__init__ (*self*)

Definition at line 48 of file rpki/rpkid.py.

13.210.2.2 def rpki.rpkid.main.main (*self*)

Definition at line 78 of file rpki/rpkid.py.

13.210.3 Member Function Documentation

13.210.3.1 def rpki.rpkid.main.checkpoint (*self*)

```
Record that we were still alive when we got here, by resetting
keepalive timer.
```

Definition at line 280 of file rpki/rpkid.py.

13.210.3.2 def rpki.rpkid.main.cron (*self, cb = None*)

```
Periodic tasks.
```

Definition at line 288 of file rpki/rpkid.py.

13.210.3.3 def rpki.rpkid.main.cronjob_handler (*self, query, path, cb*)

```
External trigger for periodic tasks.  This is somewhat obsolete
now that we have internal timers, but the test framework still
uses it.
```

Definition at line 345 of file rpki/rpkid.py.

13.210.3.4 def rpki.rpkid.main.irdb_query (*self, callback, errback, q_pdus, kwargs*)

```
Perform an IRDB callback query.
```

Definition at line 141 of file rpki/rpkid.py.

13.210.3.5 def rpki.rpkid.main.irdb_query_child_resources (*self, self_handle, child_handle, callback, errback*)

```
Ask IRDB about a child's resources.
```

Definition at line 174 of file rpki/rpkid.py.

13.210.3.6 def rpki.rpkid.main.irdb_query_ghostbuster_requests (*self, self_handle, parent_handles, callback, errback*)

```
Ask IRDB about self's ghostbuster record requests.
```

Definition at line 206 of file rpki/rpkid.py.

13.210.3.7 def rpki.rpkid.main.irdb_query_roa_requests (*self, self_handle, callback, errback*)

```
Ask IRDB about self's ROA requests.
```

Definition at line 194 of file rpki/rpkid.py.

13.210.3.8 def rpki.rpkid.main.left_right_handler (*self, query, path, cb*)

```
Process one left-right PDU.
```

Definition at line 223 of file rpki/rpkid.py.

13.210.3.9 def rpki.rpkid.main.start_cron (*self*)

```
Start clock for rpkid's internal cron process.
```

Definition at line 128 of file rpki/rpkid.py.

13.210.3.10 def rpki.rpkid.main.up_down_handler (*self, query, path, cb*)

```
Process one up-down PDU.
```

Definition at line 249 of file rpki/rpkid.py.

13.210.4 Member Data Documentation

13.210.4.1 rpki.rpkid.main.bpki_ta

Definition at line 78 of file rpki/rpkid.py.

13.210.4.2 rpki.rpkid.main.cfg

Definition at line 78 of file rpki/rpkid.py.

13.210.4.3 rpki.rpkid.main.cfg_file

Definition at line 48 of file rpki/rpkid.py.

13.210.4.4 rpki.rpkid.main.cron_keepalive

Definition at line 78 of file rpki/rpkid.py.

13.210.4.5 rpki.rpkid.main.cron_period

Definition at line 78 of file rpki/rpkid.py.

13.210.4.6 rpki.rpkid.main.cron_timeout

Definition at line 78 of file rpki/rpkid.py.

13.210.4.7 rpki.rpkid.main.cron_timer

Definition at line 130 of file rpki/rpkid.py.

13.210.4.8 rpki.rpkid.main.http_server_host

Definition at line 78 of file rpki/rpkid.py.

13.210.4.9 rpki.rpkid.main.http_server_port

Definition at line 78 of file rpki/rpkid.py.

13.210.4.10 rpki.rpkid.main.initial_delay

Definition at line 78 of file rpki/rpkid.py.

13.210.4.11 rpki.rpkid.main.irbe_cert

Definition at line 78 of file rpki/rpkid.py.

13.210.4.12 rpki.rpkid.main.irdb_cert

Definition at line 78 of file rpki/rpkid.py.

13.210.4.13 rpki.rpkid.main.irdb_url

Definition at line 78 of file rpki/rpkid.py.

13.210.4.14 rpki.rpkid.main.profile

Definition at line 48 of file rpki/rpkid.py.

13.210.4.15 rpki.rpkid.main.publication_kludge_base

Definition at line 78 of file rpki/rpkid.py.

13.210.4.16 rpki.rpkid.main.rpkid_cert

Definition at line 78 of file rpki/rpkid.py.

13.210.4.17 rpki.rpkid.main.rpkid_key

Definition at line 78 of file rpki/rpkid.py.

13.210.4.18 rpki.rpkid.main.sql

Definition at line 78 of file rpki/rpkid.py.

13.210.4.19 tuple rpki.rpkid.main.up_down_url_regexp = re.compile("/up-down/([-A-Z0-9_]+)/([-A-Z0-9_]+)$", re.I) [static]

Definition at line 247 of file rpki/rpkid.py.

13.210.4.20 rpki.rpkid.main.use_internal_cron

Definition at line 78 of file rpki/rpkid.py.

The documentation for this class was generated from the following file:

- rpki/rpkid.py (3793)

13.211 rpki.rpkid.publication_queue Class Reference

Inheritance diagram for rpki.rpkid.publication_queue:

Collaboration diagram for rpki.rpkid.publication_queue:

Public Member Functions

- def __init__
- def call_pubd
- def publish
- def withdraw

Public Attributes

- handlers

- msgs
- repositories
- uris

Static Public Attributes

- replace = True

Private Member Functions

- def _add

13.211.1 Detailed Description

```
Utility to simplify publication from within rpkid.

General idea here is to accumulate a collection of objects to be
published, in one or more repositories, each potentially with its
own completion callback.  Eventually we want to publish everything
we've accumulated, at which point we need to iterate over the
collection and do repository.call_pubd() for each repository.
```

Definition at line 1775 of file rpki/rpkid.py.

13.211.2 Constructor & Destructor Documentation

13.211.2.1 def rpki.rpkid.publication_queue.__init__ (*self*)

Definition at line 1788 of file rpki/rpkid.py.

13.211.3 Member Function Documentation

13.211.3.1 def rpki.rpkid.publication_queue._add (*self, uri, obj, repository, handler, make_pdu*) **[private]**

Definition at line 1795 of file rpki/rpkid.py.

13.211.3.2 def rpki.rpkid.publication_queue.call_pubd (*self, cb, eb*)

Definition at line 1817 of file rpki/rpkid.py.

13.211.3.3 def rpki.rpkid.publication_queue.publish (*self, cls, uri, obj, repository, handler* = `None`)

Definition at line 1811 of file rpki/rpkid.py.

13.211.3.4 def rpki.rpkid.publication_queue.withdraw (*self, cls, uri, obj, repository, handler* = `None`)

Definition at line 1814 of file rpki/rpkid.py.

13.211.4 Member Data Documentation

13.211.4.1 rpki.rpkid.publication_queue.handlers

Definition at line 1788 of file rpki/rpkid.py.

13.211.4.2 rpki.rpkid.publication_queue.msgs

Definition at line 1788 of file rpki/rpkid.py.

13.211.4.3 rpki.rpkid.publication_queue.replace = True `[static]`

Definition at line 1786 of file rpki/rpkid.py.

13.211.4.4 rpki.rpkid.publication_queue.repositories

Definition at line 1788 of file rpki/rpkid.py.

13.211.4.5 rpki.rpkid.publication_queue.uris

Definition at line 1788 of file rpki/rpkid.py.

The documentation for this class was generated from the following file:

- rpki/rpkid.py (3793)

13.212 rpki.rpkid.revoked_cert_obj Class Reference

Inheritance diagram for rpki.rpkid.revoked_cert_obj:

Collaboration diagram for rpki.rpkid.revoked_cert_obj:

Public Member Functions

- def __init__
- def ca_detail
- def revoke

Public Attributes

- ca_detail_id
- expires
- gctx
- revoked
- serial

Static Public Attributes

- tuple sql_template

13.212.1 Detailed Description

```
Tombstone for a revoked certificate.
```

Definition at line 1294 of file rpki/rpkid.py.

13.212.2 Constructor & Destructor Documentation

13.212.2.1 def rpki.rpkid.revoked_cert_obj.__init__ (*self*, *gctx* = `None`, *serial* = `None`, *revoked* = `None`, *expires* = `None`, *ca_detail_id* = `None`)

```
Initialize a revoked_cert_obj.
```

Definition at line 1307 of file rpki/rpkid.py.

13.212.3 Member Function Documentation

13.212.3.1 def rpki.rpkid.revoked_cert_obj.ca_detail (*self*)

```
Fetch ca_detail object to which this revoked_cert_obj links.
```

Definition at line 1321 of file rpki/rpkid.py.

13.212.3.2 def rpki.rpkid.revoked_cert_obj.revoke (*cls, cert, ca_detail*)

```
Revoke a certificate.
```

Definition at line 1328 of file rpki/rpkid.py.

13.212.4 Member Data Documentation

13.212.4.1 rpki.rpkid.revoked_cert_obj.ca_detail_id

Definition at line 1309 of file rpki/rpkid.py.

13.212.4.2 rpki.rpkid.revoked_cert_obj.expires

Definition at line 1309 of file rpki/rpkid.py.

13.212.4.3 rpki.rpkid.revoked_cert_obj.gctx

Reimplemented from rpki.sql.sql_persistent.

Definition at line 1309 of file rpki/rpkid.py.

13.212.4.4 rpki.rpkid.revoked_cert_obj.revoked

Definition at line 1309 of file rpki/rpkid.py.

13.212.4.5 rpki.rpkid.revoked_cert_obj.serial

Definition at line 1309 of file rpki/rpkid.py.

13.212.4.6 tuple rpki.rpkid.revoked_cert_obj.sql_template [static]

Initial value:

```
rpki.sql.template(
    "revoked_cert",
    "revoked_cert_id",
    "serial",
    "ca_detail_id",
    ("revoked", rpki.sundial.datetime),
    ("expires", rpki.sundial.datetime))
```

Definition at line 1299 of file rpki/rpkid.py.

The documentation for this class was generated from the following file:

- rpki/rpkid.py (3793)

13.213 rpki.rpkid.roa_obj Class Reference

Inheritance diagram for rpki.rpkid.roa_obj:

Collaboration diagram for rpki.rpkid.roa_obj:

Public Member Functions

- def __init__
- def __repr__
- def ca_detail
- def generate
- def published_callback
- def regenerate
- def revoke
- def self
- def sql_delete_hook
- def sql_fetch_hook
- def sql_insert_hook
- def update
- def uri
- def uri_from_key
- def uri_tail

Public Attributes

- asn
- gctx
- ipv4
- ipv6
- self_id

Static Public Attributes

- ca_detail_id = None
- cert = None
- published = None
- roa = None
- tuple sql_template

13.213.1 Detailed Description

```
Route Origin Authorization.
```

Definition at line 1339 of file rpki/rpkid.py.

13.213.2 Constructor & Destructor Documentation

13.213.2.1 def rpki.rpkid.roa_obj.__init__ (*self, gctx = None, self_id = None, asn = None, ipv4 = None, ipv6 = None*)

Definition at line 1412 of file rpki/rpkid.py.

13.213.3 Member Function Documentation

13.213.3.1 def rpki.rpkid.roa_obj.__repr__ (*self*)

Definition at line 1407 of file rpki/rpkid.py.

13.213.3.2 def rpki.rpkid.roa_obj.ca_detail (*self*)

```
Fetch ca_detail object to which this roa_obj links.
```

Definition at line 1367 of file rpki/rpkid.py.

13.213.3.3 def rpki.rpkid.roa_obj.generate (*self, publisher, fast = False*)

```
Generate a ROA.

At present we have no way of performing a direct lookup from a
desired set of resources to a covering certificate, so we have to
search.  This could be quite slow if we have a lot of active
ca_detail objects.  Punt on the issue for now, revisit if
profiling shows this as a hotspot.

Once we have the right covering certificate, we generate the ROA
payload, generate a new EE certificate, use the EE certificate to
sign the ROA payload, publish the result, then throw away the
private key for the EE cert, all per the ROA specification.  This
implies that generating a lot of ROAs will tend to thrash
/dev/random, but there is not much we can do about that.

If fast is set, we leave generating the new manifest for our
caller to handle, presumably at the end of a bulk operation.
```

Definition at line 1464 of file rpki/rpkid.py.

13.213.3.4 def rpki.rpkid.roa_obj.published_callback (*self, pdu*)

```
Check publication result.
```

Definition at line 1531 of file rpki/rpkid.py.

13.213.3.5 def rpki.rpkid.roa_obj.regenerate (*self, publisher, fast* = **False**)

```
Reissue ROA associated with this roa_obj.
```

Definition at line 1576 of file rpki/rpkid.py.

13.213.3.6 def rpki.rpkid.roa_obj.revoke (*self, publisher, regenerate* = **False**, *allow_failure* = **False**, *fast* = **False**)

```
Withdraw ROA associated with this roa_obj.

In order to preserve make-before-break properties without
duplicating code, this method also handles generating a
replacement ROA when requested.

If allow_failure is set, failing to withdraw the ROA will not be
considered an error.

If fast is set, SQL actions will be deferred, on the assumption
that our caller will handle regenerating CRL and manifest and
flushing the SQL cache.
```

Definition at line 1539 of file rpki/rpkid.py.

13.213.3.7 def rpki.rpkid.roa_obj.self (*self*)

```
Fetch self object to which this roa_obj links.
```

Definition at line 1360 of file rpki/rpkid.py.

13.213.3.8 def rpki.rpkid.roa_obj.sql_delete_hook (*self*)

```
Extra SQL delete actions for roa_obj -- handle prefix lists.
```

Reimplemented from rpki.sql.sql_persistent.

Definition at line 1401 of file rpki/rpkid.py.

13.213.3.9 def rpki.rpkid.roa_obj.sql_fetch_hook (*self*)

```
Extra SQL fetch actions for roa_obj -- handle prefix lists.
```

Reimplemented from rpki.sql.sql_persistent.

Definition at line 1373 of file rpki/rpkid.py.

13.213.3.10 def rpki.rpkid.roa_obj.sql_insert_hook (*self*)

```
Extra SQL insert actions for roa_obj -- handle prefix lists.
```

Reimplemented from rpki.sql.sql_persistent.

Definition at line 1387 of file rpki/rpkid.py.

13.213.3.11 def rpki.rpkid.roa_obj.update (*self, publisher, fast* = **`False`**)

```
Bring this roa_obj's ROA up to date if necesssary.
```

Definition at line 1425 of file rpki/rpkid.py.

13.213.3.12 def rpki.rpkid.roa_obj.uri (*self*)

```
Return the publication URI for this roa_obj's ROA.
```

Definition at line 1592 of file rpki/rpkid.py.

13.213.3.13 def rpki.rpkid.roa_obj.uri_from_key (*self, key*)

```
Return publication URI for a public key.
```

Definition at line 1585 of file rpki/rpkid.py.

13.213.3.14 def rpki.rpkid.roa_obj.uri_tail (*self*)

```
Return the tail (filename portion) of the publication URI for this
roa_obj's ROA.
```

Definition at line 1599 of file rpki/rpkid.py.

13.213.4 Member Data Documentation

13.213.4.1 rpki.rpkid.roa_obj.asn

Definition at line 1412 of file rpki/rpkid.py.

13.213.4.2 rpki.rpkid.roa_obj.ca_detail_id = None [static]

Definition at line 1354 of file rpki/rpkid.py.

13.213.4.3 rpki.rpkid.roa_obj.cert = None [static]

Definition at line 1355 of file rpki/rpkid.py.

13.213.4.4 rpki.rpkid.roa_obj.gctx

Reimplemented from rpki.sql.sql_persistent.

Definition at line 1412 of file rpki/rpkid.py.

13.213.4.5 rpki.rpkid.roa_obj.ipv4

Definition at line 1412 of file rpki/rpkid.py.

13.213.4.6 rpki.rpkid.roa_obj.ipv6

Definition at line 1412 of file rpki/rpkid.py.

13.213.4.7 rpki.rpkid.roa_obj.published = None [static]

Definition at line 1357 of file rpki/rpkid.py.

13.213.4.8 rpki.rpkid.roa_obj.roa = None [static]

Definition at line 1356 of file rpki/rpkid.py.

13.213.4.9 rpki.rpkid.roa_obj.self_id

Definition at line 1412 of file rpki/rpkid.py.

13.213.4.10 tuple rpki.rpkid.roa_obj.sql_template [static]

Initial value:

```
rpki.sql.template(
    "roa",
    "roa_id",
    "ca_detail_id",
    "self_id",
    "asn",
    ("roa", rpki.x509.ROA),
    ("cert", rpki.x509.X509),
    ("published", rpki.sundial.datetime))
```

Definition at line 1344 of file rpki/rpkid.py.

The documentation for this class was generated from the following file:

- rpki/rpkid.py (3793)

13.214 rpki.sql.session Class Reference

Inheritance diagram for rpki.sql.session:

Collaboration diagram for rpki.sql.session:

Public Member Functions

- def __init__
- def assert_pristine
- def cache_clear
- def close
- def connect
- def execute
- def executemany
- def fetchall
- def lastrowid
- def ping
- def sweep

Public Attributes

- cache
- cur
- database
- db
- dirty
- password
- username

Private Member Functions

- def _wrap_execute

Static Private Attributes

- _exceptions_enabled = False

13.214.1 Detailed Description

```
SQL session layer.
```

Definition at line 50 of file sql.py.

13.214.2 Constructor & Destructor Documentation

13.214.2.1 def rpki.sql.session.__init__ (*self, cfg*)

Definition at line 57 of file sql.py.

13.214.3 Member Function Documentation

13.214.3.1 def rpki.sql.session._wrap_execute (*self, func, query, args*) [private]

Definition at line 88 of file sql.py.

13.214.3.2 def rpki.sql.session.assert_pristine (*self*)

```
Assert that there are no dirty objects in the cache.
```

Definition at line 114 of file sql.py.

13.214.3.3 def rpki.sql.session.cache_clear (*self*)

```
Clear the object cache.
```

Definition at line 108 of file sql.py.

13.214.3.4 def rpki.sql.session.close (*self*)

Definition at line 77 of file sql.py.

13.214.3.5 def rpki.sql.session.connect (*self*)

Definition at line 72 of file sql.py.

13.214.3.6 def rpki.sql.session.execute (*self, query, args* = `None`)

Definition at line 96 of file sql.py.

13.214.3.7 def rpki.sql.session.executemany (*self, query, args*)

Definition at line 99 of file sql.py.

13.214.3.8 def rpki.sql.session.fetchall (*self*)

Definition at line 102 of file sql.py.

13.214.3.9 def rpki.sql.session.lastrowid (*self*)

Definition at line 105 of file sql.py.

13.214.3.10 def rpki.sql.session.ping (*self*)

Definition at line 85 of file sql.py.

13.214.3.11 def rpki.sql.session.sweep (*self*)

```
Write any dirty objects out to SQL.
```

Definition at line 120 of file sql.py.

13.214.4 Member Data Documentation

13.214.4.1 rpki.sql.session._exceptions_enabled = False [static, private]

Definition at line 55 of file sql.py.

13.214.4.2 rpki.sql.session.cache

Definition at line 57 of file sql.py.

13.214.4.3 rpki.sql.session.cur

Definition at line 72 of file sql.py.

13.214.4.4 rpki.sql.session.database

Definition at line 57 of file sql.py.

13.214.4.5 rpki.sql.session.db

Definition at line 72 of file sql.py.

13.214.4.6 rpki.sql.session.dirty

Definition at line 57 of file sql.py.

13.214.4.7 rpki.sql.session.password

Definition at line 57 of file sql.py.

13.214.4.8 rpki.sql.session.username

Definition at line 57 of file sql.py.

The documentation for this class was generated from the following file:

- sql.py (3551)

13.215 rpki.sql.sql_persistent Class Reference

Inheritance diagram for rpki.sql.sql_persistent:

Collaboration diagram for rpki.sql.sql_persistent:

Public Member Functions

- def sql_decode
- def sql_delete
- def sql_delete_hook
- def sql_encode
- def sql_fetch
- def sql_fetch_all
- def sql_fetch_hook
- def sql_fetch_where
- def sql_fetch_where1
- def sql_init
- def sql_insert_hook
- def sql_is_dirty
- def sql_mark_clean
- def sql_mark_deleted
- def sql_mark_dirty
- def sql_store
- def sql_update_hook

Public Attributes

- gctx

Static Public Attributes

- sql_debug = False

  Enable logging of SQL actions.

- sql_deleted = False

  Whether our cached copy of this object has been deleted.

- sql_in_db = False

  Whether this object is already in SQL or not.

13.215.1 Detailed Description

```
Mixin for persistent class that needs to be stored in SQL.
```

Definition at line 158 of file sql.py.

13.215.2 Member Function Documentation

13.215.2.1 def rpki.sql.sql_persistent.sql_decode (*self, vals*)

```
Initialize an object with values returned by self.sql_fetch().
This is a default version that assumes a one-to-one mapping
between column names in SQL and attribute names in Python.  If you
need something fancier, override this.
```

Reimplemented in rpki.rpkid.ca_detail_obj.

Definition at line 339 of file sql.py.

13.215.2.2 def rpki.sql.sql_persistent.sql_delete (*self*)

```
Delete this object from SQL.
```

Definition at line 310 of file sql.py.

13.215.2.3 def rpki.sql.sql_persistent.sql_delete_hook (*self*)

```
Customization hook.
```

Reimplemented in rpki.rpkid.roa_obj.

Definition at line 371 of file sql.py.

13.215.2.4 def rpki.sql.sql_persistent.sql_encode (*self*)

```
Convert object attributes into a dict for use with canned SQL
queries.  This is a default version that assumes a one-to-one
mapping between column names in SQL and attribute names in Python.
If you need something fancier, override this.
```

Definition at line 326 of file sql.py.

13.215.2.5 def rpki.sql.sql_persistent.sql_fetch (*cls, gctx, id*)

```
Fetch one object from SQL, based on its primary key.

Since in this one case we know that the primary index is also the
cache key, we check for a cache hit directly in the hope of
bypassing the SQL lookup entirely.

This method is usually called via a one-line class-specific
wrapper.  As a convenience, we also accept an id of None, and just
return None in this case.
```

Definition at line 179 of file sql.py.

13.215.2.6 def rpki.sql.sql_persistent.sql_fetch_all (*cls, gctx*)

```
Fetch all objects of this type from SQL.
```

Definition at line 217 of file sql.py.

13.215.2.7 def rpki.sql.sql_persistent.sql_fetch_hook (*self*)

```
Customization hook.
```

Reimplemented in rpki.rpkid.roa_obj.

Definition at line 352 of file sql.py.

13.215.2.8 def rpki.sql.sql_persistent.sql_fetch_where (*cls, gctx, where, args = None, also_from = None*)

```
Fetch objects of this type matching an arbitrary SQL WHERE expression.
```

Definition at line 224 of file sql.py.

13.215.2.9 def rpki.sql.sql_persistent.sql_fetch_where1 (*cls, gctx, where, args = None, also_from = None*)

```
Fetch one object from SQL, based on an arbitrary SQL WHERE expression.
```

Definition at line 202 of file sql.py.

13.215.2.10 def rpki.sql.sql_persistent.sql_init (*cls, gctx, row, key*)

```
Initialize one Python object from the result of a SQL query.
```

Definition at line 251 of file sql.py.

13.215.2.11 def rpki.sql.sql_persistent.sql_insert_hook (*self*)

```
Customization hook.
```

Reimplemented in rpki.rpkid.roa_obj.

Definition at line 358 of file sql.py.

13.215.2.12 def rpki.sql.sql_persistent.sql_is_dirty (*self*)

```
Query whether this object needs to be written back to SQL.
```

Definition at line 275 of file sql.py.

13.215.2.13 def rpki.sql.sql_persistent.sql_mark_clean (*self*)

```
Mark this object as not needing to be written back to SQL.
```

Definition at line 269 of file sql.py.

13.215.2.14 def rpki.sql.sql_persistent.sql_mark_deleted (*self*)

```
Mark this object as needing to be deleted in SQL.
```

Definition at line 281 of file sql.py.

13.215.2.15 def rpki.sql.sql_persistent.sql_mark_dirty (*self*)

```
Mark this object as needing to be written back to SQL.
```

Definition at line 263 of file sql.py.

13.215.2.16 def rpki.sql.sql_persistent.sql_store (*self*)

```
Store this object to SQL.
```

Definition at line 288 of file sql.py.

13.215.2.17 def rpki.sql.sql_persistent.sql_update_hook (*self*)

```
Customization hook.
```

Definition at line 364 of file sql.py.

13.215.3 Member Data Documentation

13.215.3.1 rpki.sql.sql_persistent.gctx

Reimplemented in rpki.rpkid.ca_obj, rpki.rpkid.ca_detail_obj, rpki.rpkid.child_cert_-obj, rpki.rpkid.revoked_cert_obj, rpki.rpkid.roa_obj, and rpki.rpkid.ghostbuster_obj.

Definition at line 253 of file sql.py.

13.215.3.2 rpki::sql.sql_persistent::sql_debug = False [static]

Enable logging of SQL actions.

Definition at line 176 of file sql.py.

13.215.3.3 rpki::sql.sql_persistent::sql_deleted = False [static]

Whether our cached copy of this object has been deleted.

Definition at line 171 of file sql.py.

13.215.3.4 rpki::sql.sql_persistent::sql_in_db = False [static]

Whether this object is already in SQL or not.

Definition at line 166 of file sql.py.

The documentation for this class was generated from the following file:

- sql.py (3551)

13.216 rpki.sql.template Class Reference

Inheritance diagram for rpki.sql.template:

Collaboration diagram for rpki.sql.template:

Public Member Functions

- def __init__

Public Attributes

- columns
- delete
- index
- insert
- map

- select
- table
- update

13.216.1 Detailed Description

```
SQL template generator.
```

Definition at line 132 of file sql.py.

13.216.2 Constructor & Destructor Documentation

13.216.2.1 def rpki.sql.template.__init__ (*self, table_name, index_column, data_columns*)

```
Build a SQL template.
```

Definition at line 137 of file sql.py.

13.216.3 Member Data Documentation

13.216.3.1 rpki.sql.template.columns

Definition at line 139 of file sql.py.

13.216.3.2 rpki.sql.template.delete

Definition at line 139 of file sql.py.

13.216.3.3 rpki.sql.template.index

Definition at line 139 of file sql.py.

13.216.3.4 rpki.sql.template.insert

Definition at line 139 of file sql.py.

13.216.3.5 rpki.sql.template.map

Definition at line 139 of file sql.py.

13.216.3.6 rpki.sql.template.select

Definition at line 139 of file sql.py.

13.216.3.7 rpki.sql.template.table

Definition at line 139 of file sql.py.

13.216.3.8 rpki.sql.template.update

Definition at line 139 of file sql.py.

The documentation for this class was generated from the following file:

- sql.py (3551)

13.217 rpki.sundial.datetime Class Reference

Inheritance diagram for rpki.sundial.datetime:

Collaboration diagram for rpki.sundial.datetime:

Public Member Functions

- def __add__
- def __radd__
- def __rsub__
- def __str__
- def __sub__
- def earlier
- def from_sql
- def fromASN1tuple
- def fromdatetime
- def fromGeneralizedTime
- def fromOpenSSL
- def fromUTCTime
- def fromXMLtime
- def later
- def to_sql
- def toASN1tuple
- def toGeneralizedTime
- def totimestamp
- def toUTCTime
- def toXMLtime

Static Public Attributes

- tuple PKIX_threshhold = pydatetime.datetime(2050, 1, 1)

  Threshold specified in RFC 3280 for switchover from UTCTime to GeneralizedTime.

13.217.1 Detailed Description

```
RPKI extensions to standard datetime.datetime class.  All work here
is in UTC, so we use naive datetime objects.
```

Definition at line 56 of file sundial.py.

13.217.2 Member Function Documentation

13.217.2.1 def rpki.sundial.datetime.__add__ (*self, y*)

Definition at line 192 of file sundial.py.

13.217.2.2 def rpki.sundial.datetime.__radd__ (*self, y*)

Definition at line 193 of file sundial.py.

13.217.2.3 def rpki.sundial.datetime.__rsub__ (*self, y*)

Definition at line 194 of file sundial.py.

13.217.2.4 def rpki.sundial.datetime.__str__ (*self*)

Definition at line 137 of file sundial.py.

13.217.2.5 def rpki.sundial.datetime.__sub__ (*self, y*)

Definition at line 195 of file sundial.py.

13.217.2.6 def rpki.sundial.datetime.earlier (*self, other*)

```
Return the earlier of two timestamps.
```

Definition at line 186 of file sundial.py.

13.217.2.7 def rpki.sundial.datetime.from_sql (*cls, x*)

```
Convert from SQL storage format.
```

Definition at line 159 of file sundial.py.

13.217.2.8 def rpki.sundial.datetime.fromASN1tuple (*cls, x*)

```
Convert from ASN.1 tuple representation.
```

Definition at line 97 of file sundial.py.

13.217.2.9 def rpki.sundial.datetime.fromdatetime (*cls, x*)

```
Convert a datetime.datetime object into this subclass.  This is
whacky due to the weird constructors for datetime.
```

Definition at line 141 of file sundial.py.

13.217.2.10 def rpki.sundial.datetime.fromGeneralizedTime (*cls, x*)

```
Convert from ASN.1 GeneralizedTime.
```

Definition at line 84 of file sundial.py.

13.217.2.11 def rpki.sundial.datetime.fromOpenSSL (*cls, x*)

```
Convert from the format OpenSSL's command line tool uses into this
subclass.  May require rewriting if we run into locale problems.
```

Definition at line 149 of file sundial.py.

13.217.2.12 def rpki.sundial.datetime.fromUTCTime (*cls, x*)

```
Convert from ASN.1 UTCTime.
```

Definition at line 70 of file sundial.py.

13.217.2.13 def rpki.sundial.datetime.fromXMLtime (*cls, x*)

```
Convert from XML time representation.
```

Definition at line 122 of file sundial.py.

13.217.2.14 def rpki.sundial.datetime.later (*self, other*)

```
Return the later of two timestamps.
```

Definition at line 180 of file sundial.py.

13.217.2.15 def rpki.sundial.datetime.to_sql (*self*)

```
Convert to SQL storage format.

There's something whacky going on in the MySQLdb module, it throws
range errors when storing a derived type into a DATETIME column.
Investigate some day, but for now brute force this by copying the
relevant fields into a datetime.datetime for MySQLdb's
consumption.
```

Definition at line 165 of file sundial.py.

13.217.2.16 def rpki.sundial.datetime.toASN1tuple (*self*)

```
Convert to ASN.1 tuple representation.
```

Definition at line 112 of file sundial.py.

13.217.2.17 def rpki.sundial.datetime.toGeneralizedTime (*self*)

```
Convert to ASN.1 GeneralizedTime.
```

Definition at line 90 of file sundial.py.

13.217.2.18 def rpki.sundial.datetime.totimestamp (*self*)

```
Convert to seconds from epoch (like time.time()).  Conversion
method is a bit silly, but avoids time module timezone whackiness.
```

Definition at line 62 of file sundial.py.

13.217.2.19 def rpki.sundial.datetime.toUTCTime (*self*)

```
Convert to ASN.1 UTCTime.
```

Definition at line 77 of file sundial.py.

13.217.2.20 def rpki.sundial.datetime.toXMLtime (*self*)

```
Convert to XML time representation.
```

Definition at line 131 of file sundial.py.

13.217.3 Member Data Documentation

13.217.3.1 rpki::sundial.datetime::PKIX_threshhold = pydatetime.datetime(2050, 1, 1) [static]

Threshold specified in RFC 3280 for switchover from UTCTime to GeneralizedTime.

Definition at line 110 of file sundial.py.

The documentation for this class was generated from the following file:

- sundial.py (3783)

13.218 rpki.sundial.timedelta Class Reference

Inheritance diagram for rpki.sundial.timedelta:

Collaboration diagram for rpki.sundial.timedelta:

Public Member Functions

- def __abs__
- def __add__
- def __div__
- def __floordiv__
- def __mul__
- def __neg__
- def __pos__
- def __radd__
- def __rdiv__
- def __rfloordiv__
- def __rmul__
- def __rsub__
- def __sub__
- def convert_to_seconds
- def fromtimedelta
- def parse

Static Public Attributes

- tuple regexp

  Hideously ugly regular expression to parse the complex text form.

- int years_to_seconds = 31556926

  Conversion factor from years to seconds (value furnished by the "units" program).

13.218.1 Detailed Description

```
Timedelta with text parsing.  This accepts two input formats:

- A simple integer, indicating a number of seconds.

- A string of the form "uY vW wD xH yM zS" where u, v, w, x, y, and z
  are integers and Y, W, D, H, M, and S indicate years, weeks, days,
  hours, minutes, and seconds.  All of the fields are optional, but
  at least one must be specified.  Eg,"3D4H" means "three days plus
  four hours".

There is no "months" format, because the definition of a month is too
fuzzy to be useful (what day is six months from August 30th?)

Similarly, the "years" conversion may produce surprising results, as
"one year" in conventional English does not refer to a fixed interval
but rather a fixed (and in some cases undefined) offset within the
```

```
Gregorian calendar (what day is one year from February 29th?)  1Y as
implemented by this code refers to a specific number of seconds.
If you mean 365 days or 52 weeks, say that instead.
```

Definition at line 197 of file sundial.py.

13.218.2 Member Function Documentation

13.218.2.1 def rpki.sundial.timedelta.__abs__ (*self*)

Definition at line 276 of file sundial.py.

13.218.2.2 def rpki.sundial.timedelta.__add__ (*self, x*)

Definition at line 277 of file sundial.py.

13.218.2.3 def rpki.sundial.timedelta.__div__ (*self, x*)

Definition at line 278 of file sundial.py.

13.218.2.4 def rpki.sundial.timedelta.__floordiv__ (*self, x*)

Definition at line 279 of file sundial.py.

13.218.2.5 def rpki.sundial.timedelta.__mul__ (*self, x*)

Definition at line 280 of file sundial.py.

13.218.2.6 def rpki.sundial.timedelta.__neg__ (*self*)

Definition at line 281 of file sundial.py.

13.218.2.7 def rpki.sundial.timedelta.__pos__ (*self*)

Definition at line 282 of file sundial.py.

13.218.2.8 def rpki.sundial.timedelta.__radd__ (*self, x*)

Definition at line 283 of file sundial.py.

13.218.2.9 def rpki.sundial.timedelta.__rdiv__ (*self, x*)

Definition at line 284 of file sundial.py.

13.218.2.10 def rpki.sundial.timedelta.__rfloordiv__ (*self, x*)

Definition at line 285 of file sundial.py.

13.218.2.11 def rpki.sundial.timedelta.__rmul__ (*self, x*)

Definition at line 286 of file sundial.py.

13.218.2.12 def rpki.sundial.timedelta.__rsub__ (*self, x*)

Definition at line 287 of file sundial.py.

13.218.2.13 def rpki.sundial.timedelta.__sub__ (*self, x*)

Definition at line 288 of file sundial.py.

13.218.2.14 def rpki.sundial.timedelta.convert_to_seconds (*self*)

```
Convert a timedelta interval to seconds.
```

Definition at line 263 of file sundial.py.

13.218.2.15 def rpki.sundial.timedelta.fromtimedelta (*cls, x*)

```
Convert a datetime.timedelta object into this subclass.
```

Definition at line 270 of file sundial.py.

13.218.2.16 def rpki.sundial.timedelta.parse (*cls, arg*)

```
Parse text into a timedelta object.
```

Definition at line 242 of file sundial.py.

13.218.3 Member Data Documentation

13.218.3.1 rpki::sundial.timedelta::regexp [static]

Initial value:

```
re.compile("\\s*".join(("^",
                                    "(?:(?P<years>\\d+)Y)?",
                                    "(?:(?P<weeks>\\d+)W)?",
                                    "(?:(?P<days>\\d+)D)?",
                                    "(?:(?P<hours>\\d+)H)?",
                                    "(?:(?P<minutes>\\d+)M)?",
                                    "(?:(?P<seconds>\\d+)S)?",
                                    "$")),
                        re.I)
```

Hideously ugly regular expression to parse the complex text form.

Tags are intended for use with re.MatchObject.groupdict() and map directly to the keywords expected by the timedelta constructor.

Definition at line 225 of file sundial.py.

13.218.3.2 rpki::sundial.timedelta::years_to_seconds = 31556926 [static]

Conversion factor from years to seconds (value furnished by the "units" program).

Definition at line 239 of file sundial.py.

The documentation for this class was generated from the following file:

- sundial.py (3783)

13.219 rpki.up_down.base_elt Class Reference

Inheritance diagram for rpki.up_down.base_elt:

Collaboration diagram for rpki.up_down.base_elt:

Public Member Functions

- def check_response
- def endElement
- def make_b64elt
- def make_elt
- def serve_pdu
- def startElement

13.219.1 Detailed Description

```
Generic PDU object.

Virtual class, just provides some default methods.
```

Definition at line 43 of file up_down.py.

13.219.2 Member Function Documentation

13.219.2.1 def rpki.up_down.base_elt.check_response (*self*)

```
Placeholder for response checking.
```

Reimplemented in rpki.up_down.issue_response_pdu, and rpki.up_down.error_response_-pdu.

Definition at line 91 of file up_down.py.

13.219.2.2 def rpki.up_down.base_elt.endElement (*self, stack, name, text*)

```
Ignore endElement() if there's no specific handler.

If we don't need to do anything else, just pop the stack.
```

Reimplemented in rpki.up_down.certificate_elt, rpki.up_down.class_elt, rpki.up_down.issue_-pdu, and rpki.up_down.error_response_pdu.

Definition at line 59 of file up_down.py.

13.219.2.3 def rpki.up_down.base_elt.make_b64elt (*self, elt, name, value*)

```
Construct a sub-element with Base64 text content.
```

Definition at line 78 of file up_down.py.

13.219.2.4 def rpki.up_down.base_elt.make_elt (*self, name, attrs*)

```
Construct a element, copying over a set of attributes.
```

Definition at line 67 of file up_down.py.

13.219.2.5 def rpki.up_down.base_elt.serve_pdu (*self, q_msg, r_msg, child, callback, errback*)

```
Default PDU handler to catch unexpected types.
```

Reimplemented in rpki.rootd.list_pdu, rpki.rootd.issue_pdu, rpki.rootd.revoke_pdu, rpki.up_down.list_pdu, rpki.up_down.issue_pdu, and rpki.up_down.revoke_pdu.

Definition at line 85 of file up_down.py.

13.219.2.6 def rpki.up_down.base_elt.startElement (*self, stack, name, attrs*)

```
Ignore startElement() if there's no specific handler.

Some elements have no attributes and we only care about their
text content.
```

Reimplemented in rpki.up_down.certificate_elt, rpki.up_down.class_elt, rpki.up_down.class_response_syntax, rpki.up_down.issue_pdu, rpki.up_down.revoke_syntax, and rpki.up_down.message_pdu.

Definition at line 50 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.220 rpki.up_down.certificate_elt Class Reference

Inheritance diagram for rpki.up_down.certificate_elt:

Collaboration diagram for rpki.up_down.certificate_elt:

Public Member Functions

- def endElement
- def startElement
- def toXML

Public Attributes

- cert
- cert_url
- req_resource_set_as
- req_resource_set_ipv4
- req_resource_set_ipv6

13.220.1 Detailed Description

```
Up-Down protocol representation of an issued certificate.
```

Definition at line 132 of file up_down.py.

13.220.2 Member Function Documentation

13.220.2.1 def rpki.up_down.certificate_elt.endElement (*self, stack, name, text*)

```
Handle text content of a <certificate/> element.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 147 of file up_down.py.

13.220.2.2 def rpki.up_down.certificate_elt.startElement (*self, stack, name, attrs*)

```
Handle attributes of <certificate/> element.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 137 of file up_down.py.

13.220.2.3 def rpki.up_down.certificate_elt.toXML (*self*)

```
Generate a <certificate/> element.
```

Definition at line 155 of file up_down.py.

13.220.3 Member Data Documentation

13.220.3.1 rpki.up_down.certificate_elt.cert

Definition at line 149 of file up_down.py.

13.220.3.2 rpki.up_down.certificate_elt.cert_url

Definition at line 139 of file up_down.py.

13.220.3.3 rpki.up_down.certificate_elt.req_resource_set_as

Definition at line 139 of file up_down.py.

13.220.3.4 rpki.up_down.certificate_elt.req_resource_set_ipv4

Definition at line 139 of file up_down.py.

13.220.3.5 rpki.up_down.certificate_elt.req_resource_set_ipv6

Definition at line 139 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.221 rpki.up_down.class_elt Class Reference

Inheritance diagram for rpki.up_down.class_elt:

Collaboration diagram for rpki.up_down.class_elt:

Public Member Functions

- def __init__
- def endElement
- def from_resource_bag
- def startElement
- def to_resource_bag
- def toXML

Public Attributes

- cert_url
- certs
- class_name
- resource_set_as
- resource_set_ipv4
- resource_set_ipv6
- resource_set_notafter
- suggested_sia_head

Static Public Attributes

- issuer = None

13.221.1 Detailed Description

```
Up-Down protocol representation of a resource class.
```

Definition at line 164 of file up_down.py.

13.221.2 Constructor & Destructor Documentation

13.221.2.1 def rpki.up_down.class_elt.__init__ (*self*)

```
Initialize class_elt.
```

Definition at line 171 of file up_down.py.

13.221.3 Member Function Documentation

13.221.3.1 def rpki.up_down.class_elt.endElement (*self, stack, name, text*)

```
Handle <class/> elements and their children.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 197 of file up_down.py.

13.221.3.2 def rpki.up_down.class_elt.from_resource_bag (*self, bag*)

```
Set resources of this class element from a resource_bag.
```

Definition at line 227 of file up_down.py.

13.221.3.3 def rpki.up_down.class_elt.startElement (*self, stack, name, attrs*)

```
Handle <class/> elements and their children.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 178 of file up_down.py.

13.221.3.4 def rpki.up_down.class_elt.to_resource_bag (*self*)

```
Build a resource_bag from from this <class/> element.
```

Definition at line 218 of file up_down.py.

13.221.3.5 def rpki.up_down.class_elt.toXML (*self*)

```
Generate a <class/> element.
```

Definition at line 207 of file up_down.py.

13.221.4 Member Data Documentation

13.221.4.1 rpki.up_down.class_elt.cert_url

Definition at line 180 of file up_down.py.

13.221.4.2 rpki.up_down.class_elt.certs

Definition at line 173 of file up_down.py.

13.221.4.3 rpki.up_down.class_elt.class_name

Definition at line 180 of file up_down.py.

13.221.4.4 rpki.up_down.class_elt.issuer = None `[static]`

Definition at line 169 of file up_down.py.

13.221.4.5 rpki.up_down.class_elt.resource_set_as

Definition at line 180 of file up_down.py.

13.221.4.6 rpki.up_down.class_elt.resource_set_ipv4

Definition at line 180 of file up_down.py.

13.221.4.7 rpki.up_down.class_elt.resource_set_ipv6

Definition at line 180 of file up_down.py.

13.221.4.8 rpki.up_down.class_elt.resource_set_notafter

Definition at line 180 of file up_down.py.

13.221.4.9 rpki.up_down.class_elt.suggested_sia_head

Definition at line 180 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.222 rpki.up_down.class_response_syntax Class Reference

Inheritance diagram for rpki.up_down.class_response_syntax:

Collaboration diagram for rpki.up_down.class_response_syntax:

Public Member Functions

- def __init__

- def startElement
- def toXML

Public Attributes

- classes

13.222.1 Detailed Description

```
Syntax for Up-Down protocol "list_response" and "issue_response" PDUs.
```

Definition at line 292 of file up_down.py.

13.222.2 Constructor & Destructor Documentation

13.222.2.1 def rpki.up_down.class_response_syntax.__init__ (*self*)

```
Initialize class_response_syntax.
```

Definition at line 297 of file up_down.py.

13.222.3 Member Function Documentation

13.222.3.1 def rpki.up_down.class_response_syntax.startElement (*self, stack, name, attrs*)

```
Handle "list_response" and "issue_response" PDUs.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 304 of file up_down.py.

13.222.3.2 def rpki.up_down.class_response_syntax.toXML (*self*)

```
Generate payload of "list_response" and "issue_response" PDUs.
```

Definition at line 314 of file up_down.py.

13.222.4 Member Data Documentation

13.222.4.1 rpki.up_down.class_response_syntax.classes

Definition at line 299 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.223 rpki.up_down.cms_msg Class Reference

Inheritance diagram for rpki.up_down.cms_msg:

Collaboration diagram for rpki.up_down.cms_msg:

Static Public Attributes

- string encoding = "UTF-8"
- saxify = sax_handler.saxify
- schema = rpki.relaxng.up_down

13.223.1 Detailed Description

```
Class to hold a CMS-signed up-down PDU.
```

Definition at line 699 of file up_down.py.

13.223.2 Member Data Documentation

13.223.2.1 string rpki.up_down.cms_msg.encoding = "UTF-8" [static]

Definition at line 704 of file up_down.py.

13.223.2.2 rpki.up_down.cms_msg.saxify = sax_handler.saxify [static]

Reimplemented in rpki.rootd.cms_msg.

Definition at line 706 of file up_down.py.

13.223.2.3 rpki.up_down.cms_msg.schema = rpki.relaxng.up_down [static]

Definition at line 705 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.224 rpki.up_down.error_response_pdu Class Reference

Inheritance diagram for rpki.up_down.error_response_pdu:

Collaboration diagram for rpki.up_down.error_response_pdu:

Public Member Functions

- def __init__
- def check_response
- def endElement
- def toXML

Public Attributes

- description
- status

Static Public Attributes

- dictionary codes
- dictionary exceptions

13.224.1 Detailed Description

```
Up-Down protocol "error_response" PDU.
```

Definition at line 517 of file up_down.py.

13.224.2 Constructor & Destructor Documentation

13.224.2.1 def rpki.up_down.error_response_pdu.__init__ (*self, exception* = *None*)

```
Initialize an error_response PDU from an exception object.
```

Definition at line 536 of file up_down.py.

13.224.3 Member Function Documentation

13.224.3.1 def rpki.up_down.error_response_pdu.check_response (*self*)

```
Handle an error response.  For now, just raise an exception,
perhaps figure out something more clever to do later.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 576 of file up_down.py.

13.224.3.2 def rpki.up_down.error_response_pdu.endElement (*self, stack, name, text*)

```
Handle "error_response" PDU.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 545 of file up_down.py.

13.224.3.3 def rpki.up_down.error_response_pdu.toXML (*self*)

```
Generate payload of "error_response" PDU.
```

Definition at line 561 of file up_down.py.

13.224.4 Member Data Documentation

13.224.4.1 dictionary rpki.up_down.error_response_pdu.codes [static]

Initial value:

```
{
    1101 : "Already processing request",
    1102 : "Version number error",
    1103 : "Unrecognised request type",
    1201 : "Request - no such resource class",
    1202 : "Request - no resources allocated in resource class",
    1203 : "Request - badly formed certificate request",
    1301 : "Revoke - no such resource class",
    1302 : "Revoke - no such key",
    2001 : "Internal Server Error - Request not performed" }
```

Definition at line 522 of file up_down.py.

13.224.4.2 rpki.up_down.error_response_pdu.description

Definition at line 538 of file up_down.py.

13.224.4.3 dictionary rpki.up_down.error_response_pdu.exceptions [static]

Initial value:

```
{
    rpki.exceptions.NoActiveCA : 1202 }
```

Definition at line 533 of file up_down.py.

13.224.4.4 rpki.up_down.error_response_pdu.status

Definition at line 538 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.225 rpki.up_down.issue_pdu Class Reference

Inheritance diagram for rpki.up_down.issue_pdu:

Collaboration diagram for rpki.up_down.issue_pdu:

Public Member Functions

- def endElement
- def query
- def serve_pdu
- def startElement
- def toXML

Public Attributes

- class_name
- pkcs10
- req_resource_set_as
- req_resource_set_ipv4
- req_resource_set_ipv6

13.225.1 Detailed Description

```
Up-Down protocol "issue" PDU.
```

Definition at line 324 of file up_down.py.

13.225.2 Member Function Documentation

13.225.2.1 def rpki.up_down.issue_pdu.endElement (*self, stack, name, text*)

```
Handle "issue" PDU.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 339 of file up_down.py.

13.225.2.2 def rpki.up_down.issue_pdu.query (*cls, parent, ca, ca_detail, callback, errback*)

```
Send an "issue" request to parent associated with ca.
```

Definition at line 428 of file up_down.py.

13.225.2.3 def rpki.up_down.issue_pdu.serve_pdu (*self, q_msg, r_msg, child, callback, errback*)

```
Serve one issue request PDU.
```

Reimplemented from rpki.up_down.base_elt.

Reimplemented in rpki.rootd.issue_pdu.

Definition at line 356 of file up_down.py.

13.225.2.4 def rpki.up_down.issue_pdu.startElement (*self, stack, name, attrs*)

```
Handle "issue" PDU.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 329 of file up_down.py.

13.225.2.5 def rpki.up_down.issue_pdu.toXML (*self*)

```
Generate payload of "issue" PDU.
```

Definition at line 347 of file up_down.py.

13.225.3 Member Data Documentation

13.225.3.1 rpki.up_down.issue_pdu.class_name

Definition at line 331 of file up_down.py.

13.225.3.2 rpki.up_down.issue_pdu.pkcs10

Definition at line 341 of file up_down.py.

13.225.3.3 rpki.up_down.issue_pdu.req_resource_set_as

Definition at line 331 of file up_down.py.

13.225.3.4 rpki.up_down.issue_pdu.req_resource_set_ipv4

Definition at line 331 of file up_down.py.

13.225.3.5 rpki.up_down.issue_pdu.req_resource_set_ipv6

Definition at line 331 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.226 rpki.up_down.issue_response_pdu Class Reference

Inheritance diagram for rpki.up_down.issue_response_pdu:

Collaboration diagram for rpki.up_down.issue_response_pdu:

Public Member Functions

- def check_response

13.226.1 Detailed Description

```
Up-Down protocol "issue_response" PDU.
```

Definition at line 441 of file up_down.py.

13.226.2 Member Function Documentation

13.226.2.1 def rpki.up_down.issue_response_pdu.check_response (*self*)

```
Check whether this looks like a reasonable issue_response PDU.
XML schema should be tighter for this response.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 446 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.227 rpki.up_down.list_pdu Class Reference

Inheritance diagram for rpki.up_down.list_pdu:

Collaboration diagram for rpki.up_down.list_pdu:

Public Member Functions

- def query

- def serve_pdu
- def toXML

13.227.1 Detailed Description

```
Up-Down protocol "list" PDU.
```

Definition at line 236 of file up_down.py.

13.227.2 Member Function Documentation

13.227.2.1 def rpki.up_down.list_pdu.query (*cls, parent, cb, eb*)

```
Send a "list" query to parent.
```

Definition at line 280 of file up_down.py.

13.227.2.2 def rpki.up_down.list_pdu.serve_pdu (*self, q_msg, r_msg, child, callback, errback*)

```
Serve one "list" PDU.
```

Reimplemented from rpki.up_down.base_elt.

Reimplemented in rpki.rootd.list_pdu.

Definition at line 245 of file up_down.py.

13.227.2.3 def rpki.up_down.list_pdu.toXML (*self*)

```
Generate (empty) payload of "list" PDU.
```

Definition at line 241 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.228 rpki.up_down.list_response_pdu Class Reference

Inheritance diagram for rpki.up_down.list_response_pdu:

Collaboration diagram for rpki.up_down.list_response_pdu:

13.228.1 Detailed Description

```
Up-Down protocol "list_response" PDU.
```

Definition at line 318 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.229 rpki.up_down.message_pdu Class Reference

Inheritance diagram for rpki.up_down.message_pdu:

Collaboration diagram for rpki.up_down.message_pdu:

Public Member Functions

- def __str__
- def log_query
- def make_query
- def serve_error
- def serve_top_level
- def startElement
- def toXML

Public Attributes

- payload
- recipient
- sender
- type
- version

Static Public Attributes

- dictionary name2type
- tuple type2name = dict((v, k) for k, v in name2type.items())
- int version = 1

13.229.1 Detailed Description

```
Up-Down protocol message wrapper PDU.
```

Definition at line 583 of file up_down.py.

13.229.2 Member Function Documentation

13.229.2.1 def rpki.up_down.message_pdu.__str__ (*self*)

```
Convert a message PDU to a string.
```

Definition at line 625 of file up_down.py.

13.229.2.2 def rpki.up_down.message_pdu.log_query (*self, child*)

```
Log query we're handling.  Separate method so rootd can override.
```

Reimplemented in rpki.rootd.message_pdu.

Definition at line 656 of file up_down.py.

13.229.2.3 def rpki.up_down.message_pdu.make_query (*cls, payload, sender, recipient*)

```
Construct one message PDU.
```

Definition at line 674 of file up_down.py.

13.229.2.4 def rpki.up_down.message_pdu.serve_error (*self, exception*)

```
Generate an error_response message PDU.
```

Definition at line 662 of file up_down.py.

13.229.2.5 def rpki.up_down.message_pdu.serve_top_level (*self, child, callback*)

```
Serve one message request PDU.
```

Definition at line 631 of file up_down.py.

13.229.2.6 def rpki.up_down.message_pdu.startElement (*self, stack, name, attrs*)

```
Handle message PDU.

Payload of the <message/> element varies depending on the "type"
attribute, so after some basic checks we have to instantiate the
right class object to handle whatever kind of PDU this is.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 609 of file up_down.py.

13.229.2.7 def rpki.up_down.message_pdu.toXML (*self*)

```
Generate payload of message PDU.
```

Definition at line 601 of file up_down.py.

13.229.3 Member Data Documentation

13.229.3.1 dictionary rpki.up_down.message_pdu.name2type [static]

Initial value:

```
{
    "list"            : list_pdu,
    "list_response"   : list_response_pdu,
    "issue"           : issue_pdu,
    "issue_response"  : issue_response_pdu,
    "revoke"          : revoke_pdu,
    "revoke_response" : revoke_response_pdu,
    "error_response"  : error_response_pdu }
```

Reimplemented in rpki.rootd.message_pdu.

Definition at line 590 of file up_down.py.

13.229.3.2 rpki.up_down.message_pdu.payload

Definition at line 615 of file up_down.py.

13.229.3.3 rpki.up_down.message_pdu.recipient

Definition at line 615 of file up_down.py.

13.229.3.4 rpki.up_down.message_pdu.sender

Definition at line 615 of file up_down.py.

13.229.3.5 rpki.up_down.message_pdu.type

Definition at line 615 of file up_down.py.

13.229.3.6 tuple rpki.up_down.message_pdu.type2name = dict((v, k) for k, v in name2type.items()) [static]

Reimplemented in rpki.rootd.message_pdu.

Definition at line 599 of file up_down.py.

13.229.3.7 int rpki.up_down.message_pdu.version = 1 [static]

Definition at line 588 of file up_down.py.

13.229.3.8 rpki.up_down.message_pdu.version

Definition at line 615 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.230 rpki.up_down.multi_uri Class Reference

Inheritance diagram for rpki.up_down.multi_uri:

Collaboration diagram for rpki.up_down.multi_uri:

Public Member Functions

- def __init__
- def __str__
- def rsync

13.230.1 Detailed Description

```
Container for a set of URIs.
```

Definition at line 97 of file up_down.py.

13.230.2 Constructor & Destructor Documentation

13.230.2.1 def rpki.up_down.multi_uri.__init__ (*self, ini*)

```
Initialize a set of URIs, which includes basic some syntax checking.
```

Definition at line 102 of file up_down.py.

13.230.3 Member Function Documentation

13.230.3.1 def rpki.up_down.multi_uri.__str__ (*self*)

```
Convert a multi_uri back to a string representation.
```

Definition at line 117 of file up_down.py.

13.230.3.2 def rpki.up_down.multi_uri.rsync (*self*)

```
Find first rsync://... URI in self.
```

Definition at line 123 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.231 rpki.up_down.revoke_pdu Class Reference

Inheritance diagram for rpki.up_down.revoke_pdu:

Collaboration diagram for rpki.up_down.revoke_pdu:

Public Member Functions

- def get_SKI
- def query
- def serve_pdu

Public Attributes

- class_name
- ski

13.231.1 Detailed Description

```
Up-Down protocol "revoke" PDU.
```

Definition at line 468 of file up_down.py.

13.231.2 Member Function Documentation

13.231.2.1 def rpki.up_down.revoke_pdu.get_SKI (*self*)

```
Convert g(SKI) encoding from PDU back to raw SKI.
```

Definition at line 473 of file up_down.py.

13.231.2.2 def rpki.up_down.revoke_pdu.query (*cls, ca, gski, cb, eb*)

```
Send a "revoke" request for certificate(s) named by gski to parent associated with ca.
```

Definition at line 499 of file up_down.py.

13.231.2.3 def rpki.up_down.revoke_pdu.serve_pdu (*self, q_msg, r_msg, child, cb, eb*)

```
Serve one revoke request PDU.
```

Reimplemented from rpki.up_down.base_elt.

Reimplemented in rpki.rootd.revoke_pdu.

Definition at line 479 of file up_down.py.

13.231.3 Member Data Documentation

13.231.3.1 rpki.up_down.revoke_pdu.class_name

Reimplemented from rpki.up_down.revoke_syntax.

Definition at line 501 of file up_down.py.

13.231.3.2 rpki.up_down.revoke_pdu.ski

Reimplemented from rpki.up_down.revoke_syntax.

Definition at line 501 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.232 rpki.up_down.revoke_response_pdu Class Reference

Inheritance diagram for rpki.up_down.revoke_response_pdu:

Collaboration diagram for rpki.up_down.revoke_response_pdu:

13.232.1 Detailed Description

```
Up-Down protocol "revoke_response" PDU.
```

Definition at line 510 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.233 rpki.up_down.revoke_syntax Class Reference

Inheritance diagram for rpki.up_down.revoke_syntax:

Collaboration diagram for rpki.up_down.revoke_syntax:

Public Member Functions

- def startElement

- def toXML

Public Attributes

- class_name
- ski

13.233.1 Detailed Description

```
Syntax for Up-Down protocol "revoke" and "revoke_response" PDUs.
```

Definition at line 454 of file up_down.py.

13.233.2 Member Function Documentation

13.233.2.1 def rpki.up_down.revoke_syntax.startElement (*self, stack, name, attrs*)

```
Handle "revoke" PDU.
```

Reimplemented from rpki.up_down.base_elt.

Definition at line 459 of file up_down.py.

13.233.2.2 def rpki.up_down.revoke_syntax.toXML (*self*)

```
Generate payload of "revoke" PDU.
```

Definition at line 464 of file up_down.py.

13.233.3 Member Data Documentation

13.233.3.1 rpki.up_down.revoke_syntax.class_name

Reimplemented in rpki.up_down.revoke_pdu.

Definition at line 459 of file up_down.py.

13.233.3.2 rpki.up_down.revoke_syntax.ski

Reimplemented in rpki.up_down.revoke_pdu.

Definition at line 459 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.234 rpki.up_down.sax_handler Class Reference

Inheritance diagram for rpki.up_down.sax_handler:

Collaboration diagram for rpki.up_down.sax_handler:

Static Public Attributes

- string name = "message"
- pdu = message_pdu
- string version = "1"

13.234.1 Detailed Description

```
SAX handler for Up-Down protocol.
```

Definition at line 690 of file up_down.py.

13.234.2 Member Data Documentation

13.234.2.1 string rpki.up_down.sax_handler.name = "message" [static]

Definition at line 696 of file up_down.py.

13.234.2.2 rpki.up_down.sax_handler.pdu = message_pdu [static]

Reimplemented in rpki.rootd.sax_handler.

Definition at line 695 of file up_down.py.

13.234.2.3 string rpki.up_down.sax_handler.version = "1" [static]

Definition at line 697 of file up_down.py.

The documentation for this class was generated from the following file:

- up_down.py (3746)

13.235 rpki.x509.CMS_object Class Reference

Inheritance diagram for rpki.x509.CMS_object:

Collaboration diagram for rpki.x509.CMS_object:

Public Member Functions

- def extract
- def get_content
- def get_DER
- def get_POW
- def get_signingTime
- def set_content
- def sign
- def verify

Public Attributes

- content
- DER

  DER value of this object.

- POW

Static Public Attributes

- debug_cms_certs = False

  Set this to True to log a lot of chatter about CMS certificates.

- dump_on_verify_failure = True

  Set this to True to get dumpasn1 dumps of ASN.1 on CMS verify failures.

- tuple econtent_oid = POWify_OID("id-data")
- tuple formats = ("DER", "POW")

  Formats supported in this object.

- tuple other_clear = ("content",)

  Other attributes that self.clear() should whack.

- tuple pem_converter = PEM_converter("CMS")

  PEM converter for this object.

- print_on_der_error = True

  Set this to True to log alleged DER when we have trouble parsing it, in case it's really a Perl backtrace or something.

- require_crls = False

Set this to False to make CMS CRLs optional in the cases where we would otherwise require them.

13.235.1 Detailed Description

```
Class to hold a CMS-wrapped object.

CMS-wrapped objects are a little different from the other DER_object
types because the signed object is CMS wrapping inner content that's
also ASN.1, and due to our current minimal support for CMS we can't
just handle this as a pretty composite object.  So, for now anyway,
a CMS_object is the outer CMS wrapped object so that the usual DER
and PEM operations do the obvious things, and the inner content is
handle via separate methods.
```

Definition at line 811 of file x509.py.

13.235.2 Member Function Documentation

13.235.2.1 def rpki.x509.CMS_object.extract (*self*)

```
Extract and store inner content from CMS wrapper without verifying
the CMS.

DANGER WILL ROBINSON!!!

Do not use this method on unvalidated data.  Use the verify()
method instead.

If you don't understand this warning, don't use this method.
```

Definition at line 968 of file x509.py.

13.235.2.2 def rpki.x509.CMS_object.get_content (*self*)

```
Get the inner content of this CMS_object.
```

Definition at line 873 of file x509.py.

13.235.2.3 def rpki.x509.CMS_object.get_DER (*self*)

```
Get the DER value of this CMS_object.
```

Reimplemented from rpki.x509.DER_object.

Definition at line 852 of file x509.py.

13.235.2.4 def rpki.x509.CMS_object.get_POW (*self*)

```
Get the rpki.POW value of this CMS_object.
```

Definition at line 864 of file x509.py.

13.235.2.5 def rpki.x509.CMS_object.get_signingTime (*self*)

```
Extract signingTime from CMS signed attributes.
```

Definition at line 888 of file x509.py.

13.235.2.6 def rpki.x509.CMS_object.set_content (*self, content*)

```
Set the (inner) content of this CMS_object, clearing the wrapper.
```

Definition at line 881 of file x509.py.

13.235.2.7 def rpki.x509.CMS_object.sign (*self, keypair, certs, crls* = **None**, *no_certs* = **False**)

```
Sign and wrap inner content.
```

Definition at line 996 of file x509.py.

13.235.2.8 def rpki.x509.CMS_object.verify (*self, ta*)

```
Verify CMS wrapper and store inner content.
```

Definition at line 894 of file x509.py.

13.235.3 Member Data Documentation

13.235.3.1 rpki.x509.CMS_object.content

Reimplemented in rpki.x509.DER_CMS_object, rpki.x509.XML_CMS_object, and rpki.x509.Ghostbuster.

Definition at line 883 of file x509.py.

13.235.3.2 rpki::x509.CMS_object::debug_cms_certs = False [static]

Set this to True to log a lot of chatter about CMS certificates.

Definition at line 837 of file x509.py.

13.235.3.3 rpki.x509.CMS_object.DER

DER value of this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 854 of file x509.py.

13.235.3.4 rpki::x509.CMS_object::dump_on_verify_failure = True [static]

Set this to True to get dumpasn1 dumps of ASN.1 on CMS verify failures.

Definition at line 832 of file x509.py.

13.235.3.5 tuple rpki.x509.CMS_object.econtent_oid = POWify_OID("id-data") [static]

Reimplemented in rpki.x509.SignedManifest, rpki.x509.ROA, rpki.x509.XML_CMS_-object, and rpki.x509.Ghostbuster.

Definition at line 826 of file x509.py.

13.235.3.6 tuple rpki.x509.CMS_object.formats = ("DER", "POW") [static]

Formats supported in this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 824 of file x509.py.

13.235.3.7 tuple rpki.x509.CMS_object.other_clear = ("content",) [static]

Other attributes that self.clear() should whack.

Reimplemented from rpki.x509.DER_object.

Definition at line 825 of file x509.py.

13.235.3.8 tuple rpki.x509.CMS_object.pem_converter = PEM_converter("CMS") [static]

PEM converter for this object.

Reimplemented from rpki.x509.DER_object.

Reimplemented in rpki.x509.SignedManifest, rpki.x509.ROA, and rpki.x509.Ghostbuster.

Definition at line 827 of file x509.py.

13.235.3.9 rpki.x509.CMS_object.POW

Definition at line 866 of file x509.py.

13.235.3.10 rpki::x509.CMS_object::print_on_der_error = True [static]

Set this to True to log alleged DER when we have trouble parsing it, in case it's really a Perl backtrace or something.

Definition at line 850 of file x509.py.

13.235.3.11 rpki::x509.CMS_object::require_crls = False [static]

Set this to False to make CMS CRLs optional in the cases where we would otherwise require them.

Some day this option should go away and CRLs should be uncondtionally mandatory in such cases.

Definition at line 844 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.236 rpki.x509.CRL Class Reference

Inheritance diagram for rpki.x509.CRL:

Collaboration diagram for rpki.x509.CRL:

Public Member Functions

- def generate
- def get_DER
- def get_POW
- def get_POWpkix
- def getIssuer
- def getNextUpdate
- def getThisUpdate

Public Attributes

- DER

  DER value of this object.

- POW
- POWpkix

Static Public Attributes

- tuple formats = ("DER", "POW", "POWpkix")

  Formats supported in this object.

- tuple pem_converter = PEM_converter("X509 CRL")

  PEM converter for this object.

13.236.1 Detailed Description

```
Class to hold a Certificate Revocation List.
```

Definition at line 1275 of file x509.py.

13.236.2 Member Function Documentation

13.236.2.1 def rpki.x509.CRL.generate (*cls, keypair, issuer, serial, thisUpdate, nextUpdate, revokedCertificates, version = 1, digestType = "sha256WithRSAEncryption"*)

```
Generate a new CRL.
```

Definition at line 1337 of file x509.py.

13.236.2.2 def rpki.x509.CRL.get_DER (*self*)

```
Get the DER value of this CRL.
```

Reimplemented from rpki.x509.DER_object.

Definition at line 1283 of file x509.py.

13.236.2.3 def rpki.x509.CRL.get_POW (*self*)

```
Get the rpki.POW value of this CRL.
```

Definition at line 1298 of file x509.py.

13.236.2.4 def rpki.x509.CRL.get_POWpkix (*self*)

```
Get the rpki.POW.pkix value of this CRL.
```

Definition at line 1307 of file x509.py.

13.236.2.5 def rpki.x509.CRL.getIssuer (*self*)

```
Get issuer value of this CRL.
```

Definition at line 1330 of file x509.py.

13.236.2.6 def rpki.x509.CRL.getNextUpdate (*self*)

```
Get nextUpdate value from this CRL.
```

Definition at line 1324 of file x509.py.

13.236.2.7 def rpki.x509.CRL.getThisUpdate (*self*)

```
Get thisUpdate value from this CRL.
```

Definition at line 1318 of file x509.py.

13.236.3 Member Data Documentation

13.236.3.1 rpki.x509.CRL.DER

DER value of this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 1285 of file x509.py.

13.236.3.2 tuple rpki.x509.CRL.formats = ("DER", "POW", "POWpkix") [static]

Formats supported in this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 1280 of file x509.py.

13.236.3.3 tuple rpki.x509.CRL.pem_converter = PEM_converter("X509 CRL") [static]

PEM converter for this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 1281 of file x509.py.

13.236.3.4 rpki.x509.CRL.POW

Definition at line 1300 of file x509.py.

13.236.3.5 rpki.x509.CRL.POWpkix

Definition at line 1309 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.237 rpki.x509.DeadDrop Class Reference

Inheritance diagram for rpki.x509.DeadDrop:

Collaboration diagram for rpki.x509.DeadDrop:

Public Member Functions

- def __init__
- def dump

Public Attributes

- maildir
- pid

13.237.1 Detailed Description

```
Dead-drop utility for storing copies of CMS messages for debugging or
audit.  At the moment this uses Maildir mailbox format, as it has
approximately the right properties and a number of useful tools for
manipulating it already exist.
```

Definition at line 1138 of file x509.py.

13.237.2 Constructor & Destructor Documentation

13.237.2.1 def rpki.x509.DeadDrop.__init__ (*self, name*)

Definition at line 1146 of file x509.py.

13.237.3 Member Function Documentation

13.237.3.1 def rpki.x509.DeadDrop.dump (*self, obj*)

Definition at line 1150 of file x509.py.

13.237.4 Member Data Documentation

13.237.4.1 rpki.x509.DeadDrop.maildir

Definition at line 1146 of file x509.py.

13.237.4.2 rpki.x509.DeadDrop.pid

Definition at line 1146 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.238 rpki.x509.DER_CMS_object Class Reference

Inheritance diagram for rpki.x509.DER_CMS_object:

Collaboration diagram for rpki.x509.DER_CMS_object:

Public Member Functions

- def decode
- def encode

Public Attributes

- content

13.238.1 Detailed Description

```
Class to hold CMS objects with DER-based content.
```

Definition at line 1032 of file x509.py.

13.238.2 Member Function Documentation

13.238.2.1 def rpki.x509.DER_CMS_object.decode (*self, der*)

```
Decode DER and set inner content.
```

Reimplemented in rpki.x509.Ghostbuster.

Definition at line 1043 of file x509.py.

13.238.2.2 def rpki.x509.DER_CMS_object.encode (*self*)

```
Encode inner content for signing.
```

Reimplemented in rpki.x509.Ghostbuster.

Definition at line 1037 of file x509.py.

13.238.3 Member Data Documentation

13.238.3.1 rpki.x509.DER_CMS_object.content

Reimplemented from rpki.x509.CMS_object.

Reimplemented in rpki.x509.Ghostbuster.

Definition at line 1045 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.239 rpki.x509.DER_object Class Reference

Inheritance diagram for rpki.x509.DER_object:

Collaboration diagram for rpki.x509.DER_object:

Public Member Functions

- def __cmp__
- def __init__
- def check
- def check_auto_update
- def clear
- def dumpasn1
- def empty
- def from_sql
- def gAKI
- def get_3779resources
- def get_AIA
- def get_aia_uri
- def get_AKI
- def get_Base64
- def get_basicConstraints
- def get_DER
- def get_PEM
- def get_SIA
- def get_sia_directory_uri
- def get_sia_manifest_uri
- def get_SKI
- def gSKI
- def hAKI
- def hSKI
- def is_CA
- def set
- def to_sql

Public Attributes

- DER

  DER value of this object.

- filename
- timestamp

Static Public Attributes

- tuple formats = ("DER",)
  Formats supported in this object.
- tuple other_clear = ()
  Other attributes that self.clear() should whack.
- pem_converter = None
  PEM converter for this object.

13.239.1 Detailed Description

```
Virtual class to hold a generic DER object.
```

Definition at line 123 of file x509.py.

13.239.2 Constructor & Destructor Documentation

13.239.2.1 def rpki.x509.DER_object.__init__ (*self, kw*)

```
Initialize a DER_object.
```

Definition at line 155 of file x509.py.

13.239.3 Member Function Documentation

13.239.3.1 def rpki.x509.DER_object.__cmp__ (*self, other*)

```
Compare two DER-encoded objects.
```

Definition at line 252 of file x509.py.

13.239.3.2 def rpki.x509.DER_object.check (*self*)

```
Perform basic checks on a DER object.
```

Definition at line 222 of file x509.py.

13.239.3.3 def rpki.x509.DER_object.check_auto_update (*self*)

```
Check for updates to a DER object that auto-updates from a file.
```

Definition at line 202 of file x509.py.

13.239.3.4 def rpki.x509.DER_object.clear (*self*)

```
Make this object empty.
```

Definition at line 146 of file x509.py.

13.239.3.5 def rpki.x509.DER_object.dumpasn1 (*self*)

```
Pretty print an ASN.1 DER object using cryptlib dumpasn1 tool.
Use a temporary file rather than popen4() because dumpasn1 uses
seek() when decoding ASN.1 content nested in OCTET STRING values.
```

Definition at line 385 of file x509.py.

13.239.3.6 def rpki.x509.DER_object.empty (*self*)

```
Test whether this object is empty.
```

Definition at line 140 of file x509.py.

13.239.3.7 def rpki.x509.DER_object.from_sql (*cls, x*)

```
Convert from SQL storage format.
```

Definition at line 373 of file x509.py.

13.239.3.8 def rpki.x509.DER_object.gAKI (*self*)

```
Calculate g(AKI) for this object.  Only work for subclasses
that implement get_AKI().
```

Definition at line 288 of file x509.py.

13.239.3.9 def rpki.x509.DER_object.get_3779resources (*self*)

```
Get RFC 3779 resources as rpki.resource_set objects.  Only works
for subclasses that support getExtensions().
```

Definition at line 360 of file x509.py.

13.239.3.10 def rpki.x509.DER_object.get_AIA (*self*)

```
Get the SIA extension from this object.  Only works for subclasses
that support getExtension().
```

Definition at line 331 of file x509.py.

13.239.3.11 def rpki.x509.DER_object.get_aia_uri (*self*)

```
Get AIA (id-ad-caIssuers) URI from this object.
Only works for subclasses that support getExtension().
```

Definition at line 338 of file x509.py.

13.239.3.12 def rpki.x509.DER_object.get_AKI (*self*)

```
Get the AKI extension from this object.  Only works for subclasses
that support getExtension().
```

Definition at line 295 of file x509.py.

13.239.3.13 def rpki.x509.DER_object.get_Base64 (*self*)

```
Get the Base64 encoding of the DER value of this object.
```

Definition at line 240 of file x509.py.

13.239.3.14 def rpki.x509.DER_object.get_basicConstraints (*self*)

```
Get the basicConstraints extension from this object.  Only works
for subclasses that support getExtension().
```

Definition at line 345 of file x509.py.

13.239.3.15 def rpki.x509.DER_object.get_DER (*self*)

```
Get the DER value of this object.

Subclasses will almost certainly override this method.
```

Reimplemented in rpki.x509.X509, rpki.x509.PKCS10, rpki.x509.RSA, rpki.x509.RSApublic, rpki.x509.CMS_object, and rpki.x509.CRL.

Definition at line 229 of file x509.py.

13.239.3.16 def rpki.x509.DER_object.get_PEM (*self*)

```
Get the PEM representation of this object.
```

Definition at line 246 of file x509.py.

13.239.3.17 def rpki.x509.DER_object.get_SIA (*self*)

```
Get the SIA extension from this object.  Only works for subclasses
that support getExtension().
```

Definition at line 310 of file x509.py.

13.239.3.18 def rpki.x509.DER_object.get_sia_directory_uri (*self*)

```
Get SIA directory (id-ad-caRepository) URI from this object.
Only works for subclasses that support getExtension().
```

Definition at line 317 of file x509.py.

13.239.3.19 def rpki.x509.DER_object.get_sia_manifest_uri (*self*)

```
Get SIA manifest (id-ad-rpkiManifest) URI from this object.
Only works for subclasses that support getExtension().
```

Definition at line 324 of file x509.py.

13.239.3.20 def rpki.x509.DER_object.get_SKI (*self*)

```
Get the SKI extension from this object.  Only works for subclasses
that support getExtension().
```

Reimplemented in rpki.x509.RSA, and rpki.x509.RSApublic.

Definition at line 303 of file x509.py.

13.239.3.21 def rpki.x509.DER_object.gSKI (*self*)

```
Calculate g(SKI) for this object.  Only work for subclasses
that implement get_SKI().
```

Definition at line 273 of file x509.py.

13.239.3.22 def rpki.x509.DER_object.hAKI (*self*)

```
Return hexadecimal string representation of AKI for this
object.  Only work for subclasses that implement get_AKI().
```

Definition at line 280 of file x509.py.

13.239.3.23 def rpki.x509.DER_object.hSKI (*self*)

```
Return hexadecimal string representation of SKI for this object.
Only work for subclasses that implement get_SKI().
```

Definition at line 265 of file x509.py.

13.239.3.24 def rpki.x509.DER_object.is_CA (*self*)

```
Return True if and only if object has the basicConstraints
extension and its cA value is true.
```

Definition at line 352 of file x509.py.

13.239.3.25 def rpki.x509.DER_object.set (*self, kw*)

```
Set this object by setting one of its known formats.

This method only allows one to set one format at a time.
Subsequent calls will clear the object first.  The point of all
this is to let the object's internal converters handle mustering
the object into whatever format you need at the moment.
```

Definition at line 163 of file x509.py.

13.239.3.26 def rpki.x509.DER_object.to_sql (*self*)

```
Convert to SQL storage format.
```

Definition at line 379 of file x509.py.

13.239.4 Member Data Documentation

13.239.4.1 rpki::x509.DER_object::DER

DER value of this object.

Reimplemented in rpki.x509.X509, rpki.x509.PKCS10, rpki.x509.RSA, rpki.x509.RSApublic, rpki.x509.CMS_object, and rpki.x509.CRL.

Definition at line 170 of file x509.py.

13.239.4.2 rpki.x509.DER_object.filename

Definition at line 148 of file x509.py.

13.239.4.3 tuple rpki.x509.DER_object.formats = ("DER",) [static]

Formats supported in this object.

Reimplemented in rpki.x509.X509, rpki.x509.PKCS10, rpki.x509.RSA, rpki.x509.RSApublic, rpki.x509.CMS_object, and rpki.x509.CRL.

Definition at line 129 of file x509.py.

13.239.4.4 tuple rpki.x509.DER_object.other_clear = () [static]

Other attributes that self.clear() should whack.

Reimplemented in rpki.x509.CMS_object.

Definition at line 135 of file x509.py.

13.239.4.5 rpki.x509.DER_object.pem_converter = None [static]

PEM converter for this object.

Reimplemented in rpki.x509.X509, rpki.x509.PKCS10, rpki.x509.RSA, rpki.x509.RSApublic, rpki.x509.CMS_object, rpki.x509.SignedManifest, rpki.x509.ROA, rpki.x509.Ghostbuster, and rpki.x509.CRL.

Definition at line 132 of file x509.py.

13.239.4.6 rpki.x509.DER_object.timestamp

Definition at line 148 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.240 rpki.x509.Ghostbuster Class Reference

Inheritance diagram for rpki.x509.Ghostbuster:

Collaboration diagram for rpki.x509.Ghostbuster:

Public Member Functions

- def build
- def build
- def decode
- def encode

Public Attributes

- content

Static Public Attributes

- content_class = rpki.ghostbuster.Ghostbuster
- tuple econtent_oid = POWify_OID("id-ct-rpkiGhostbusters")
- tuple pem_converter = PEM_converter("GHOSTBUSTERS RECORD")

  PEM converter for this object.

13.240.1 Detailed Description

```
Class to hold a signed Ghostbuster record.
```

```
Class to hold Ghostbusters record (CMS-wrapped VCard).  This is
quite minimal because we treat the VCard as an opaque byte string
managed by the back-end.
```

Definition at line 1123 of file x509.py.

13.240.2 Member Function Documentation

13.240.2.1 def rpki.x509.Ghostbuster.build (*cls, vcard, keypair, certs*)

Definition at line 1131 of file x509.py.

13.240.2.2 def rpki.x509.Ghostbuster.build (*cls, vcard, keypair, certs*)

```
Build a Ghostbuster record.
```

Definition at line 1265 of file x509.py.

13.240.2.3 def rpki.x509.Ghostbuster.decode (*self, vcard*)

```
Decode XML and set inner content.  At the moment we're treating
the VCard as an opaque byte string, so no encoding needed here.
```

Reimplemented from rpki.x509.DER_CMS_object.

Definition at line 1257 of file x509.py.

13.240.2.4 def rpki.x509.Ghostbuster.encode (*self*)

```
Encode inner content for signing.  At the moment we're treating
the VCard as an opaque byte string, so no encoding needed here.
```

Reimplemented from rpki.x509.DER_CMS_object.

Definition at line 1250 of file x509.py.

13.240.3 Member Data Documentation

13.240.3.1 rpki.x509.Ghostbuster.content

Reimplemented from rpki.x509.CMS_object.

Definition at line 1260 of file x509.py.

13.240.3.2 rpki.x509.Ghostbuster.content_class = rpki.ghostbuster.Ghostbuster [static]

Definition at line 1128 of file x509.py.

13.240.3.3 tuple rpki.x509.Ghostbuster.econtent_oid = POWify_OID("id-ct-rpkiGhostbusters") [static]

Reimplemented from rpki.x509.CMS_object.

Definition at line 1248 of file x509.py.

13.240.3.4 tuple rpki.x509.Ghostbuster.pem_converter = PEM_converter("GHOSTBUSTERS RECORD") [static]

PEM converter for this object.

Reimplemented from rpki.x509.CMS_object.

Definition at line 1247 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.241 rpki.x509.PEM_converter Class Reference

Inheritance diagram for rpki.x509.PEM_converter:

Collaboration diagram for rpki.x509.PEM_converter:

Public Member Functions

- def __init__
- def looks_like_PEM
- def to_DER
- def to_PEM

Public Attributes

- b
- e

13.241.1 Detailed Description

```
Convert between DER and PEM encodings for various kinds of ASN.1 data.
```

Definition at line 71 of file x509.py.

13.241.2 Constructor & Destructor Documentation

13.241.2.1 def rpki.x509.PEM_converter.__init__ (*self, kind*)

```
Initialize PEM_converter.
```

Definition at line 76 of file x509.py.

13.241.3 Member Function Documentation

13.241.3.1 def rpki.x509.PEM_converter.looks_like_PEM (*self, text*)

```
Guess whether text looks like a PEM encoding.
```

Definition at line 83 of file x509.py.

13.241.3.2 def rpki.x509.PEM_converter.to_DER (*self, pem*)

```
Convert from PEM to DER.
```

Definition at line 90 of file x509.py.

13.241.3.3 def rpki.x509.PEM_converter.to_PEM (*self, der*)

```
Convert from DER to PEM.
```

Definition at line 103 of file x509.py.

13.241.4 Member Data Documentation

13.241.4.1 rpki.x509.PEM_converter.b

Definition at line 78 of file x509.py.

13.241.4.2 rpki.x509.PEM_converter.e

Definition at line 78 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.242 rpki.x509.PKCS10 Class Reference

Inheritance diagram for rpki.x509.PKCS10:

Collaboration diagram for rpki.x509.PKCS10:

Public Member Functions

- def check_valid_rpki
- def create
- def create_ca
- def get_DER
- def get_POWpkix
- def getPublicKey

Public Attributes

- DER

  DER value of this object.

- POWpkix

Static Public Attributes

- tuple formats = ("DER", "POWpkix")

  Formats supported in this object.

- tuple pem_converter = PEM_converter("CERTIFICATE REQUEST")

  PEM converter for this object.

13.242.1 Detailed Description

```
Class to hold a PKCS #10 request.
```

Definition at line 600 of file x509.py.

13.242.2 Member Function Documentation

13.242.2.1 def rpki.x509.PKCS10.check_valid_rpki (*self*)

```
Check this certification request to see whether it's a valid
request for an RPKI certificate.  This is broken out of the
up-down protocol code because it's somewhat involved and the
up-down code doesn't need to know the details.

Throws an exception if the request isn't valid, so if this method
returns at all, the request is ok.
```

Definition at line 637 of file x509.py.

13.242.2.2 def rpki.x509.PKCS10.create (*cls, keypair, exts* = `None`)

```
Create a new request for a given keypair, including given extensions.
```

Definition at line 697 of file x509.py.

13.242.2.3 def rpki.x509.PKCS10.create_ca (*cls, keypair, sia* = `None`)

```
Create a new request for a given keypair, including given SIA value.
```

Definition at line 684 of file x509.py.

13.242.2.4 def rpki.x509.PKCS10.get_DER (*self*)

```
Get the DER value of this certification request.
```

Reimplemented from rpki.x509.DER_object.

Definition at line 608 of file x509.py.

13.242.2.5 def rpki.x509.PKCS10.get_POWpkix (*self*)

```
Get the rpki.POW.pkix value of this certification request.
```

Definition at line 620 of file x509.py.

13.242.2.6 def rpki.x509.PKCS10.getPublicKey (*self*)

```
Extract the public key from this certification request.
```

Definition at line 631 of file x509.py.

13.242.3 Member Data Documentation

13.242.3.1 rpki.x509.PKCS10.DER

DER value of this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 610 of file x509.py.

13.242.3.2 tuple rpki.x509.PKCS10.formats = ("DER", "POWpkix") [static]

Formats supported in this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 605 of file x509.py.

13.242.3.3 tuple rpki.x509.PKCS10.pem_converter = PEM_converter("CERTIFICATE REQUEST") [static]

PEM converter for this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 606 of file x509.py.

13.242.3.4 rpki.x509.PKCS10.POWpkix

Definition at line 622 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.243 rpki.x509.ROA Class Reference

Inheritance diagram for rpki.x509.ROA:

Collaboration diagram for rpki.x509.ROA:

Public Member Functions

- def build

Static Public Attributes

- content_class = rpki.roa.RouteOriginAttestation
- tuple econtent_oid = POWify_OID("id-ct-routeOriginAttestation")
- tuple pem_converter = PEM_converter("ROUTE ORIGIN ATTESTATION")

  PEM converter for this object.

13.243.1 Detailed Description

```
Class to hold a signed ROA.
```

Definition at line 1095 of file x509.py.

13.243.2 Member Function Documentation

13.243.2.1 def rpki.x509.ROA.build (*cls, asn, ipv4, ipv6, keypair, certs, version = 0*)

```
Build a ROA.
```

Definition at line 1105 of file x509.py.

13.243.3 Member Data Documentation

13.243.3.1 rpki.x509.ROA.content_class = rpki.roa.RouteOriginAttestation [static]

Definition at line 1101 of file x509.py.

13.243.3.2 tuple rpki.x509.ROA.econtent_oid = POWify_OID("id-ct-routeOriginAttestation") [static]

Reimplemented from rpki.x509.CMS_object.

Definition at line 1102 of file x509.py.

13.243.3.3 tuple rpki.x509.ROA.pem_converter = PEM_converter("ROUTE ORIGIN ATTESTATION") [static]

PEM converter for this object.

Reimplemented from rpki.x509.CMS_object.

Definition at line 1100 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.244 rpki.x509.RSA Class Reference

Inheritance diagram for rpki.x509.RSA:

Collaboration diagram for rpki.x509.RSA:

Public Member Functions

- def generate
- def get_DER
- def get_POW
- def get_public_DER
- def get_RSApublic
- def get_SKI

Public Attributes

- DER

  DER value of this object.

- POW

Static Public Attributes

- tuple formats = ("DER", "POW")

  Formats supported in this object.

- tuple pem_converter = PEM_converter("RSA PRIVATE KEY")

  PEM converter for this object.

13.244.1 Detailed Description

```
Class to hold an RSA key pair.
```

Definition at line 711 of file x509.py.

13.244.2 Member Function Documentation

13.244.2.1 def rpki.x509.RSA.generate (*cls*, *keylength* = `2048`)

```
Generate a new keypair.
```

Definition at line 741 of file x509.py.

13.244.2.2 def rpki.x509.RSA.get_DER (*self*)

```
Get the DER value of this keypair.
```

Reimplemented from rpki.x509.DER_object.

Definition at line 719 of file x509.py.

13.244.2.3 def rpki.x509.RSA.get_POW (*self*)

```
Get the rpki.POW value of this keypair.
```

Definition at line 731 of file x509.py.

13.244.2.4 def rpki.x509.RSA.get_public_DER (*self*)

```
Get the DER encoding of the public key from this keypair.
```

Definition at line 748 of file x509.py.

13.244.2.5 def rpki.x509.RSA.get_RSApublic (*self*)

```
Convert the public key of this keypair into a RSApublic object.
```

Definition at line 760 of file x509.py.

13.244.2.6 def rpki.x509.RSA.get_SKI (*self*)

```
Calculate the SKI of this keypair.
```

Reimplemented from rpki.x509.DER_object.

Definition at line 754 of file x509.py.

13.244.3 Member Data Documentation

13.244.3.1 rpki.x509.RSA.DER

DER value of this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 721 of file x509.py.

13.244.3.2 tuple rpki.x509.RSA.formats = ("DER", "POW") [static]

Formats supported in this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 716 of file x509.py.

13.244.3.3 tuple rpki.x509.RSA.pem_converter = PEM_converter("RSA PRIVATE KEY") [static]

PEM converter for this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 717 of file x509.py.

13.244.3.4 rpki.x509.RSA.POW

Definition at line 733 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.245 rpki.x509.RSApublic Class Reference

Inheritance diagram for rpki.x509.RSApublic:

Collaboration diagram for rpki.x509.RSApublic:

Public Member Functions

- def get_DER
- def get_POW
- def get_SKI

Public Attributes

- DER

  DER value of this object.

- POW

Static Public Attributes

- tuple formats = ("DER", "POW")

  Formats supported in this object.

- tuple pem_converter = PEM_converter("RSA PUBLIC KEY")

  PEM converter for this object.

13.245.1 Detailed Description

```
Class to hold an RSA public key.
```

Definition at line 766 of file x509.py.

13.245.2 Member Function Documentation

13.245.2.1 def rpki.x509.RSApublic.get_DER (*self*)

```
Get the DER value of this public key.
```

Reimplemented from rpki.x509.DER_object.

Definition at line 774 of file x509.py.

13.245.2.2 def rpki.x509.RSApublic.get_POW (*self*)

```
Get the rpki.POW value of this public key.
```

Definition at line 786 of file x509.py.

13.245.2.3 def rpki.x509.RSApublic.get_SKI (*self*)

```
Calculate the SKI of this public key.
```

Reimplemented from rpki.x509.DER_object.

Definition at line 795 of file x509.py.

13.245.3 Member Data Documentation

13.245.3.1 rpki.x509.RSApublic.DER

DER value of this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 776 of file x509.py.

13.245.3.2 tuple rpki.x509.RSApublic.formats = ("DER", "POW") [static]

Formats supported in this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 771 of file x509.py.

13.245.3.3 tuple rpki.x509.RSApublic.pem_converter = PEM_converter("RSA PUBLIC KEY") [static]

PEM converter for this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 772 of file x509.py.

13.245.3.4 rpki.x509.RSApublic.POW

Definition at line 788 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.246 rpki.x509.SignedManifest Class Reference

Inheritance diagram for rpki.x509.SignedManifest:

Collaboration diagram for rpki.x509.SignedManifest:

Public Member Functions

- def build
- def getNextUpdate
- def getThisUpdate

Static Public Attributes

- content_class = rpki.manifest.Manifest
- tuple econtent_oid = POWify_OID("id-ct-rpkiManifest")
- tuple pem_converter = PEM_converter("RPKI MANIFEST")

  PEM converter for this object.

13.246.1 Detailed Description

```
Class to hold a signed manifest.
```

Definition at line 1051 of file x509.py.

13.246.2 Member Function Documentation

13.246.2.1 def rpki.x509.SignedManifest.build (*cls, serial, thisUpdate, nextUpdate, names_and_objs, keypair, certs, version = 0*)

```
Build a signed manifest.
```

Definition at line 1073 of file x509.py.

13.246.2.2 def rpki.x509.SignedManifest.getNextUpdate (*self*)

```
Get nextUpdate value from this manifest.
```

Definition at line 1066 of file x509.py.

13.246.2.3 def rpki.x509.SignedManifest.getThisUpdate (*self*)

```
Get thisUpdate value from this manifest.
```

Definition at line 1060 of file x509.py.

13.246.3 Member Data Documentation

13.246.3.1 rpki.x509.SignedManifest.content_class = rpki.manifest.Manifest [static]

Definition at line 1057 of file x509.py.

13.246.3.2 tuple rpki.x509.SignedManifest.econtent_oid = POWify_OID("id-ct-rpkiManifest") [static]

Reimplemented from rpki.x509.CMS_object.

Definition at line 1058 of file x509.py.

13.246.3.3 tuple rpki.x509.SignedManifest.pem_converter = PEM_converter("RPKI MANIFEST") [static]

PEM converter for this object.

Reimplemented from rpki.x509.CMS_object.

Definition at line 1056 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.247 rpki.x509.X509 Class Reference

Inheritance diagram for rpki.x509.X509:

Collaboration diagram for rpki.x509.X509:

Public Member Functions

- def cross_certify
- def expired
- def get_DER
- def get_POW
- def get_POWpkix
- def getIssuer
- def getNotAfter
- def getNotBefore
- def getPublicKey
- def getSerial
- def getSubject
- def issue
- def normalize_chain

Public Attributes

- DER

  DER value of this object.

- POW
- POWpkix

Static Public Attributes

- tuple formats = ("DER", "POW", "POWpkix")

  Formats supported in this object.

- tuple pem_converter = PEM_converter("CERTIFICATE")

  PEM converter for this object.

13.247.1 Detailed Description

```
X.509 certificates.

This class is designed to hold all the different representations of
X.509 certs we're using and convert between them.  X.509 support in
Python a nasty maze of half-cooked stuff (except perhaps for
cryptlib, which is just different).  Users of this module should not
have to care about this implementation nightmare.
```

Definition at line 406 of file x509.py.

13.247.2 Member Function Documentation

13.247.2.1 def rpki.x509.X509.cross_certify (*self, keypair, source_cert, serial, notAfter, now = None, pathLenConstraint = 0*)

```
Issue a certificate with values taking from an existing certificate.
This is used to construct some kinds oF BPKI certificates.
```

Definition at line 558 of file x509.py.

13.247.2.2 def rpki.x509.X509.expired (*self*)

```
Test whether this certificate has expired.
```

Definition at line 491 of file x509.py.

13.247.2.3 def rpki.x509.X509.get_DER (*self*)

```
Get the DER value of this certificate.
```

Reimplemented from rpki.x509.DER_object.

Definition at line 420 of file x509.py.

13.247.2.4 def rpki.x509.X509.get_POW (*self*)

```
Get the rpki.POW value of this certificate.
```

Definition at line 435 of file x509.py.

13.247.2.5 def rpki.x509.X509.get_POWpkix (*self*)

```
Get the rpki.POW.pkix value of this certificate.
```

Definition at line 444 of file x509.py.

13.247.2.6 def rpki.x509.X509.getIssuer (*self*)

```
Get the issuer of this certificate.
```

Definition at line 455 of file x509.py.

13.247.2.7 def rpki.x509.X509.getNotAfter (*self*)

```
Get the expiration time of this certificate.
```

Definition at line 473 of file x509.py.

13.247.2.8 def rpki.x509.X509.getNotBefore (*self*)

```
Get the inception time of this certificate.
```

Definition at line 467 of file x509.py.

13.247.2.9 def rpki.x509.X509.getPublicKey (*self*)

```
Extract the public key from this certificate.
```

Definition at line 485 of file x509.py.

13.247.2.10 def rpki.x509.X509.getSerial (*self*)

```
Get the serial number of this certificate.
```

Definition at line 479 of file x509.py.

13.247.2.11 def rpki.x509.X509.getSubject (*self*)

```
Get the subject of this certificate.
```

Definition at line 461 of file x509.py.

13.247.2.12 def rpki.x509.X509.issue (*self, keypair, subject_key, serial, sia, aia, crldp, notAfter, cn* = **None**, *resources* = **None**, *is_ca* = **True**)

```
Issue a certificate.
```

Definition at line 497 of file x509.py.

13.247.2.13 def rpki.x509.X509.normalize_chain (*cls, chain*)

```
Normalize a chain of certificates into a tuple of X509 objects.
Given all the glue certificates needed for BPKI cross
certification, it's easiest to allow sloppy arguments to the CMS
validation methods and provide a single method that normalizes the
allowed cases.  So this method allows X509, None, lists, and
tuples, and returns a tuple of X509 objects.
```

Definition at line 587 of file x509.py.

13.247.3 Member Data Documentation

13.247.3.1 rpki.x509.X509.DER

DER value of this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 422 of file x509.py.

13.247.3.2 tuple rpki.x509.X509.formats = ("DER", "POW", "POWpkix") [static]

Formats supported in this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 417 of file x509.py.

13.247.3.3 tuple rpki.x509.X509.pem_converter = PEM_converter("CERTIFICATE") [static]

PEM converter for this object.

Reimplemented from rpki.x509.DER_object.

Definition at line 418 of file x509.py.

13.247.3.4 rpki.x509.X509.POW

Definition at line 437 of file x509.py.

13.247.3.5 rpki.x509.X509.POWpkix

Definition at line 446 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.248 rpki.x509.XML_CMS_object Class Reference

Inheritance diagram for rpki.x509.XML_CMS_object:

Collaboration diagram for rpki.x509.XML_CMS_object:

Public Member Functions

- def decode
- def dump_to_disk
- def encode
- def pretty_print_content
- def schema_check
- def unwrap
- def wrap

Public Attributes

- content

Static Public Attributes

- dump_inbound_cms = None

  If set, we write all inbound XML-CMS PDUs to disk, for debugging.

- dump_outbound_cms = None

  If set, we write all outbound XML-CMS PDUs to disk, for debugging.

- tuple econtent_oid = POWify_OID("id-ct-xml")

13.248.1 Detailed Description

```
Class to hold CMS-wrapped XML protocol data.
```

Definition at line 1161 of file x509.py.

13.248.2 Member Function Documentation

13.248.2.1 def rpki.x509.XML_CMS_object.decode (*self, xml*)

```
Decode XML and set inner content.
```

Definition at line 1186 of file x509.py.

13.248.2.2 def rpki.x509.XML_CMS_object.dump_to_disk (*self, prefix*)

```
Write DER of current message to disk, for debugging.
```

Definition at line 1210 of file x509.py.

13.248.2.3 def rpki.x509.XML_CMS_object.encode (*self*)

```
Encode inner content for signing.
```

Definition at line 1180 of file x509.py.

13.248.2.4 def rpki.x509.XML_CMS_object.pretty_print_content (*self*)

```
Pretty print XML content of this message.
```

Definition at line 1192 of file x509.py.

13.248.2.5 def rpki.x509.XML_CMS_object.schema_check (*self*)

```
Handle XML RelaxNG schema check.
```

Definition at line 1198 of file x509.py.

13.248.2.6 def rpki.x509.XML_CMS_object.unwrap (*self, ta*)

```
Unwrap a CMS-wrapped XML PDU and return Python objects.
```

Definition at line 1230 of file x509.py.

13.248.2.7 def rpki.x509.XML_CMS_object.wrap (*self, msg, keypair, certs, crls* = `None`)

```
Wrap an XML PDU in CMS and return its DER encoding.
```

Definition at line 1218 of file x509.py.

13.248.3 Member Data Documentation

13.248.3.1 rpki.x509.XML_CMS_object.content

Reimplemented from rpki.x509.CMS_object.

Definition at line 1188 of file x509.py.

13.248.3.2 rpki::x509.XML_CMS_object::dump_inbound_cms = None [static]

If set, we write all inbound XML-CMS PDUs to disk, for debugging.

If set, value should be a DeadDrop object.

Definition at line 1178 of file x509.py.

13.248.3.3 rpki::x509.XML_CMS_object::dump_outbound_cms = None [static]

If set, we write all outbound XML-CMS PDUs to disk, for debugging.

If set, value should be a DeadDrop object.

Definition at line 1172 of file x509.py.

13.248.3.4 tuple rpki.x509.XML_CMS_object.econtent_oid = POWify_OID("id-ct-xml") [static]

Reimplemented from rpki.x509.CMS_object.

Definition at line 1166 of file x509.py.

The documentation for this class was generated from the following file:

- x509.py (3869)

13.249 rpki.xml_utils.base_elt Class Reference

Inheritance diagram for rpki.xml_utils.base_elt:

Collaboration diagram for rpki.xml_utils.base_elt:

Public Member Functions

- def __str__
- def endElement
- def make_b64elt
- def make_elt

- def make_pdu
- def read_attrs
- def startElement
- def toXML

Static Public Attributes

- tuple attributes = ()

  XML attributes for this element.

- tuple booleans = ()

  Boolean attributes (value "yes" or "no") for this element.

- tuple elements = ()

  XML elements contained by this element.

13.249.1 Detailed Description

```
Virtual base class for XML message elements.  The left-right and
publication protocols use this.  At least for now, the up-down
protocol does not, due to different design assumptions.
```

Definition at line 132 of file xml_utils.py.

13.249.2 Member Function Documentation

13.249.2.1 def rpki.xml_utils.base_elt.__str__ (*self*)

```
Convert a base_elt object to string format.
```

Reimplemented in rpki.publication.report_error_elt.

Definition at line 205 of file xml_utils.py.

13.249.2.2 def rpki.xml_utils.base_elt.endElement (*self, stack, name, text*)

```
Default endElement() handler: just pop the stack.
```

Reimplemented in rpki.publication.publication_object_elt, rpki.xml_utils.text_elt, and rpki.xml_utils.data_elt.

Definition at line 159 of file xml_utils.py.

13.249.2.3 def rpki.xml_utils.base_elt.make_b64elt (*self, elt, name, value*)

```
Constructor for Base64-encoded subelement.
```

Definition at line 198 of file xml_utils.py.

13.249.2.4 def rpki.xml_utils.base_elt.make_elt (*self*)

```
XML element constructor.
```

Definition at line 184 of file xml_utils.py.

13.249.2.5 def rpki.xml_utils.base_elt.make_pdu (*cls, kargs*)

```
Generic PDU constructor.
```

Definition at line 212 of file xml_utils.py.

13.249.2.6 def rpki.xml_utils.base_elt.read_attrs (*self, attrs*)

```
Template-driven attribute reader.
```

Definition at line 172 of file xml_utils.py.

13.249.2.7 def rpki.xml_utils.base_elt.startElement (*self, stack, name, attrs*)

```
Default startElement() handler: just process attributes.
```

Reimplemented in rpki.left_right.list_resources_elt, rpki.left_right.list_roa_requests_-elt, and rpki.publication.config_elt.

Definition at line 151 of file xml_utils.py.

13.249.2.8 def rpki.xml_utils.base_elt.toXML (*self*)

```
Default toXML() element generator.
```

Reimplemented in rpki.left_right.list_resources_elt, rpki.publication.publication_object_-elt, rpki.xml_utils.text_elt, and rpki.xml_utils.data_elt.

Definition at line 166 of file xml_utils.py.

13.249.3 Member Data Documentation

13.249.3.1 rpki::xml_utils.base_elt::attributes = () [static]

XML attributes for this element.

Reimplemented in rpki.left_right.self_elt, rpki.left_right.bsc_elt, rpki.left_right.repository_-elt, rpki.left_right.parent_elt, rpki.left_right.child_elt, rpki.left_right.list_resources_-elt, rpki.left_right.list_roa_requests_elt, rpki.left_right.list_ghostbuster_requests_elt, rpki.left_-right.list_published_objects_elt, rpki.left_right.list_received_resources_elt, rpki.left_-right.report_error_elt, rpki.publication.config_elt, rpki.publication.client_elt, rpki.publication.publication_-object_elt, and rpki.publication.report_error_elt.

Definition at line 141 of file xml_utils.py.

13.249.3.2 rpki::xml_utils.base_elt::booleans = () [static]

Boolean attributes (value "yes" or "no") for this element.

Reimplemented in rpki.left_right.self_elt, rpki.left_right.bsc_elt, rpki.left_right.parent_-elt, and rpki.left_right.child_elt.

Definition at line 149 of file xml_utils.py.

13.249.3.3 rpki::xml_utils.base_elt::elements = () [static]

XML elements contained by this element.

Reimplemented in rpki.left_right.self_elt, rpki.left_right.bsc_elt, rpki.left_right.repository_-elt, rpki.left_right.parent_elt, rpki.left_right.child_elt, rpki.publication.config_elt, and rpki.publication.client_elt.

Definition at line 145 of file xml_utils.py.

The documentation for this class was generated from the following file:

- xml_utils.py (3725)

13.250 rpki.xml_utils.data_elt Class Reference

Inheritance diagram for rpki.xml_utils.data_elt:

Collaboration diagram for rpki.xml_utils.data_elt:

Public Member Functions

- def endElement
- def make_reply
- def make_reply_clone_hook
- def serve_create
- def serve_destroy
- def serve_destroy_hook
- def serve_dispatch
- def serve_fetch_one
- def serve_get
- def serve_list
- def serve_post_save_hook
- def serve_pre_save_hook
- def serve_set
- def toXML
- def unimplemented_control

13.250.1 Detailed Description

```
Virtual base class for PDUs that map to SQL objects.  These objects
all implement the create/set/get/list/destroy action attribute.
```

Definition at line 247 of file xml_utils.py.

13.250.2 Member Function Documentation

13.250.2.1 def rpki.xml_utils.data_elt.endElement (*self, stack, name, text*)

```
Default endElement handler for SQL-based objects.  This assumes
that sub-elements are Base64-encoded using the sql_template
mechanism.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 253 of file xml_utils.py.

13.250.2.2 def rpki.xml_utils.data_elt.make_reply (*self, r_pdu* = `None`)

```
Construct a reply PDU.
```

Definition at line 277 of file xml_utils.py.

13.250.2.3 def rpki.xml_utils.data_elt.make_reply_clone_hook (*self, r_pdu*)

```
Overridable hook.
```

Reimplemented in rpki.left_right.data_elt.

Definition at line 294 of file xml_utils.py.

13.250.2.4 def rpki.xml_utils.data_elt.serve_create (*self, r_msg, cb, eb*)

```
Handle a create action.
```

Definition at line 322 of file xml_utils.py.

13.250.2.5 def rpki.xml_utils.data_elt.serve_destroy (*self, r_msg, cb, eb*)

```
Handle a destroy action.
```

Definition at line 392 of file xml_utils.py.

13.250.2.6 def rpki.xml_utils.data_elt.serve_destroy_hook (*self, cb, eb*)

```
Overridable hook.
```

Reimplemented in rpki.left_right.child_elt.

Definition at line 386 of file xml_utils.py.

13.250.2.7 def rpki.xml_utils.data_elt.serve_dispatch (*self, r_msg, cb, eb*)

```
Action dispatch handler.
```

Reimplemented in rpki.publication.control_elt.

Definition at line 403 of file xml_utils.py.

13.250.2.8 def rpki.xml_utils.data_elt.serve_fetch_one (*self*)

```
Find the object on which a get, set, or destroy method should
operate.
```

Definition at line 300 of file xml_utils.py.

13.250.2.9 def rpki.xml_utils.data_elt.serve_get (*self, r_msg, cb, eb*)

```
Handle a get action.
```

Definition at line 368 of file xml_utils.py.

13.250.2.10 def rpki.xml_utils.data_elt.serve_list (*self, r_msg, cb, eb*)

```
Handle a list action for non-self objects.
```

Definition at line 377 of file xml_utils.py.

13.250.2.11 def rpki.xml_utils.data_elt.serve_post_save_hook (*self, q_pdu, r_pdu, cb, eb*)

```
Overridable hook.
```

Reimplemented in rpki.left_right.self_elt, rpki.left_right.parent_elt, and rpki.left_right.child_-elt.

Definition at line 316 of file xml_utils.py.

13.250.2.12 def rpki.xml_utils.data_elt.serve_pre_save_hook (*self, q_pdu, r_pdu, cb, eb*)

```
Overridable hook.
```

Reimplemented in rpki.left_right.data_elt, and rpki.left_right.bsc_elt.

Definition at line 310 of file xml_utils.py.

13.250.2.13 def rpki.xml_utils.data_elt.serve_set (*self, r_msg, cb, eb*)

```
Handle a set action.
```

Reimplemented in rpki.publication.config_elt.

Definition at line 345 of file xml_utils.py.

13.250.2.14 def rpki.xml_utils.data_elt.toXML (*self*)

```
Default element generator for SQL-based objects.  This assumes
that sub-elements are Base64-encoded DER objects.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 267 of file xml_utils.py.

13.250.2.15 def rpki.xml_utils.data_elt.unimplemented_control (*self, controls*)

```
Uniform handling for unimplemented control operations.
```

Definition at line 416 of file xml_utils.py.

The documentation for this class was generated from the following file:

- xml_utils.py (3725)

13.251 rpki.xml_utils.msg Class Reference

Inheritance diagram for rpki.xml_utils.msg:

Collaboration diagram for rpki.xml_utils.msg:

Public Member Functions

- def __str__
- def endElement
- def is_query
- def is_reply
- def query
- def reply
- def startElement
- def toXML

Public Attributes

- type
- version

13.251.1 Detailed Description

```
Generic top-level PDU.
```

Definition at line 424 of file xml_utils.py.

13.251.2 Member Function Documentation

13.251.2.1 def rpki.xml_utils.msg.__str__ (*self*)

```
Convert msg object to string.
```

Definition at line 450 of file xml_utils.py.

13.251.2.2 def rpki.xml_utils.msg.endElement (*self, stack, name, text*)

```
Handle top-level PDU.
```

Definition at line 442 of file xml_utils.py.

13.251.2.3 def rpki.xml_utils.msg.is_query (*self*)

```
Is this msg a query?
```

Definition at line 482 of file xml_utils.py.

13.251.2.4 def rpki.xml_utils.msg.is_reply (*self*)

```
Is this msg a reply?
```

Definition at line 488 of file xml_utils.py.

13.251.2.5 def rpki.xml_utils.msg.query (*cls, args*)

```
Create a query PDU.
```

Definition at line 465 of file xml_utils.py.

13.251.2.6 def rpki.xml_utils.msg.reply (*cls, args*)

```
Create a reply PDU.
```

Definition at line 474 of file xml_utils.py.

13.251.2.7 def rpki.xml_utils.msg.startElement (*self, stack, name, attrs*)

```
Handle top-level PDU.
```

Definition at line 429 of file xml_utils.py.

13.251.2.8 def rpki.xml_utils.msg.toXML (*self*)

```
Generate top-level PDU.
```

Definition at line 456 of file xml_utils.py.

13.251.3 Member Data Documentation

13.251.3.1 rpki.xml_utils.msg.type

Definition at line 431 of file xml_utils.py.

13.251.3.2 rpki.xml_utils.msg.version

Reimplemented in rpki.left_right.msg, and rpki.publication.msg.

Definition at line 431 of file xml_utils.py.

The documentation for this class was generated from the following file:

- xml_utils.py (3725)

13.252 rpki.xml_utils.sax_handler Class Reference

Inheritance diagram for rpki.xml_utils.sax_handler:

Collaboration diagram for rpki.xml_utils.sax_handler:

Public Member Functions

- def __init__
- def characters
- def create_top_level
- def endElement
- def endElementNS
- def saxify
- def startElement
- def startElementNS

Public Attributes

- result
- stack
- text

13.252.1 Detailed Description

```
SAX handler for RPKI protocols.

This class provides some basic amenities for parsing protocol XML of
the kind we use in the RPKI protocols, including whacking all the
protocol element text into US-ASCII, simplifying accumulation of
text fields, and hiding some of the fun relating to XML namespaces.

General assumption: by the time this parsing code gets invoked, the
XML has already passed RelaxNG validation, so we only have to check
for errors that the schema can't catch, and we don't have to play as
many XML namespace games.
```

Definition at line 38 of file xml_utils.py.

13.252.2 Constructor & Destructor Documentation

13.252.2.1 def rpki.xml_utils.sax_handler.__init__ (*self*)

```
Initialize SAX handler.
```

Definition at line 53 of file xml_utils.py.

13.252.3 Member Function Documentation

13.252.3.1 def rpki.xml_utils.sax_handler.characters (*self, content*)

```
Accumulate a chuck of element content (text).
```

Definition at line 73 of file xml_utils.py.

13.252.3.2 def rpki.xml_utils.sax_handler.create_top_level (*self, name, attrs*)

```
Handle top-level PDU for this protocol.
```

Definition at line 125 of file xml_utils.py.

13.252.3.3 def rpki.xml_utils.sax_handler.endElement (*self, name*)

```
Handle endElement() events.  Mostly this means handling any
accumulated element text.
```

Definition at line 107 of file xml_utils.py.

13.252.3.4 def rpki.xml_utils.sax_handler.endElementNS (*self, name, qname*)

```
Redirect endElementNS() events to endElement().
```

Definition at line 67 of file xml_utils.py.

13.252.3.5 def rpki.xml_utils.sax_handler.saxify (*cls, elt*)

```
Create a one-off SAX parser, parse an ETree, return the result.
```

Definition at line 117 of file xml_utils.py.

13.252.3.6 def rpki.xml_utils.sax_handler.startElement (*self, name, attrs*)

```
Handle startElement() events.

We maintain a stack of nested elements under construction so that
we can feed events directly to the current element rather than
having to pass them through all the nesting elements.

If the stack is empty, this event is for the outermost element, so
we call a virtual method to create the corresponding object and
that's the object we'll be returning as our final result.
```

Definition at line 79 of file xml_utils.py.

13.252.3.7 def rpki.xml_utils.sax_handler.startElementNS (*self, name, qname, attrs*)

```
Redirect startElementNS() events to startElement().
```

Definition at line 61 of file xml_utils.py.

13.252.4 Member Data Documentation

13.252.4.1 rpki.xml_utils.sax_handler.result

Definition at line 89 of file xml_utils.py.

13.252.4.2 rpki.xml_utils.sax_handler.stack

Definition at line 55 of file xml_utils.py.

13.252.4.3 rpki.xml_utils.sax_handler.text

Definition at line 55 of file xml_utils.py.

The documentation for this class was generated from the following file:

- xml_utils.py (3725)

13.253 rpki.xml_utils.text_elt Class Reference

Inheritance diagram for rpki.xml_utils.text_elt:

Collaboration diagram for rpki.xml_utils.text_elt:

Public Member Functions

- def endElement
- def toXML

Static Public Attributes

- text_attribute = None

  Name of the class attribute that holds the text value.

13.253.1 Detailed Description

```
Virtual base class for XML message elements that contain text.
```

Definition at line 223 of file xml_utils.py.

13.253.2 Member Function Documentation

13.253.2.1 def rpki.xml_utils.text_elt.endElement (*self, stack, name, text*)

```
Extract text from parsed XML.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 232 of file xml_utils.py.

13.253.2.2 def rpki.xml_utils.text_elt.toXML (*self*)

```
Insert text into generated XML.
```

Reimplemented from rpki.xml_utils.base_elt.

Definition at line 239 of file xml_utils.py.

13.253.3 Member Data Documentation

13.253.3.1 rpki::xml_utils.text_elt::text_attribute = None [static]

Name of the class attribute that holds the text value.

Reimplemented in rpki.left_right.list_ghostbuster_requests_elt, rpki.left_right.list_published_-objects_elt, rpki.left_right.report_error_elt, and rpki.publication.report_error_elt.

Definition at line 230 of file xml_utils.py.

The documentation for this class was generated from the following file:

- xml_utils.py (3725)

13.254 Sequence Class Reference

Inheritance diagram for Sequence:

The documentation for this class was generated from the following file:

- roa.py (3598)

13.255 SequenceOf Class Reference

Inheritance diagram for SequenceOf:

The documentation for this class was generated from the following file:

- roa.py (3598)

13.256 set Class Reference

Inheritance diagram for set:

The documentation for this class was generated from the following file:

- myrpki.py (3793)

13.257 TextWrapper Class Reference

Inheritance diagram for TextWrapper:

The documentation for this class was generated from the following file:

- irbe_cli.py (3711)

13.258 ContentHandler Class Reference

Inheritance diagram for ContentHandler:

The documentation for this class was generated from the following file:

- xml_utils.py (3725)

14 File Documentation

14.1 __doc__.py File Reference

Packages

- package rpki.__doc__

14.1.1 Detailed Description

Documentation sourc, expressed as Python comments to make Doxygen happy.

Id:

__doc__.py 3902 2011-06-27 18:31:02Z sra

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Definition in file __doc__.py.

14.2 __init__.py File Reference

Packages

- package rpki

14.3 adns.py File Reference

Classes

- class rpki.adns.dispatcher
- class rpki.adns.getaddrinfo
- class rpki.adns.query
- class rpki.adns.test_getaddrinfo
- class rpki.adns.test_query

Packages

- package rpki.adns

Variables

- list rpki::adns.nameservers = [ ]

  Nameservers from resolver.nameservers converted to (af, address) pairs.

- tuple rpki::adns.resolver = dns.resolver.Resolver()

  Resolver object, shared by everything using this module.

14.4 async.py File Reference

Classes

- class rpki.async.gc_summary
- class rpki.async.iterator
- class rpki.async.sync_wrapper
- class rpki.async.timer

Packages

- package rpki.async

Functions

- def rpki::async._raiseExitNow
- def rpki::async.defer
- def rpki::async.event_loop
- def rpki::async.exit_event_loop
- def rpki::async.run_deferred

Variables

- list rpki::async.deferred_queue = [ ]

  List to hold deferred actions.

- rpki::async.ExitNow = asyncore.ExitNow

14.5 cli.py File Reference

Classes

- class rpki.cli.Cmd

Packages

- package rpki.cli

Functions

- def rpki::cli.yes_or_no

Variables

- dictionary rpki::cli._yes_or_no_prompts
- rpki::cli.have_readline = True

14.6 config.py File Reference

Classes

- class rpki.config.parser

Packages

- package rpki.config

Variables

- rpki::config.default_dirname = None

  Default name of directory to check for global config file, or None if no global config file.

- string rpki::config.default_envname = "RPKI_CONF"

  Name of environment variable containing config file name.

- string rpki::config.default_filename = "rpki.conf"

  Default name of config file if caller doesn't specify one explictly.

14.7 exceptions.py File Reference

Classes

- class rpki.exceptions.BadClassNameSyntax
- class rpki.exceptions.BadClientURL
- class rpki.exceptions.BadContactURL
- class rpki.exceptions.BadExtension
- class rpki.exceptions.BadIPResource
- class rpki.exceptions.BadIRDBReply
- class rpki.exceptions.BadIssueResponse
- class rpki.exceptions.BadPKCS10
- class rpki.exceptions.BadPublicationReply
- class rpki.exceptions.BadQuery
- class rpki.exceptions.BadROAPrefix
- class rpki.exceptions.BadSender
- class rpki.exceptions.BadStatusCode
- class rpki.exceptions.BadURISyntax
- class rpki.exceptions.BSCNotFound

- class rpki.exceptions.BSCNotReady
- class rpki.exceptions.ChildNotFound
- class rpki.exceptions.ClassNameMismatch
- class rpki.exceptions.ClassNameUnknown
- class rpki.exceptions.ClientNotFound
- class rpki.exceptions.CMSContentNotSet
- class rpki.exceptions.CMSCRLNotSet
- class rpki.exceptions.CMSVerificationFailed
- class rpki.exceptions.CommandParseFailure
- class rpki.exceptions.DBConsistancyError
- class rpki.exceptions.DERObjectConversionError
- class rpki.exceptions.DuplicateObject
- class rpki.exceptions.EmptyPEM
- class rpki.exceptions.EmptyROAPrefixList
- class rpki.exceptions.ForbiddenURI
- class rpki.exceptions.HandleTranslationError
- class rpki.exceptions.HTTPBadVersion
- class rpki.exceptions.HTTPClientAborted
- class rpki.exceptions.HTTPRequestFailed
- class rpki.exceptions.HTTPTimeout
- class rpki.exceptions.HTTPUnexpectedState
- class rpki.exceptions.MissingCMSCRL
- class rpki.exceptions.MissingCMSEEcert
- class rpki.exceptions.MultipleTLSEECert
- class rpki.exceptions.MustBePrefix
- class rpki.exceptions.NoActiveCA
- class rpki.exceptions.NoCoveringCertForROA
- class rpki.exceptions.NoObjectAtURI
- class rpki.exceptions.NotACertificateChain
- class rpki.exceptions.NotFound
- class rpki.exceptions.NotImplementedYet
- class rpki.exceptions.NotInDatabase
- class rpki.exceptions.ReceivedTLSCACert
- class rpki.exceptions.RPKI_Exception
- class rpki.exceptions.ServerShuttingDown
- class rpki.exceptions.SKIMismatch
- class rpki.exceptions.SubprocessError
- class rpki.exceptions.TLSValidationError
- class rpki.exceptions.UnexpectedCMSCerts
- class rpki.exceptions.UnexpectedCMSCRLs
- class rpki.exceptions.UnparsableCMSDER
- class rpki.exceptions.UpstreamError
- class rpki.exceptions.WrongEContentType

Packages

- package rpki.exceptions

14.8 ghostbuster.py File Reference

Classes

- class rpki.ghostbuster.Ghostbuster

Packages

- package rpki.ghostbuster

14.9 http.py File Reference

Classes

- class rpki.http.caller
- class rpki.http.http_client
- class rpki.http.http_listener
- class rpki.http.http_message
- class rpki.http.http_queue
- class rpki.http.http_request
- class rpki.http.http_response
- class rpki.http.http_server
- class rpki.http.http_stream

Packages

- package rpki.http

Functions

- def rpki::http.addr_to_string
- def rpki::http.client
- def rpki::http.localhost_addrinfo
- def rpki::http.log_method
- def rpki::http.server
- def rpki::http.supported_address_families

Variables

- dictionary rpki::http.client_queues = { }

  Map of (host, port) tuples to http_queue objects.

- rpki::http.debug_http = False

  Verbose chatter about HTTP streams.

- tuple rpki::http.default_client_timeout = rpki.sundial.timedelta(minutes = 15)

  Default HTTP client connection timeout.

- tuple rpki::http.default_http_version = (1, 0)

  Preferred HTTP version.

- tuple rpki::http.default_server_timeout = rpki.sundial.timedelta(minutes = 20)

  Default HTTP server connection timeouts.

- int rpki::http.default_tcp_port = 80

  Default port for clients and servers that don't specify one.

- rpki::http.enable_ipv6_clients = False

  Whether to consider IPv6 addresses when making connections.

- rpki::http.enable_ipv6_servers = True

  Whether to enable IPv6 listeners.

- rpki::http.have_ipv6 = False

  Whether the current machine claims to support IPv6.

- string rpki::http.rpki_content_type = "application/x-rpki"

  HTTP content type used for all RPKI messages.

- rpki::http.use_adns = False

  Whether to use rpki.adns code.

- rpki::http.want_persistent_client = False

  Whether we want persistent HTTP client streams, when server also supports them.

- rpki::http.want_persistent_server = False

  Whether we want persistent HTTP server streams, when client also supports them.

14.10 ipaddrs.py File Reference

Classes

- class rpki.ipaddrs.v4addr
- class rpki.ipaddrs.v6addr

Packages

- package rpki.ipaddrs

Functions

- def rpki::ipaddrs.parse

14.11 irbe_cli.py File Reference

Classes

- class irbe_cli.bsc_elt
- class irbe_cli.certificate_elt
- class irbe_cli.child_elt
- class irbe_cli.client_elt
- class irbe_cli.cmd_elt_mixin
- class irbe_cli.cmd_msg_mixin
- class irbe_cli.config_elt
- class irbe_cli.crl_elt
- class irbe_cli.left_right_cms_msg
- class irbe_cli.left_right_msg
- class irbe_cli.left_right_proto
- class irbe_cli.left_right_sax_handler
- class irbe_cli.list_published_objects_elt
- class irbe_cli.list_received_resources_elt
- class irbe_cli.manifest_elt
- class irbe_cli.parent_elt
- class irbe_cli.publication_cms_msg
- class irbe_cli.publication_msg
- class irbe_cli.publication_proto
- class irbe_cli.publication_sax_handler
- class irbe_cli.reply_elt_mixin
- class irbe_cli.report_error_elt
- class irbe_cli.report_error_elt

- class irbe_cli.repository_elt
- class irbe_cli.roa_elt
- class irbe_cli.self_elt
- class irbe_cli.UsageWrapper

Packages

- package irbe_cli

Functions

- def irbe_cli.usage

Variables

- list irbe_cli.argv = sys.argv[1:]
- tuple irbe_cli.cfg = rpki.config.parser(cfg_file, "irbe_cli")
- irbe_cli.cfg_file = None
- tuple irbe_cli.client_cert = rpki.x509.X509(Auto_file = cfg.get("rpkid-irbe-cert"))
- tuple irbe_cli.client_key = rpki.x509.RSA(Auto_file = cfg.get("rpkid-irbe-key"))
- irbe_cli.debug = verbose))
- irbe_cli.pem_out = None
- irbe_cli.proto = left_right_proto,
- irbe_cli.q_msg = q_msg_left_right
- list irbe_cli.q_msg_left_right = [ ]
- list irbe_cli.q_msg_publication = [ ]
- list irbe_cli.q_pdu = left_right_msg.pdus[argv[0]]
- tuple irbe_cli.server_cert = rpki.x509.X509(Auto_file = cfg.get("rpkid-cert"))
- tuple irbe_cli.server_ta = rpki.x509.X509(Auto_file = cfg.get("rpkid-bpki-ta"))
- list irbe_cli.top_opts = ["config=", "help", "pem_out=", "quiet", "verbose"]
- tuple irbe_cli.url = cfg.get("rpkid-url")
- tuple irbe_cli.usage_fill = UsageWrapper(subsequent_indent = " " $*$ 4)
- irbe_cli.verbose = True

14.12 irdbd.py File Reference

Classes

- class rpki.irdbd.main

Packages

- package rpki.irdbd

14.13 irdbd.py File Reference

Packages

- package irdbd

14.14 left_right.py File Reference

Classes

- class rpki.left_right.bsc_elt
- class rpki.left_right.child_elt
- class rpki.left_right.cms_msg
- class rpki.left_right.data_elt
- class rpki.left_right.left_right_namespace
- class rpki.left_right.list_ghostbuster_requests_elt
- class rpki.left_right.list_published_objects_elt
- class rpki.left_right.list_received_resources_elt
- class rpki.left_right.list_resources_elt
- class rpki.left_right.list_roa_requests_elt
- class rpki.left_right.msg
- class rpki.left_right.parent_elt
- class rpki.left_right.report_error_elt
- class rpki.left_right.repository_elt
- class rpki.left_right.sax_handler
- class rpki.left_right.self_elt

Packages

- package rpki.left_right

Variables

- rpki::left_right.enforce_strict_up_down_xml_sender = False

14.15 log.py File Reference

Classes

- class rpki.log.logger

Packages

- package rpki.log

Functions

- def rpki::log.init
- def rpki::log.log_repr
- def rpki::log.set_trace
- def rpki::log.trace
- def rpki::log.traceback

Variables

- tuple rpki::log.debug = logger(syslog.LOG_DEBUG)
- rpki::log.enable_trace = False

  Whether call tracing is enabled.

- tuple rpki::log.error = logger(syslog.LOG_ERR)
- tuple rpki::log.info = logger(syslog.LOG_INFO)
- tuple rpki::log.note = logger(syslog.LOG_NOTICE)
- int rpki::log.pid = 0
- rpki::log.show_python_ids = False

  Whether __repr__() methods should show Python id numbers.

- string rpki::log.tag = ""
- rpki::log.use_syslog = True

  Whether to use syslog.

- tuple rpki::log.warn = logger(syslog.LOG_WARNING)

14.16 manifest.py File Reference

Classes

- class rpki.manifest.FileAndHash
- class rpki.manifest.FilesAndHashes
- class rpki.manifest.Manifest

Packages

- package rpki.manifest

14.17 myrpki.py File Reference

Classes

- class rpki.myrpki.CA
- class rpki.myrpki.child
- class rpki.myrpki.children
- class rpki.myrpki.comma_set
- class rpki.myrpki.csv_reader
- class rpki.myrpki.csv_writer
- class rpki.myrpki.EntityDB
- class rpki.myrpki.IRDB
- class rpki.myrpki.main
- class rpki.myrpki.parent
- class rpki.myrpki.parents
- class rpki.myrpki.repositories
- class rpki.myrpki.repository
- class rpki.myrpki.roa_request
- class rpki.myrpki.roa_requests

Packages

- package rpki.myrpki

Functions

- def rpki::myrpki.b64_equal
- def rpki::myrpki.etree_post_read
- def rpki::myrpki.etree_pre_write
- def rpki::myrpki.etree_read

- def rpki::myrpki.etree_validate
- def rpki::myrpki.etree_write
- def rpki::myrpki.PEMBase64
- def rpki::myrpki.PEMElement

Variables

- rpki::myrpki.allow_incomplete = False
- string rpki::myrpki.namespace = "http://www.hactrn.net/uris/rpki/myrpki/"
- string rpki::myrpki.namespaceQName = "{"
- string rpki::myrpki.version = "2"
- rpki::myrpki.whine = True

14.18 oids.py File Reference

Packages

- package rpki.oids

Variables

- tuple rpki::oids.name2oid = dict((v, k) for k, v in oid2name.items())

  Mapping table of string names to OIDs.

- dictionary rpki::oids.oid2name

  Mapping table of OIDs to conventional string names.

14.19 pubd.py File Reference

Classes

- class rpki.pubd.main

Packages

- package rpki.pubd

14.20 pubd.py File Reference

Packages

- package pubd

14.21 publication.py File Reference

Classes

- class rpki.publication.certificate_elt
- class rpki.publication.client_elt
- class rpki.publication.cms_msg
- class rpki.publication.config_elt
- class rpki.publication.control_elt
- class rpki.publication.crl_elt
- class rpki.publication.ghostbuster_elt
- class rpki.publication.manifest_elt
- class rpki.publication.msg
- class rpki.publication.publication_namespace
- class rpki.publication.publication_object_elt
- class rpki.publication.report_error_elt
- class rpki.publication.roa_elt
- class rpki.publication.sax_handler

Packages

- package rpki.publication

14.22 rcynic.py File Reference

Classes

- class rpki.rcynic.NotRsyncURI
- class rpki.rcynic.rcynic_certificate
- class rpki.rcynic.rcynic_file_iterator
- class rpki.rcynic.rcynic_ghostbuster
- class rpki.rcynic.rcynic_object
- class rpki.rcynic.rcynic_roa
- class rpki.rcynic.rcynic_xml_iterator
- class rpki.rcynic.UnknownObject

Packages

- package rpki.rcynic

Functions

- def rpki::rcynic.label_iterator

Variables

- dictionary rpki::rcynic.file_name_classes
- tuple rpki::rcynic.rcynic_dir = os.path.normpath(os.path.join(sys.path[0], "..", "rcynic"))

14.23 relaxng.py File Reference

Packages

- package rpki.relaxng

Variables

- tuple rpki::relaxng.left_right

  Parsed RelaxNG left_right schema.

- tuple rpki::relaxng.publication

  Parsed RelaxNG publication schema.

- tuple rpki::relaxng.up_down

  Parsed RelaxNG up_down schema.

14.24 resource_set.py File Reference

Classes

- class rpki.resource_set.resource_bag
- class rpki.resource_set.resource_range
- class rpki.resource_set.resource_range_as
- class rpki.resource_set.resource_range_ip
- class rpki.resource_set.resource_range_ipv4
- class rpki.resource_set.resource_range_ipv6

- class rpki.resource_set.resource_set
- class rpki.resource_set.resource_set_as
- class rpki.resource_set.resource_set_ip
- class rpki.resource_set.resource_set_ipv4
- class rpki.resource_set.resource_set_ipv6
- class rpki.resource_set.roa_prefix
- class rpki.resource_set.roa_prefix_ipv4
- class rpki.resource_set.roa_prefix_ipv6
- class rpki.resource_set.roa_prefix_set
- class rpki.resource_set.roa_prefix_set_ipv4
- class rpki.resource_set.roa_prefix_set_ipv6

Packages

- package rpki.resource_set

Functions

- def rpki::resource_set._bs2long
- def rpki::resource_set._long2bs
- def rpki::resource_set._rsplit
- def rpki::resource_set.test1
- def rpki::resource_set.test2
- def rpki::resource_set.test3
- def rpki::resource_set.testprefix

Variables

- string rpki::resource_set.inherit_token = "<inherit>"

  Token used to indicate inheritance in read and print syntax.

- tuple rpki::resource_set.re_address_range = re.compile("^([0-9:.a-fA-F]+)-([0-9:.a-fA-F]+)$")
- tuple rpki::resource_set.re_asn_range = re.compile("^([0-9]+)-([0-9]+)$")
- tuple rpki::resource_set.re_prefix = re.compile("^([0-9:.a-fA-F]+)/([0-9]+)$")
- tuple rpki::resource_set.re_prefix_with_maxlen = re.compile("^([0-9:.a-fA-F]+)/([0-9]+)-([0-9]+)$")

14.25 roa.py File Reference

Classes

- class rpki.roa.ROAIPAddress
- class rpki.roa.ROAIPAddresses
- class rpki.roa.ROAIPAddressFamilies
- class rpki.roa.ROAIPAddressFamily
- class rpki.roa.RouteOriginAttestation

Packages

- package rpki.roa

14.26 rootd.py File Reference

Classes

- class rpki.rootd.cms_msg
- class rpki.rootd.issue_pdu
- class rpki.rootd.list_pdu
- class rpki.rootd.main
- class rpki.rootd.message_pdu
- class rpki.rootd.revoke_pdu
- class rpki.rootd.sax_handler

Packages

- package rpki.rootd

Variables

- rpki::rootd.rootd = None

14.27 rootd.py File Reference

Packages

- package rootd

14.28 rpkid.py File Reference

Classes

- class rpki.rpkid.ca_detail_obj
- class rpki.rpkid.ca_obj
- class rpki.rpkid.child_cert_obj
- class rpki.rpkid.ghostbuster_obj
- class rpki.rpkid.main
- class rpki.rpkid.publication_queue
- class rpki.rpkid.revoked_cert_obj
- class rpki.rpkid.roa_obj

Packages

- package rpki.rpkid

14.29 rpkid.py File Reference

Packages

- package rpkid

14.30 sql.py File Reference

Classes

- class rpki.sql.session
- class rpki.sql.sql_persistent
- class rpki.sql.template

Packages

- package rpki.sql

14.31 sundial.py File Reference

Classes

- class rpki.sundial.datetime
- class rpki.sundial.timedelta

Packages

- package rpki.sundial

Functions

- def rpki::sundial._cast
- def rpki::sundial.now
- def rpki::sundial.test

14.32 up_down.py File Reference

Classes

- class rpki.up_down.base_elt
- class rpki.up_down.certificate_elt
- class rpki.up_down.class_elt
- class rpki.up_down.class_response_syntax
- class rpki.up_down.cms_msg
- class rpki.up_down.error_response_pdu
- class rpki.up_down.issue_pdu
- class rpki.up_down.issue_response_pdu
- class rpki.up_down.list_pdu
- class rpki.up_down.list_response_pdu
- class rpki.up_down.message_pdu
- class rpki.up_down.multi_uri
- class rpki.up_down.revoke_pdu
- class rpki.up_down.revoke_response_pdu
- class rpki.up_down.revoke_syntax
- class rpki.up_down.sax_handler

Packages

- package rpki.up_down

Variables

- dictionary rpki::up_down.nsmap = { None : xmlns }
- string rpki::up_down.xmlns = "http://www.apnic.net/specs/rescerts/up-down/"

14.33 x509.py File Reference

Classes

- class rpki.x509.CMS_object
- class rpki.x509.CRL
- class rpki.x509.DeadDrop
- class rpki.x509.DER_CMS_object
- class rpki.x509.DER_object
- class rpki.x509.Ghostbuster
- class rpki.x509.Ghostbuster
- class rpki.x509.PEM_converter
- class rpki.x509.PKCS10
- class rpki.x509.ROA
- class rpki.x509.RSA
- class rpki.x509.RSApublic
- class rpki.x509.SignedManifest
- class rpki.x509.X509
- class rpki.x509.XML_CMS_object

Packages

- package rpki.x509

Functions

- def rpki::x509._find_xia_uri
- def rpki::x509.base64_with_linebreaks
- def rpki::x509.calculate_SKI
- def rpki::x509.POWify_OID

14.34 xml_utils.py File Reference

Classes

- class rpki.xml_utils.base_elt
- class rpki.xml_utils.data_elt
- class rpki.xml_utils.msg
- class rpki.xml_utils.sax_handler
- class rpki.xml_utils.text_elt

Packages

- package rpki.xml_utils

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