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**Definitions of Managed Objects for the RPKI-Router Protocol
draft-ymbk-rpki-rtr-protocol-mib-02**

Abstract

This document defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes objects used for monitoring the RPKI Router protocol.

Status of this Memo

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1. Introduction

This document defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it defines objects used for monitoring the RPKI Router protocol [[I-D.ietf-sidr-rpki-rtr](#)].

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

2. Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to [section 7 of RFC3410](#). Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This document specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, [[RFC2578](#)], STD 58, [[RFC2579](#)] and STD 58, [[RFC2580](#)].

3. Overview

The objects defined in this document are used to monitor the RPKI Router protocol [[I-D.ietf-sidr-rpki-rtr](#)]. The MIB module defined in this draft is broken into these tables: the RPKI Router Cache Server (connection) Table, the RPKI Router Cache Server Errors Table, and the RPKI Router Prefix Origin Table.

The RPKI Router Cache Server Table contains information about state and current activity of connections with the RPKI Router Cache Servers. It also contains counters for the number of messages received and sent plus the number of announcements, withdrawals and active records. The RPKI Router Cache Server Errors Table contains counters of occurrences of errors on the connections (if any). The RPKI Router Prefix Origin Table contains IP prefixes with their minimum and maximum prefix lengths and the Origin AS. This data is the collective set of information received from all RPKI Cache Servers that the router is connected with. The Cache Servers are running the RPKI Router protocol.

Two Notification have been defined to inform a Network Management Station (NMS) or operators about changes in the connection state of the connections listed in the RPKI Cache Server (Connection) Table.

4. Definitions

The Following MIB module imports definitions from [RFC2578], STD 58, [RFC2579] STD 58, [RFC2580], [RFC4001], [RFC2287]. That means we have a normative reference to those documents.

The MIB module also has a normative reference to the RPKI Router protocol [I-D.ietf-sidr-rpki-rtr]. Furthermore, for background and informative information, the MIB module refers to [RFC1982], [RFC2385], [RFC4252], [RFC5246], [RFC5925].

```
RPKI-RTR-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,  
    Integer32, Unsigned32, mib-2, Gauge32, Counter32  
        FROM SNMPv2-SMI -- RFC2578
```

```
    InetAddressType, InetAddress, InetPortNumber,  
    InetAddressPrefixLength, InetAutonomousSystemNumber  
        FROM INET-ADDRESS-MIB -- RFC4001
```

```
    TEXTUAL-CONVENTION, TimeStamp  
        FROM SNMPv2-TC -- RFC2579
```

```
    MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP  
        FROM SNMPv2-CONF -- RFC2580
```

```
    LongUtf8String FROM SYSAPPL-MIB -- RFC2287
```

```
;
```

```
rpkiRtrMIB MODULE-IDENTITY  
    LAST-UPDATED "201110140000Z"  
    ORGANIZATION "IETF Secure Inter-Domain Routing (SIDR)  
        Working Group  
    "  
    CONTACT-INFO "Working Group Email: sidr@ietf.org
```

```
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```


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"

DESCRIPTION "This MIB module contains management objects to support monitoring of the Resource Public Key Infrastructure (RPKI) protocol on routers.

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This version of this MIB module is part of RFCxxxx; see the RFC itself for full legal notices.

"

REVISION "201110140000Z"
DESCRIPTION "Initial version, published as RFCxxxx."
-- Note to RFC Editor: pls fill in above (2 times) RFC
-- number for xxxx and delete these 2 lines.
::= { mib-2 XXX } -- XXX to be assigned by IANA

rpkiRtrNotifications OBJECT IDENTIFIER ::= { rpkiRtrMIB 0 }
rpkiRtrObjects OBJECT IDENTIFIER ::= { rpkiRtrMIB 1 }
rpkiRtrConformance OBJECT IDENTIFIER ::= { rpkiRtrMIB 2 }

-- =====
-- Textual Conventions used in this MIB module
-- =====

RpkiRtrConnectionType ::= TEXTUAL-CONVENTION

STATUS current
DESCRIPTION "The connection type or transport security suite
(transport plus security mecahnism) used between
a router (as a client) and a cache server.

The following types have been defined in RFCnnnn:
-- RFC Editor: pls fill out RFCnnnn number that will be or has
-- been assigned to draft-ietf-sidr-rpki-rtr-nn.txt
ssh(1) - sect 7.1, see also RFC4252.
tls(2) - sect 7.2, see also RFC5246.
tcpMD5(3) - sect 7.3, see also RFC2385.
tcpA0(4) - sect 7.4, see also RFC5925.
tcp(5) - sect 7.
ipsec(6) - sect 7, see also RFC4301.
other(7) - non of the above

REFERENCE "The RPKI/Rtr Protocol, RFCnnnn - section 7"
-- RFC Editor: pls fill out RFCnnnn number that will be or has been
-- assigned to draft-ietf-sidr-rpki-rtr-nn.txt

SYNTAX INTEGER {
ssh(1),
tls(2),
tcpMD5(3),
tcpA0(4),
tcp(5),
ipsec(6),
other(7)
}

-- =====
-- Scalar objects
-- =====

rpkiRtrDiscontinuityTimer OBJECT-TYPE


```

SYNTAX      TimeStamp
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION "This timer represents the timestamp (value
            of sysUpTime) at which time any of the
            Counter32 objects in this MIB module
            encountered a discontinuity.

            In principle that should only happen if the
            SNMP agent or the instrumentation for this
            MIB module (re-)starts."
 ::= { rpkIRtrObjects 1 }

```

```

-- =====
-- RPKI Router Cache Server Connection Table
-- =====

```

```

rpkIRtrCacheServerTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF RpkIRtrCacheServerTableEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION "This table lists the RPKI cache servers
                known to this router/system."
    ::= { rpkIRtrObjects 2 }

```

```

rpkIRtrCacheServerTableEntry OBJECT-TYPE
    SYNTAX      RpkIRtrCacheServerTableEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION "An entry in the rpkIRtrCacheServerTable.
                It holds management attributes associated
                with one connection to a RPKI cache server."
    INDEX       { rpkIRtrCacheServerAddressType,
                rpkIRtrCacheServerRemoteAddress,
                rpkIRtrCacheServerRemotePort
                }
    ::= { rpkIRtrCacheServerTable 1 }

```

```

RpkIRtrCacheServerTableEntry ::= SEQUENCE {
    rpkIRtrCacheServerAddressType      InetAddressType,
    rpkIRtrCacheServerRemoteAddress    InetAddress,
    rpkIRtrCacheServerRemotePort       InetPortNumber,
    rpkIRtrCacheServerLocalAddress     InetAddress,
    rpkIRtrCacheServerLocalPort        InetPortNumber,
    rpkIRtrCacheServerPreference       Unsigned32,
    rpkIRtrCacheServerConnectionType   RpkIRtrConnectionType,
    rpkIRtrCacheServerConnectionStatus INTEGER,
    rpkIRtrCacheServerDescription      LongUtf8String,

```



```

rpkiRtrCacheServerMsgsReceived      Counter32,
rpkiRtrCacheServerMsgsSent          Counter32,
rpkiRtrCacheServerV4ActiveRecords   Gauge32,
rpkiRtrCacheServerV4Announcements   Counter32,
rpkiRtrCacheServerV4Withdrawals     Counter32,
rpkiRtrCacheServerV6ActiveRecords   Gauge32,
rpkiRtrCacheServerV6Announcements   Counter32,
rpkiRtrCacheServerV6Withdrawals     Counter32,
rpkiRtrCacheServerLatestSerial      Unsigned32,
rpkiRtrCacheServerNonce             Unsigned32,
rpkiRtrCacheServerRefreshTimer      Unsigned32,
rpkiRtrCacheServerTimeToRefresh     Integer32,
rpkiRtrCacheServerId                Unsigned32
}

```

```

rpkiRtrCacheServerAddressType OBJECT-TYPE
    SYNTAX      InetAddressType { ipv4(1), ipv6 (2) }
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION "The network address type of the connection
                to this RPKI cache server.

                Only IPv4 and IPv6 are supported."
    ::= { rpkiRtrCacheServerTableEntry 1 }

```

```

rpkiRtrCacheServerRemoteAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(4|16))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION "The remote network address for this connection
                to this RPKI cache server.

                The format of the address is defined by the
                value of the corresponding instance of
                rpkiRtrCacheServerAddressType."
    ::= { rpkiRtrCacheServerTableEntry 2 }

```

```

rpkiRtrCacheServerRemotePort OBJECT-TYPE
    SYNTAX      InetPortNumber (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION "The remote port number for this connection
                to this RPKI cache server."
    ::= { rpkiRtrCacheServerTableEntry 3 }

```

```

rpkiRtrCacheServerLocalAddress OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(4|16))
    MAX-ACCESS  read-only

```


STATUS current
 DESCRIPTION "The local network address for this connection to this RPKI cache server.

The format of the address is defined by the value of the corresponding instance of rpkIRtrCacheServerAddressType."

::= { rpkIRtrCacheServerTableEntry 4 }

rpkIRtrCacheServerLocalPort OBJECT-TYPE

SYNTAX InetPortNumber (1..65535)
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION "The local port number for this connection to this RPKI cache server."

::= { rpkIRtrCacheServerTableEntry 5 }

rpkIRtrCacheServerPreference OBJECT-TYPE

SYNTAX Unsigned32 (0..255)
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION "The routers' preference for this RPKI cache server.

A lower value means more preferred. If two entries have the same preference, then the order is arbitrary.

If no order is specified in the configuration then this value is set to 255."

REFERENCE "The RPKI/Rtr Protocol, RFCnnnn - [section 8](#)."

-- RFC-Editor: pls update RFCnnnn with the actual RFC number
 -- assigned to [draft-ietf-sidr-rpki-rtr-nn.txt](#)

::= { rpkIRtrCacheServerTableEntry 6 }

rpkIRtrCacheServerConnectionType OBJECT-TYPE

SYNTAX RpkIRtrConnectionType
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION "The connection type or transport security suite in use for this RPKI cache server."

::= { rpkIRtrCacheServerTableEntry 7 }

rpkIRtrCacheServerConnectionStatus OBJECT-TYPE

SYNTAX INTEGER { up(1), down(2) }
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION "The connection status for this entry

(connection to this RPKI cache server)."
 ::= { rpkiRtrCacheServerTableEntry 8 }

rpkiRtrCacheServerDescription OBJECT-TYPE
 SYNTAX LongUtf8String
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION "Free form description/information for this
 connection to this RPKI cache server."
 ::= { rpkiRtrCacheServerTableEntry 9 }

rpkiRtrCacheServerMsgsReceived OBJECT-TYPE
 SYNTAX Counter32
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION "Number of messages received from this
 RPKI cache server via this connection.

 Discontinuities are indicated by the value
 of rpkiRtrDiscontinuityTimer."
 ::= { rpkiRtrCacheServerTableEntry 10 }

rpkiRtrCacheServerMsgsSent OBJECT-TYPE
 SYNTAX Counter32
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION "Number of messages sent to this
 RPKI cache server via this connection.

 Discontinuities are indicated by the value
 of rpkiRtrDiscontinuityTimer."
 ::= { rpkiRtrCacheServerTableEntry 11 }

rpkiRtrCacheServerV4ActiveRecords OBJECT-TYPE
 SYNTAX Gauge32
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION "Number of active IPv4 records received from
 this RPKI cache server via this connection."
 ::= { rpkiRtrCacheServerTableEntry 12 }

rpkiRtrCacheServerV4Announcements OBJECT-TYPE
 SYNTAX Counter32
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION "The number of IPv4 records announced by the
 RPKI cache Server via this connection."

Discontinuities are indicated by the value
of rpkIRtrDiscontinuityTimer."
::= { rpkIRtrCacheServerTableEntry 13 }

rpkIRtrCacheServerV4Withdrawals OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of IPv4 records withdrawn by the
RPKI cache Server via this connection.

Discontinuities are indicated by the value
of rpkIRtrDiscontinuityTimer."
::= { rpkIRtrCacheServerTableEntry 14 }

rpkIRtrCacheServerV6ActiveRecords OBJECT-TYPE
SYNTAX Gauge32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Number of active IPv6 records received from
this RPKI cache server via this connection."
::= { rpkIRtrCacheServerTableEntry 15 }

rpkIRtrCacheServerV6Announcements OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of IPv6 records announced by the
RPKI cache Server via this connection.

Discontinuities are indicated by the value
of rpkIRtrDiscontinuityTimer."
::= { rpkIRtrCacheServerTableEntry 16 }

rpkIRtrCacheServerV6Withdrawals OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of IPv6 records withdrawn by the
RPKI cache Server via this connection.

Discontinuities are indicated by the value
of rpkIRtrDiscontinuityTimer."
::= { rpkIRtrCacheServerTableEntry 17 }

rpkIRtrCacheServerLatestSerial OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only


```
STATUS current
DESCRIPTION "The latest serial number of data received from
            this RPKI server on this connection.

            Note: this value wraps back to zero when it
            reaches its maximum value."
REFERENCE "RFCnnnn section 2 and RFC1982"
-- RFC-Editor: please fill out nnnn with the RFC number assigned
-- to draft-ietf-sidr-rpki-rtr-nn.txt
 ::= { rpkiRtrCacheServerTableEntry 18 }
```

```
rpkiRtrCacheServerNonce OBJECT-TYPE
SYNTAX Unsigned32 (0..65535)
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The nonce associated with the RPKI cache server
            at the other end of this connection."
REFERENCE "RFCnnnn section 2"
 ::= { rpkiRtrCacheServerTableEntry 19 }
```

```
rpkiRtrCacheServerRefreshTimer OBJECT-TYPE
SYNTAX Unsigned32 (60..7200)
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of seconds configured for the refresh
            timer for this connection to this RPKI cache
            server."
 ::= { rpkiRtrCacheServerTableEntry 20 }
```

```
rpkiRtrCacheServerTimeToRefresh OBJECT-TYPE
SYNTAX Integer32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of seconds remaining before a new
            refresh is performed via a Serial Query to
            this cache server over this connection.
```

A negative value means that the refresh time has passed this many seconds and the refresh has not yet been completed.

Upon a completed refresh (i.e. a successful rnd complete esponse to a Serial Query) the value of this attribute will be re-initialized with the value of the corresponding rpkiRtrCacheServerRefreshTimer attribute."


```
 ::= { rpkIRtrCacheServerTableEntry 21 }
```

rpkIRtrCacheServerId OBJECT-TYPE

```
SYNTAX      Unsigned32 (1..4294967295)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION "The unique ID for this connection.
```

```

        An implementation must make sure this ID is unique
        within this table. It is this ID that can be used
        to find entries in the rpkIRtrPrefixOriginTable
        that were created by announcements received on this
        connection from this cache server."
```

```
 ::= { rpkIRtrCacheServerTableEntry 22 }
```

```
-- =====
-- Errors Table
-- =====
```

rpkIRtrCacheServerErrorsTable OBJECT-TYPE

```
SYNTAX      SEQUENCE OF RpkIRtrCacheServerErrorsTableEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION "This table provides statistics on errors per
            RPKI peer connection. These can be used for
            debugging."
 ::= { rpkIRtrObjects 3 }
```

rpkIRtrCacheServerErrorsTableEntry OBJECT-TYPE

```
SYNTAX      RpkIRtrCacheServerErrorsTableEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION "An entry in the rpkIRtrCacheServerErrorTable. It holds
            management objects associated with errors that
            were detected for the specified connection to
            a specific cache server."
AUGMENTS    { rpkIRtrCacheServerTableEntry }
 ::= { rpkIRtrCacheServerErrorsTable 1 }
```

RpkIRtrCacheServerErrorsTableEntry ::= SEQUENCE {

```
  rpkIRtrCacheServerErrorsCorruptData      Counter32,
  rpkIRtrCacheServerErrorsInternalError    Counter32,
  rpkIRtrCacheServerErrorsNoData          Counter32,
  rpkIRtrCacheServerErrorsInvalidRequest   Counter32,
  rpkIRtrCacheServerErrorsUnsupportedVersion Counter32,
  rpkIRtrCacheServerErrorsUnsupportedPdu   Counter32,
  rpkIRtrCacheServerErrorsWithdrawalUnknown Counter32,
  rpkIRtrCacheServerErrorsDuplicateAnnounce Counter32
```


}

rpkiRtrCacheServerErrorsCorruptData OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of 'Corrupt Data' errors received from the RPKI cache server at the other end of this connection.

Discontinuities are indicated by the value of rpkiRtrDiscontinuityTimer."

::= { rpkiRtrCacheServerErrorsTableEntry 1 }

rpkiRtrCacheServerErrorsInternalError OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of 'Internal Error' errors received from the RPKI cache server at the other end of this connection.

Discontinuities are indicated by the value of rpkiRtrDiscontinuityTimer."

::= { rpkiRtrCacheServerErrorsTableEntry 2 }

rpkiRtrCacheServerErrorsNoData OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of 'No Data Available' errors received from the RPKI cache server at the other end of this connection.

Discontinuities are indicated by the value of rpkiRtrDiscontinuityTimer."

::= { rpkiRtrCacheServerErrorsTableEntry 3 }

rpkiRtrCacheServerErrorsInvalidRequest OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of 'Invalid Request' errors received from the RPKI cache server at the other end of this connection.

Discontinuities are indicated by the value of rpkiRtrDiscontinuityTimer."

::= { rpkIRtrCacheServerErrorsTableEntry 4 }

rpkIRtrCacheServerErrorsUnsupportedVersion OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION "The number of 'Unsupported Protocol Version' errors received from the RPKI cache server at the other end of this connection.

Discontinuities are indicated by the value of rpkIRtrDiscontinuityTimer."

::= { rpkIRtrCacheServerErrorsTableEntry 5 }

rpkIRtrCacheServerErrorsUnsupportedPdu OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION "The number of 'Unsupported PDU Type' errors received from the RPKI cache server at the other end of this connection.

Discontinuities are indicated by the value of rpkIRtrDiscontinuityTimer."

::= { rpkIRtrCacheServerErrorsTableEntry 6 }

rpkIRtrCacheServerErrorsWithdrawalUnknown OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION "The number of 'Withdrawal of Unknown Record' errors received from the RPKI cache server at the other end of this connection.

Discontinuities are indicated by the value of rpkIRtrDiscontinuityTimer."

::= { rpkIRtrCacheServerErrorsTableEntry 7 }

rpkIRtrCacheServerErrorsDuplicateAnnounce OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION "The number of 'Duplicate Announcement Received' errors received from the RPKI cache server at the other end of this connection.

Discontinuities are indicated by the value of rpkIRtrDiscontinuityTimer."


```
 ::= { rpkIRtrCacheServerErrorsTableEntry 8 }
```

```
-- =====
-- The rpkIRtrPrefixOriginTable (was referred to as ROATable in an
-- earlier version of this table)
-- =====
```

```
rpkIRtrPrefixOriginTable OBJECT-TYPE
```

```
SYNTAX      SEQUENCE OF RpkIRtrPrefixOriginTableEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION "This table lists the prefixes that were
             announced by RPKI cache servers to this system.
             That is the prefixes and their Origin ASN
             as recieved by announcements via the
             rpkI-rtr protocol."
 ::= { rpkIRtrObjects 4 }
```

```
rpkIRtrPrefixOriginTableEntry OBJECT-TYPE
```

```
SYNTAX      RpkIRtrPrefixOriginTableEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION "An entry in the rpkIRtrPrefixOriginTable.
             This represents one announced prefix."
INDEX       { rpkIRtrPrefixOriginAddressType,
              rpkIRtrPrefixOriginAddress,
              rpkIRtrPrefixOriginMinLength
            }
 ::= { rpkIRtrPrefixOriginTable 1 }
```

```
RpkIRtrPrefixOriginTableEntry ::= SEQUENCE {
```

```
  rpkIRtrPrefixOriginAddressType  InetAddressType,
  rpkIRtrPrefixOriginAddress       InetAddress,
  rpkIRtrPrefixOriginMinLength     InetAddressPrefixLength,
  rpkIRtrPrefixOriginMaxLength    InetAddressPrefixLength,
  rpkIRtrPrefixOriginASN           InetAutonomousSystemNumber,
  rpkIRtrPrefixOriginCacheServerId Unsigned32
}
```

```
rpkIRtrPrefixOriginAddressType OBJECT-TYPE
```

```
SYNTAX      InetAddressType { ipv4(1), ipv6(2) }
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION "The network Address Type for this prefix.

             Only IPv4 and IPv6 are supported."
 ::= { rpkIRtrPrefixOriginTableEntry 1 }
```


rpkiRtrPrefixOriginAddress OBJECT-TYPE
SYNTAX InetAddress (SIZE(4|16))
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The network Address for this prefix.

The format of the address is defined by the
value of the corresponding instance of
rpkiRtrCacheServerAddressType."

::= { rpkiRtrPrefixOriginTableEntry 2 }

rpkiRtrPrefixOriginMinLength OBJECT-TYPE
SYNTAX InetAddressPrefixLength
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The minimum prefix length allowed for this prefix."

::= { rpkiRtrPrefixOriginTableEntry 3 }

rpkiRtrPrefixOriginMaxLength OBJECT-TYPE
SYNTAX InetAddressPrefixLength
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The maximum prefix length allowed for this prefix.

Note, this value must be greater or equal to the
value of rpkiRtrPrefixOriginMinLength."

::= { rpkiRtrPrefixOriginTableEntry 4 }

rpkiRtrPrefixOriginASN OBJECT-TYPE
SYNTAX InetAutonomousSystemNumber
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The ASN that is authorized to announce the
prefix or sub-prefixes covered by this entry."

::= { rpkiRtrPrefixOriginTableEntry 5 }

rpkiRtrPrefixOriginCacheServerId OBJECT-TYPE
SYNTAX Unsigned32 (1..4294967295)
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The unique ID of the connection to the cache
server from which this announcement was received.
That connection is identified/found by a matching
value in attribute rpkiRtrCacheServerId."

::= { rpkiRtrPrefixOriginTableEntry 6 }

-- =====
-- Notifications

-- =====

```

rpkiRtrCacheServerConnectionStateChange NOTIFICATION-TYPE
  OBJECTS      { rpkiRtrCacheServerConnectionStatus,
                  rpkiRtrCacheServerLatestSerial,
                  rpkiRtrCacheServerNonce
                }
  STATUS       current
  DESCRIPTION  "This notification signals a change in the status
                of an rpkiRtrCacheServerConnection.

                The SNMP agent MUST throttle the generation of
                consecutive rpkiRtrCacheServerConnectionStateChange
                notifications such that there is at least a
                5 second gap between them.
                "
  ::= { rpkiRtrNotifications 1 }

```

```

rpkiRtrCacheServerConnectionToGoStale NOTIFICATION-TYPE
  OBJECTS      { rpkiRtrCacheServerV4ActiveRecords,
                  rpkiRtrCacheServerV6ActiveRecords,
                  rpkiRtrCacheServerLatestSerial,
                  rpkiRtrCacheServerNonce,
                  rpkiRtrCacheServerRefreshTimer,
                  rpkiRtrCacheServerTimeToRefresh
                }
  STATUS       current
  DESCRIPTION  "This notification signals that an RPKI cache
                server connection is about to go stale.
                It is suggested that this notification is
                generated when the value of the
                rpkiRtrCacheServerTimeToRefresh attribute
                goes below 60 seconds.

                The SNMP agent MUST throttle the generation of
                consecutive rpkiRtrCacheServerConnectionToGoStale
                notifications such that there is at least a
                5 second gap between them.
                "
  ::= { rpkiRtrNotifications 2 }

```

-- =====
-- Module Compliance information
-- =====

```

rpkiRtrCompliances OBJECT IDENTIFIER ::=
                                     {rpkiRtrConformance 1}
rpkiRtrGroups      OBJECT IDENTIFIER ::=

```


{rpkIRtrConformance 2}

rpkIRtrReadOnlyCompliance MODULE-COMPLIANCE

```

STATUS      current
DESCRIPTION "The compliance statement for the rpkIRtrMIB
            module. There are only read-only objects in this
            MIB module, so the 'ReadOnly' in the name of this
            compliance statement is there only for clarity
            and truth in advertising.
            "
MODULE      -- This module
MANDATORY-GROUPS { rpkIRtrCacheServerGroup,
                   rpkIRtrPrefixOriginGroup,
                   rpkIRtrNotificationsGroup
                   }
GROUP       rpkIRtrCacheServerErrorsGroup
DESCRIPTION "Implementation of this group is optional and
            would be useful for debugging."
 ::= { rpkIRtrCompliances 1 }

```

rpkIRtrCacheServerGroup OBJECT-GROUP

```

OBJECTS     { rpkIRtrDiscontinuityTimer,
              rpkIRtrCacheServerLocalAddress,
              rpkIRtrCacheServerLocalPort,
              rpkIRtrCacheServerPreference,
              rpkIRtrCacheServerConnectionType,
              rpkIRtrCacheServerConnectionStatus,
              rpkIRtrCacheServerDescription,
              rpkIRtrCacheServerMsgsReceived,
              rpkIRtrCacheServerMsgsSent,
              rpkIRtrCacheServerV4ActiveRecords,
              rpkIRtrCacheServerV4Announcements,
              rpkIRtrCacheServerV4Withdrawals,
              rpkIRtrCacheServerV6ActiveRecords,
              rpkIRtrCacheServerV6Announcements,
              rpkIRtrCacheServerV6Withdrawals,
              rpkIRtrCacheServerLatestSerial,
              rpkIRtrCacheServerNonce,
              rpkIRtrCacheServerRefreshTimer,
              rpkIRtrCacheServerTimeToRefresh,
              rpkIRtrCacheServerId
            }
STATUS      current
DESCRIPTION "The collection of objects to monitor the RPKI peer
            connections."
 ::= { rpkIRtrGroups 1 }

```

rpkIRtrCacheServerErrorsGroup OBJECT-GROUP


```

OBJECTS      { rpkIRtrCacheServerErrorsCorruptData,
               rpkIRtrCacheServerErrorsInternalError,
               rpkIRtrCacheServerErrorsNoData,
               rpkIRtrCacheServerErrorsInvalidRequest,
               rpkIRtrCacheServerErrorsUnsupportedVersion,
               rpkIRtrCacheServerErrorsUnsupportedPdu,
               rpkIRtrCacheServerErrorsWithdrawalUnknown,
               rpkIRtrCacheServerErrorsDuplicateAnnounce
             }
STATUS      current
DESCRIPTION "The collection of objects that may help in
           debugging the communication between rпки
           clients and cache servers."
 ::= { rpkIRtrGroups 2 }

rpkIRtrPrefixOriginGroup OBJECT-GROUP
OBJECTS      { rpkIRtrPrefixOriginMaxLength,
               rpkIRtrPrefixOriginASN,
               rpkIRtrPrefixOriginCacheServerId
             }
STATUS      current
DESCRIPTION "The collection of objects that represent
           the prefix(es) and their validated origin
           ASes."
 ::= { rpkIRtrGroups 3 }

rpkIRtrNotificationsGroup NOTIFICATION-GROUP
NOTIFICATIONS { rpkIRtrCacheServerConnectionStateChange,
               rpkIRtrCacheServerConnectionToGoStale
             }
STATUS      current
DESCRIPTION "The set of notifications to alert an NMS of change
           in connections to RPKI cache servers."
 ::= { rpkIRtrGroups 4 }

END

```

5. IANA Considerations

The MIB module in this document will required an IANA assigned OBJECT IDENTIFIER within the SMI Numbers registry. For example, replacing XXX below:

Descriptor	OBJECT IDENTIFIER value
-----	-----

rpkiRouter { mib-2 XXX }

6. Security Considerations

There are no management objects defined in this MIB module that have a MAX-ACCESS clause of read-write and/or read-create. So, if this MIB module is implemented correctly, then there is no risk that an intruder can alter or create any management objects of this MIB module via direct SNMP SET operations.

Most of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. They are vulnerable in the sense that when an intruder sees the information in this MIB module, then it might help him/her to setup a an attack on the router or cache server. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPsec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

7. References

7.1. Normative References

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