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.

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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 RoOuter 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 notifications 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
Randy Bush"
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.
tcpAO(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
-- assigned to draft-ietf-sidr-rpki-rtr-nn.txt

SYNTAX       INTEGER {
   ssh(1),
tls(2),
tcpMD5(3),
tcpAO(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."
 ::= { rpkiRtrCacheServerTable 1 }

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
rpkiRtrCacheServerMsgsSent
rpkiRtrCacheServerV4ActiveRecords
rpkiRtrCacheServerV4Announcements
rpkiRtrCacheServerV4Withdrawals
rpkiRtrCacheServerV6ActiveRecords
rpkiRtrCacheServerV6Announcements
rpkiRtrCacheServerV6Withdrawals
rpkiRtrCacheServerLatestSerial
rpkiRtrCacheServerNonce
rpkiRtrCacheServerRefreshTimer
rpkiRtrCacheServerTimeToRefresh
rpkiRtrCacheServerId

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
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"
::= { 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
```
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 }

The nonce associated with the RPKI cache server at the other end of this connection.

REFERENCE "RFCnnnn section 2"
::= { rpkiRtrCacheServerTableEntry 19 }

The number of seconds configured for the refresh timer for this connection to this RPKI cache server.

::= { rpkiRtrCacheServerTableEntry 20 }

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 response 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 rpkiCacheServerErrorTable. 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 received 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 ::=  

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
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:

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>OBJECT IDENTIFIER value</th>
</tr>
</thead>
</table>

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

[I-D.ietf-sidr-rpki-rtr]
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7.2. Informative References


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