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Definitions of Managed Objects for RObust Header Compression (ROHC)

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes a set of managed objects that allow monitoring of running instances of RObust Header Compression (ROHC). The managed objects defined in this memo are grouped into three MIB modules. The ROHC-MIB module defines managed objects shared by all ROHC profiles, the ROHC-UNCOMPRESSED-MIB module defines managed objects specific to the ROHC uncompressed profile, the ROHC-RTP-MIB module defines managed objects specific to the ROHC RTP (Real-Time Transport Protocol) profile, the ROHC UDP (User Datagram Protocol) profile, the ROHC ESP (Encapsulating Security Payload) profile, and the ROHC LLA (Link Layer Assisted) profile.

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## 1. Introduction

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes a set of managed objects that allow monitoring of running instances of robust header compression.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, RFC 2119 [RFC2119].

## 2. The 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 RFC 3410 [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 memo specifies a MIB

module that is compliant to the SMIV2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

### 3. Overview

This section describes the basic model of RObust Header Compression (ROHC, [RFC3095]) used when developing the MIB modules for ROHC described in the following sections.

ROHC presents a framework for IP header compression that allows flexible adjustment of compression efficiency versus robustness against channel errors depending on the underlying channel characteristics.

ROHC introduces header compressors/decompressors at the end-points (interfaces) of (wireless) channels on which packets with compressed headers are transferred. ROHC exploits the temporal redundancy in successive packet headers of a packet flow by storing non-changing fields of the headers as well as reference values of predictably changing fields as context information. When the context information for a packet flow is also established at the decompressor, only delta-information and unpredictably changing header fields have to be sent over the channel.

This document specifies MIB modules in order to provide a means for managing ROHC implementations via SNMP and within the IETF management framework. The objects defined support configuration management, fault management and performance monitoring.

For configuration management implementation parameters (see Section 6.3 of [RFC3095]) and configuration parameters (including the ones specified in Section 5.1.1 of [RFC3095] and in Section 5.1.1 of [RFC3242]) can be verified by using the MIB modules specified below.

For fault management compressor/decompressor state and mode can be checked.

For performance management a set of statistics is provided including the number of flows that have used ROHC, the current and long term compression ratio, the number of reinitializations and the number of packets sent or received with different header types.

### 4. Structure of the MIB modules

This section presents the structure of the MIB modules that are specified in Section 5. Basically, the MIB is structured according to the ROHC architecture described in [RFC3759].

ROHC is an evolving technology. [RFC3095] specifies the header compression framework and four profiles: uncompressed, RTP, UDP, and ESP (Real-Time Transport Protocol, User Datagram Protocol, Encapsulating Security Payload). [RFC3242] specifies a profile with additional link layer assistance called LLA (Link Layer Assisted). A profile for compression of TCP (Transmission Control Protocol) flows is under development within the ROHC working group and SCTP (Stream Control Transmission Protocol) compression is being discussed as potential next candidate. Therefore, the managed objects defined below are structured into three MIB modules: the general ROHC-MIB module and the profile-specific ROHC-UNCOMPRESSED-MIB and ROHC-RTP-MIB modules. This flexible approach allows to support future profiles each by its own profile-specific module.

The ROHC-MIB module defines properties of information on ROHC instances, ROHC channels, ROHC profiles, and ROHC compressor and decompressor contexts. All managed objects in this module are assumed to be shared by all profiles.

The ROHC-UNCOMPRESSED-MIB module extends the ROHC-MIB by managed objects that are specific to the ROHC uncompressed profile 0x0000 defined in [RFC3095]. The ROHC-RTP-MIB module extends the ROHC-MIB by managed objects that are specific to the three profiles defined in [RFC3095] (ROHC RTP profile 0x0001, ROHC UDP profile 0x0002, and ROHC ESP profile 0x0003), and to the ROHC LLA profile 0x0005 defined in [RFC3242]. An analysis of these profiles showed that they are tightly related and can share most of the managed objects in the ROHC-UNCOMPRESSED-MIB module. Therefore, a joint module for all of them was preferred to individual modules.

The number of managed objects in the ROHC-UNCOMPRESSED-MIB Module and the ROHC-RTP-MIB Module is rather small. They contain context state and context mode, and profile-specific context statistics. It is assumed that MIB modules for future profiles, such as TCP and SCTP, will be similarly small and easy to design.

#### 4.1. The ROHC-MIB module

The ROHC-MIB module defines managed objects that are expected to be useful for all current and future ROHC profiles. Objects in the ROHC-MIB module are arranged into four tables: the rohcChannelTable, the rohcInstanceTable, the rohcProfileTable, and the rohcContextTable. The managed objects in the first three tables are rather static (except for provided statistics), while the objects in the rohcContextTable are more dynamic.

All tables are indexed by the IP interface number and by a numeric channel identifier. The channel identifier is used for channels to which compressors and decompressors are attached (called ROHC channels in [RFC3759]), as well as for dedicated feedback channels (called ROHC feedback channels in [RFC3759]). Compressor and decompressor instances are further indexed by their type (either compressor or decompressor). Contexts are indexed by the same index as their corresponding instance and their individual context identifier (CID).

#### 4.1.1. rohcChannelTable

The rohcChannelTable lists all channels used by ROHC instances for transferring compressed packets and/or for giving feedback from the decompressor to the compressor. Listed channels are either ROHC channels or feedback channels as defined in [RFC3759]. The channels are listed per IP interface.

The information per channel in the rohcChannelTable includes

- o the channel ID,
- o the channel type, either 'notInUse', 'rohc', or 'dedicatedFeedback',
- o the channel for which feedback is provided by this channel (if applicable),
- o a string for describing the channel, and
- o the status of the channel being either 'enabled' or 'disabled'.

#### 4.1.2. rohcInstanceTable

The rohcInstanceTable defines properties of ROHC compressor instances and ROHC decompressor instances.

As described in [RFC3759], an instance is associated with exactly one channel and only one instance can be associated with the same channel. Therefore, the same index consisting of ifIndex and rohcChannelID could have been used for both tables. But when accessing the rohcInstanceTable (and the rohcContextTable that shares a part of its index with the rohcInstanceTable) there are many cases where either a compressor contexts or a decompressor contexts are of interest. Therefore, the rohcInstanceType indicating either a compressor or a decompressor was added to the table's index. This allows listing all compressors without accessing any decompressor.

Note that still the combination of ifIndex and rohcChannelID uniquely identifies an instance. It is always possible to directly identify and access the channel corresponding to a given instance.

The set of instance properties in the rohcInstanceTable includes

- o the vendor of the implementation, version number and description,
- o the channels used for compressed packets and for feedback,
- o implementation and configuration properties including clock resolution, maximum context identifier number (MAX\_CID), the LARGE\_CIDS flag, and the Maximum Reconstructed Reception Unit (MRRU),
- o the storage time for contexts created by this instance,
- o the status of the instance (operational or not).

Optionally, the rohcInstanceTable also contains instance statistics including

- o the total number of compressed flows,
- o the current number of compressed flows,
- o the total number of packets passing this instance
- o the total number of static Initialization and Refreshes (IRs) passing this instance
- o the total number of dynamic Initialization and Refreshes (IR-DYNS) passing this instance, and
- o the total compression ratio achieved on the channel.

Instances are listed per IP interface.

#### 4.1.3. rohcProfileTable

The rohcProfileTable lists available profiles per instance including information on

- o the profile number,
- o the vendor and version number, and
- o a string describing the profile.

- o a flag indicating whether or not using this profile has been negotiated with the corresponding (de)compressor.

#### 4.1.4. rohcContextTable

The rohcContextTable lists compressor contexts or decompressor contexts per instance and context identifier (CID). Each row of this table represents a context. If a new context is created, also a new row in this table is created. After expiration or termination of a context, the row will continue to exist until the context's storage time expires or until the CID is re-used. Then the row will be deleted.

For each context, the following attributes are listed:

- o the type of context ('compressor' or 'decompressor'), also used as part of the table index,
- o the CID,
- o the state of the CID ('unused', 'active', 'expired', or 'terminated'), also used as part of the table index,
- o the used profile,
- o in case of a decompressor: the decompressor depth, and
- o the storage time.

Optionally, context statistics is provided including

- o activation and deactivation time of the context,
- o the number of packets sent or received, respectively,
- o the numbers of IRs and IR-DYNs sent or received, respectively,
- o the number of feedbacks sent or received, respectively,
- o in case of a decompressor context: the numbers of decompressor failures and repairs,
- o the total compression ratio of all packets passing this context,
- o the total compression ratio of all packet headers compressed in this context,

- o the mean compressed packet size of all packets passing this context,
- o the mean header size of all compressed headers passing this context,
- o the compression ratio of the last 16 packets passing this context,
- o the compression ratio of the last 16 packet headers compressed in this context,
- o the mean compressed packet size of the last 16 packets passing this context,
- o the mean header size of the last 16 compressed headers passing this context.

#### 4.2. The ROHC-UNCOMPRESSED-MIB module

The ROHC-UNCOMPRESSED-MIB module defines managed objects that are specific to ROHC uncompressed profile (0x0000) specified in [RFC3095].

##### 4.2.1. rohcUncmprContextTable

The rohcUncmprContextTable extends the rohcContextTable. It provides information on state and mode of the compressor for profile 0x0000. Optionally, it also provides a counter of ACK feedbacks sent or received by the context, respectively.

#### 4.3. The ROHC-RTP-MIB module

The ROHC-RTP-MIB module defines managed objects that are specific to three profiles specified in [RFC3095] (ROHC RTP profile 0x0001, ROHC UDP profile 0x0002, and ROHC ESP profile 0x0003) and to the ROHC LLA profile 0x0005 specified in [RFC3242]. The ROHC-RTP-MIB contains two tables, the rohcRtpContextTable and the rohcRtpPacketSizeTable.

##### 4.3.1. rohcRtpContextTable

The rohcRtpContextTable extends the rohcContextTable. It provides information on context state and context mode for profiles 0x0001 - 0x0003 and 0x0005. For compressor contexts it optionally contains managed object containing the numbers of allowed and used packet sizes. As further option, counters of the numbers of ACKs, NACKs, and SNACKs in this context are specified.



## 4.3.2. rohcPacketSizeTable

The optional rohcPacketSizeTable lists per compressor context the allowed packet sizes for profiles ROHC RTP, ROHC UDP, ROHC ESP, or the preferred packet sizes for ROHC LLA, respectively. Allowed packet sizes are marked if they are used. For preferred packet sizes, it is indicated whether the preferred size applies to NHP only, to RHP only or to all packets.

## 5. Definitions

```
ROHC-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY, OBJECT-TYPE,  
    Unsigned32, Counter32, mib-2  
    FROM SNMPv2-SMI -- [RFC2578]
```

```
    TEXTUAL-CONVENTION, TruthValue,  
    TimeInterval, DateAndTime  
    FROM SNMPv2-TC -- [RFC2579]
```

```
    MODULE-COMPLIANCE, OBJECT-GROUP  
    FROM SNMPv2-CONF -- [RFC2580]
```

```
    SnmpAdminString  
    FROM SNMP-FRAMEWORK-MIB -- [RFC3411]
```

```
    ifIndex  
    FROM IF-MIB; -- [RFC2863]
```

```
rohcMIB MODULE-IDENTITY
```

```
    LAST-UPDATED "200406030000Z" -- June 3, 2004  
    ORGANIZATION "IETF Robust Header Compression Working Group"  
    CONTACT-INFO
```

```
        "WG charter:  
        http://www.ietf.org/html.charters/rohc-charter.html
```

```
    Mailing Lists:
```

```
        General Discussion: rohc@ietf.org  
        To Subscribe: rohc-request@ietf.org  
        In Body: subscribe your_email_address
```

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## DESCRIPTION

"This MIB module defines a set of basic objects for monitoring and configuring robust header compression. The module covers information about running instances of ROHC (compressors or decompressors) at IP interfaces.

Information about compressor contexts and decompressor contexts has different structure for different profiles. Therefore it is not provided by this MIB module, but by individual modules for different profiles.

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<http://www.ietf.org/copyrights/ianamib.html>"

REVISION "200406030000Z" -- June 3, 2004  
DESCRIPTION "Initial version, published as RFC 3816."  
 ::= { mib-2 112 }

RohcChannelIdentifier ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"A number identifying a channel.  
The value of 0 must not be used as identifier of an existing channel."

SYNTAX Unsigned32 (1..4294967295)

RohcChannelIdentifierOrZero ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"A number identifying a channel.  
The value of 0 is indicates that no channel is identified."

SYNTAX Unsigned32 (0..4294967295)

RohcCompressionRatio ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"A number indicating a compression ratio over

a set of bytes. The value is defined as  
1000 \* bytes(compressed) / bytes(original)  
rounded to the next integer value.

Note that compressed sets of bytes can be larger  
than the corresponding uncompressed ones.

Therefore, the number can be greater than 1000."

SYNTAX Unsigned32

--

-- The groups defined within this MIB module:

--

rohObjects OBJECT IDENTIFIER ::= { rohMIB 1 }

rohConformance OBJECT IDENTIFIER ::= { rohMIB 2 }

--

-- The ROHC Instance group lists properties of ROHC  
-- instances in the rohInstanceTable, about the channels used  
-- by the instances in the rohChannelTable and about the profiles  
-- available at the instances in the rohProfileTable.

--

rohInstanceObjects OBJECT IDENTIFIER ::= { rohObjects 1 }

--

-- Channel Table

--

-- Listing all channels used for ROHC data channel  
-- and/or as feedback channel.

--

rohChannelTable OBJECT-TYPE

SYNTAX SEQUENCE OF RohChannelEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table lists and describes all ROHC channels  
per interface."

::= { rohInstanceObjects 1 }

rohChannelEntry OBJECT-TYPE

SYNTAX RohChannelEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry describing a particular script. Every script that  
is stored in non-volatile memory is required to appear in

this script table.

Note, that the rohcChannelID identifies the channel uniquely. The ifIndex is part of the index of this table just in order to allow addressing channels per interface."

```
INDEX { ifIndex, rohcChannelID }
 ::= { rohcChannelTable 1 }
```

```
RohcChannelEntry ::= SEQUENCE {
    rohcChannelID      RohcChannelIdentifier,
    rohcChannelType    INTEGER,
    rohcChannelFeedbackFor RohcChannelIdentifierOrZero,
    rohcChannelDescr   SnmpAdminString,
    rohcChannelStatus  INTEGER
}
```

rohcChannelID OBJECT-TYPE

```
SYNTAX      RohcChannelIdentifier
MAX-ACCESS  not-accessible
STATUS      current
```

DESCRIPTION

"The locally arbitrary, but unique identifier associated with this channel. The value is REQUIRED to be unique per ROHC MIB implementation independent of the associated interface.

The value is REQUIRED to remain constant at least from one re-initialization of the entity's network management system to the next re-initialization. It is RECOMMENDED that the value persist across such re-initializations."

REFERENCE

"RFC 3095, Section 5.1.1"

```
::= { rohcChannelEntry 2 }
```

rohcChannelType OBJECT-TYPE

```
SYNTAX      INTEGER {
                notInUse(1),
                rohc(2),
                dedicatedFeedback(3)
            }
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

DESCRIPTION

"Type of usage of the channel. A channel might be currently not in use for ROHC or feedback, it might be in use as a ROHC channel carrying packets and optional piggy-backed feedback, or it might be used as a dedicated feedback channel exclusively carrying feedback."

```

 ::= { rohcChannelEntry 3 }

rohcChannelFeedbackFor OBJECT-TYPE
    SYNTAX      RohcChannelIdentifierOrZero
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The index of another channel of this interface for which
         the channel serves as feedback channel.

         If no feedback information is transferred on this channel,
         then the value of this ID is 0.  If the channel type is set
         to notInUse(1), then the value of this object must be 0.
         If the channel type is rohc(2) and the value of this object
         is a valid channel ID, then feedback information is
         piggy-backed on the ROHC channel.  If the channel type is
         dedicatedFeedback(3), then feedback is transferred on this
         channel and the value of this object MUST be different from
         0 and MUST identify an existing ROHC channel."
    REFERENCE
        "RFC 3095, Section 5.1.1"
 ::= { rohcChannelEntry 4 }

rohcChannelDescr OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A textual description of the channel."
 ::= { rohcChannelEntry 5 }

rohcChannelStatus OBJECT-TYPE
    SYNTAX      INTEGER {
                    enabled(1),
                    disabled(2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Status of the channel."
 ::= { rohcChannelEntry 6 }

--
-- Instances of ROHC
--
-- This table lists properties of running instances of ROHC
-- compressors and decompressors at the managed node.
--

```

```

rohInstanceTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF RohInstanceEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table lists properties of running instances
        of robust header compressors and decompressors
        at IP interfaces. It is indexed by interface number,
        the type of instance (compressor or decompressor),
        and the ID of the channel used by the instance as
        ROHC channel.

        Note that the rohChannelID uniquely identifies an
        instance. The ifIndex and rohInstanceType are part
        of the index, because it simplifies accessing instances
        per interface and for addressing either compressors or
        decompressors only."
    ::= { rohInstanceObjects 2 }

rohInstanceEntry OBJECT-TYPE
    SYNTAX      RohInstanceEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry describing a particular instance
        of a robust header compressor or decompressor."
    INDEX { ifIndex, rohInstanceType, rohChannelID }
    ::= { rohInstanceTable 1 }

RohInstanceEntry ::= SEQUENCE {
    rohInstanceType          INTEGER,
    rohInstanceFBChannelID   RohChannelIdentifierOrZero,
    rohInstanceVendor        OBJECT IDENTIFIER,
    rohInstanceVersion       SnmpAdminString,
    rohInstanceDescr         SnmpAdminString,
    rohInstanceClockRes      Unsigned32,
    rohInstanceMaxCID        Unsigned32,
    rohInstanceLargeCIDs     TruthValue,
    rohInstanceMRRU          Unsigned32,
    rohInstanceContextStorageTime TimeInterval,
    rohInstanceStatus        INTEGER,
    rohInstanceContextsTotal Counter32,
    rohInstanceContextsCurrent Unsigned32,
    rohInstancePackets       Counter32,
    rohInstanceIRs           Counter32,
    rohInstanceIRDYNs        Counter32,
    rohInstanceFeedbacks     Counter32,

```

```

    rohcInstanceCompressionRatio    RohcCompressionRatio
}

rohcInstanceType OBJECT-TYPE
    SYNTAX      INTEGER {
                    compressor(1),
                    decompressor(2)
                }
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Type of the instance of ROHC. It is either a
         compressor instance or a decompressor instance."
    ::= { rohcInstanceEntry 2 }

rohcInstanceFBChannelID OBJECT-TYPE
    SYNTAX      RohcChannelIdentifierOrZero
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Identifier of the channel used for feedback.
         If no feedback channel is used, the value of
         this object is 0 ."
    REFERENCE
        "RFC 3095, Section 5.1.1"
    ::= { rohcInstanceEntry 4 }

rohcInstanceVendor OBJECT-TYPE
    SYNTAX      OBJECT IDENTIFIER
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "An object identifier that identifies the vendor who
         provides the implementation of robust header description.
         This object identifier SHALL point to the object identifier
         directly below the enterprise object identifier
         {1 3 6 1 4 1} allocated for the vendor. The value must be
         the object identifier {0 0} if the vendor is not known."
    ::= { rohcInstanceEntry 5 }

rohcInstanceVersion OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE (0..32))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The version number of the implementation of robust header
         compression. The zero-length string shall be used if the
         implementation does not have a version number."

```

It is suggested that the version number consist of one or more decimal numbers separated by dots, where the first number is called the major version number."

```
::= { rohcInstanceEntry 6 }
```

rohcInstanceDescr OBJECT-TYPE  
SYNTAX SnmpAdminString  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"A textual description of the implementation."  
::= { rohcInstanceEntry 7 }

rohcInstanceClockRes OBJECT-TYPE  
SYNTAX Unsigned32  
UNITS "milliseconds"  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"This object indicates the system clock resolution in units of milliseconds. A zero (0) value means that there is no clock available."  
::= { rohcInstanceEntry 8 }

rohcInstanceMaxCID OBJECT-TYPE  
SYNTAX Unsigned32 (1..16383)  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"The highest context ID number to be used by the compressor. Note that this parameter is not coupled to, but in effect further constrained by, rohcChannelLargeCIDs."  
REFERENCE  
"RFC 3095, Section 5.1.1"  
::= { rohcInstanceEntry 9 }

rohcInstanceLargeCIDs OBJECT-TYPE  
SYNTAX TruthValue  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"When retrieved, this boolean object returns false if the short CID representation (0 bytes or 1 prefix byte, covering CID 0 to 15) is used; it returns true, if the embedded CID representation (1 or 2 embedded CID bytes covering CID 0 to 16383) is used."



## REFERENCE

"RFC 3095, Section 5.1.1"  
 ::= { rohcInstanceEntry 10 }

## rohcInstanceMRRU OBJECT-TYPE

SYNTAX Unsigned32  
 MAX-ACCESS read-only  
 STATUS current

## DESCRIPTION

"Maximum reconstructed reception unit. This is the size of the largest reconstructed unit in octets that the decompressor is expected to reassemble from segments (see RFC 3095, Section 5.2.5). Note that this size includes the CRC. If MRRU is negotiated to be 0, no segment headers are allowed on the channel."

## REFERENCE

"RFC 3095, Section 5.1.1"  
 ::= { rohcInstanceEntry 11 }

## rohcInstanceContextStorageTime OBJECT-TYPE

SYNTAX TimeInterval  
 UNITS "centi-seconds"  
 MAX-ACCESS read-write  
 STATUS current

## DESCRIPTION

"This object indicates the default maximum amount of time information on a context belonging to this instance is kept as entry in the rohcContextTable after the context is expired or terminated. The value of this object is used to initialize rohcContextStorageTime object when a new context is created. Changing the value of an rohcInstanceContextStorageTime instance does not affect any entry of the rohcContextTable created previously. ROHC-MIB implementations SHOULD store the set value of this object persistently."

DEFVAL { 360000 }  
 ::= { rohcInstanceEntry 12 }

## rohcInstanceStatus OBJECT-TYPE

SYNTAX INTEGER {  
     enabled(1),  
     disabled(2)  
 }

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Status of the instance of ROHC."

```
 ::= { rohcInstanceEntry 13 }

rohcInstanceContextsTotal OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Counter of all contexts created by this instance.

        Discontinuities in the value of this counter can
        occur at re-initialization of the management
        system, and at other times as indicated by the
        value of ifCounterDiscontinuityTime."
    ::= { rohcInstanceEntry 14 }

rohcInstanceContextsCurrent OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of currently active contexts created by this
        instance."
    ::= { rohcInstanceEntry 15 }

rohcInstancePackets OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Counter of all packets passing this instance.

        Discontinuities in the value of this counter can
        occur at re-initialization of the management
        system, and at other times as indicated by the
        value of ifCounterDiscontinuityTime."
    ::= { rohcInstanceEntry 16 }

rohcInstanceIRs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of all IR packets that are either sent
        or received by this instance.

        Discontinuities in the value of this counter can
        occur at re-initialization of the management
        system, and at other times as indicated by the
```

```
        value of ifCounterDiscontinuityTime."
REFERENCE
    "RFC 3095, Section 5.7.7.1"
 ::= { rohcInstanceEntry 17 }

rohcInstanceIRDYNs OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of all IR-DYN packets that are either sent
    or received by this instance.

    Discontinuities in the value of this counter can
    occur at re-initialization of the management
    system, and at other times as indicated by the
    value of ifCounterDiscontinuityTime."
REFERENCE
    "RFC 3095, Section 5.7.7.2"
 ::= { rohcInstanceEntry 18 }

rohcInstanceFeedbacks OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of all feedbacks that are either sent
    or received by this instance.

    Discontinuities in the value of this counter can
    occur at re-initialization of the management
    system, and at other times as indicated by the
    value of ifCounterDiscontinuityTime."
 ::= { rohcInstanceEntry 19 }

rohcInstanceCompressionRatio OBJECT-TYPE
SYNTAX      RohcCompressionRatio
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object indicates the compression ratio so far over all
    packets on the channel served by this instance. The
    compression is computed over all bytes of the IP packets
    including the IP header but excluding all lower layer
    headers."
 ::= { rohcInstanceEntry 20 }

--
```

```
-- Profile Table
--
```

```
rohcProfileTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF RohcProfileEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table lists a set of profiles supported by the
         instance."
    REFERENCE
        "RFC 3095, Section 5.1.1"
    ::= { rohcInstanceObjects 3 }

rohcProfileEntry OBJECT-TYPE
    SYNTAX      RohcProfileEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry describing a particular profile supported by
         the instance. It is indexed by the rohcChannelID
         identifying the instance and by the rohcProfile."
    INDEX { rohcChannelID, rohcProfile }
    ::= { rohcProfileTable 1 }

RohcProfileEntry ::= SEQUENCE {
    rohcProfile      Unsigned32,
    rohcProfileVendor OBJECT IDENTIFIER,
    rohcProfileVersion SnmpAdminString,
    rohcProfileDescr SnmpAdminString,
    rohcProfileNegotiated TruthValue
}

rohcProfile OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Identifier of a profile supported. For a listing of
         possible profile values, see the IANA registry for
         'Robust Header Compression (ROHC) Profile Identifiers'
         at http://www.iana.org/assignments/rohc-pro-ids"
    ::= { rohcProfileEntry 2 }

rohcProfileVendor OBJECT-TYPE
    SYNTAX      OBJECT IDENTIFIER
    MAX-ACCESS  read-only
    STATUS      current
```

```
DESCRIPTION
    "An object identifier that identifies the vendor who
    provides the implementation of robust header description.
    This object identifier SHALL point to the object identifier
    directly below the enterprise object identifier
    {1 3 6 1 4 1} allocated for the vendor. The value must be
    the object identifier {0 0} if the vendor is not known."
 ::= { rohcnProfileEntry 3 }

rohcnProfileVersion OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE (0..32))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The version number of the implementation of robust header
        compression. The zero-length string shall be used if the
        implementation does not have a version number.

        It is suggested that the version number consist of one or
        more decimal numbers separated by dots, where the first
        number is called the major version number."
 ::= { rohcnProfileEntry 4 }

rohcnProfileDescr OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A textual description of the implementation."
 ::= { rohcnProfileEntry 5 }

rohcnProfileNegotiated OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "When retrieved, this boolean object returns true
        if the profile has been negotiated to be used at
        the instance, i.e., is supported also be the
        corresponding compressor/decompressor."
 ::= { rohcnProfileEntry 6 }

--
-- Context Table
--

rohcnContextTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF RohcnContextEntry
```

```

MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "This table lists and describes all compressor contexts
    per instance."
 ::= { rohcObjects 2 }

rohcContextEntry OBJECT-TYPE
SYNTAX RohcContextEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "An entry describing a particular compressor context."
INDEX {
    rohcChannelID,
    rohcContextCID
}
 ::= { rohcContextTable 1 }

RohcContextEntry ::= SEQUENCE {
    rohcContextCID Unsigned32,
    rohcContextCIDState INTEGER,
    rohcContextProfile Unsigned32,
    rohcContextDecompressorDepth Unsigned32,
    rohcContextStorageTime TimeInterval,
    rohcContextActivationTime DateAndTime,
    rohcContextDeactivationTime DateAndTime,
    rohcContextPackets Counter32,
    rohcContextIRs Counter32,
    rohcContextIRDYNs Counter32,
    rohcContextFeedbacks Counter32,
    rohcContextDecompressorFailures Counter32,
    rohcContextDecompressorRepairs Counter32,
    rohcContextAllPacketsRatio RohcCompressionRatio,
    rohcContextAllHeadersRatio RohcCompressionRatio,
    rohcContextAllPacketsMeanSize Unsigned32,
    rohcContextAllHeadersMeanSize Unsigned32,
    rohcContextLastPacketsRatio RohcCompressionRatio,
    rohcContextLastHeadersRatio RohcCompressionRatio,
    rohcContextLastPacketsMeanSize Unsigned32,
    rohcContextLastHeadersMeanSize Unsigned32
}

rohcContextCID OBJECT-TYPE
SYNTAX Unsigned32 (0..16383)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

```

"The context identifier (CID) of this context."  
REFERENCE  
"RFC 3095, Sections 5.1.1 and 5.1.3"  
 ::= { rohContextEntry 2 }

rohContextCIDState OBJECT-TYPE  
SYNTAX INTEGER {  
 unused(1),  
 active(2),  
 expired(3),  
 terminated(4)  
 }  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"State of the CID. When a CID is assigned to a context,  
its state changes from 'unused' to 'active'. The active  
context may stop operation due to some explicit  
signalling or after observing no packet for some specified  
time. In the first case then the CID state changes to  
'terminated', in the latter case it changes to 'expired'.  
If the CID is re-used again for another context, the  
state changes back to 'active'."  
 ::= { rohContextEntry 3 }

rohContextProfile OBJECT-TYPE  
SYNTAX Unsigned32 (0..65535)  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"Identifier of the profile for this context.  
The profile is identified by its index in the  
rohContextProfileTable for this instance. There MUST exist a  
corresponding entry in the rohContextProfileTable using the  
value of rohContextProfile as second part of the index  
(and using the same rohChannelID as first part of the  
index)."  
 ::= { rohContextEntry 4 }

rohContextDecompressorDepth OBJECT-TYPE  
SYNTAX Unsigned32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"This object indicates whether reverse decompression, for  
example as described in RFC 3095, Section 6.1, is used  
on this channel or not, and if used, to what extent."

Its value is only valid for decompressor contexts, i.e., if rohcInstanceType has the value decompressor(2). For compressor contexts where rohcInstanceType has the value compressor(1), the value of this object is irrelevant and MUST be set to zero (0).

The value of the reverse decompression depth indicates the maximum number of packets that are buffered, and thus possibly be reverse decompressed by the decompressor. A zero (0) value means that reverse decompression is not used."

```
::= { rohcContextEntry 5 }
```

```
rohcContextStorageTime OBJECT-TYPE
```

```
SYNTAX      TimeInterval
UNITS       "centi-seconds"
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
```

"The value of this object specifies how long this row can exist in the rohcContextTable after the rohcContextCIDState switched to expired(3) or terminated(4). This object returns the remaining time that the row may exist before it is aged out. The object is initialized with the value of the associated rohcContextStorageTime object. After expiration or termination of the context, the value of this object ticks backwards. The entry in the rohcContextTable is destroyed when the value reaches 0.

The value of this object may be set in order to increase or reduce the remaining time that the row may exist. Setting the value to 0 will destroy this entry as soon as the rohcContextCIDState has the value expired(3) or terminated(4).

Note that there is no guarantee that the row is stored as long as this object indicates. In case of limited CID space, the instance may re-use a CID before the storage time of the corresponding row in rohcContextTable reaches the value of 0. In this case the information stored in this row is not anymore available."

```
::= { rohcContextEntry 6 }
```

```
rohcContextActivationTime OBJECT-TYPE
```

```
SYNTAX      DateAndTime
MAX-ACCESS  read-only
STATUS      current
```



## DESCRIPTION

"The date and time when the context started to be able to compress packets or decompress packets, respectively. The value '0000000000000000'H is returned if the context has not been activated yet."

DEFVAL { '0000000000000000'H }  
 ::= { rohcContextEntry 7 }

## rohcContextDeactivationTime OBJECT-TYPE

SYNTAX DateAndTime

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The date and time when the context stopped being able to compress packets or decompress packets, respectively, because it expired or was terminated for other reasons. The value '0000000000000000'H is returned if the context has not been deactivated yet."

DEFVAL { '0000000000000000'H }  
 ::= { rohcContextEntry 8 }

## rohcContextPackets OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of all packets passing this context.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable."

::= { rohcContextEntry 9 }

## rohcContextIRs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of all IR packets sent or received, respectively, by this context.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the

value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable."

## REFERENCE

"RFC 3095, Section 5.7.7.1"

::= { rohcContextEntry 10 }

## rohcContextIRDYNs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of all IR-DYN packets sent or received, respectively, by this context.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable."

## REFERENCE

"RFC 3095, Section 5.7.7.2"

::= { rohcContextEntry 11 }

## rohcContextFeedbacks OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of all feedbacks sent or received, respectively, by this context.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable."

::= { rohcContextEntry 12 }

## rohcContextDecompressorFailures OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of all decompressor failures so far in this context. The number is only valid for decompressor contexts, i.e., if rohcInstanceType has the value decompressor(2).

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable."

::= { rohcContextEntry 13 }

## rohcContextDecompressorRepairs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of all context repairs so far in this context. The number is only valid for decompressor contexts, i.e., if rohcInstanceType has the value decompressor(2).

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable."

::= { rohcContextEntry 14 }

## rohcContextAllPacketsRatio OBJECT-TYPE

SYNTAX RohcCompressionRatio

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"This object indicates the compression ratio so far over all packets passing this context. The compression is computed over all bytes of the IP packets including the IP header but excluding all lower layer headers."

::= { rohcContextEntry 15 }

## rohcContextAllHeadersRatio OBJECT-TYPE

SYNTAX RohcCompressionRatio

MAX-ACCESS read-only

```
STATUS      current
DESCRIPTION
  "This object indicates the compression ratio so far over all
  packet headers passing this context.  The compression is
  computed over all bytes of all headers that are subject to
  compression for the used profile."
 ::= { rohcContextEntry 16 }
```

```
rohcContextAllPacketsMeanSize OBJECT-TYPE
```

```
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "This object indicates the mean compressed packet size
  of all packets passing this context.  The packet size
  includes the IP header and payload but excludes all lower
  layer headers.  The mean value is given in byte rounded
  to the next integer value."
 ::= { rohcContextEntry 17 }
```

```
rohcContextAllHeadersMeanSize OBJECT-TYPE
```

```
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "This object indicates the mean compressed packet header size
  of all packets passing this context.  The packet header size
  is the sum of the size of all headers of a packet that are
  subject to compression for the used profile.  The mean value
  is given in byte rounded to the next integer value."
 ::= { rohcContextEntry 18 }
```

```
rohcContextLastPacketsRatio OBJECT-TYPE
```

```
SYNTAX      RohcCompressionRatio
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "This object indicates the compression ratio
  concerning the last 16 packets passing this context
  or concerning all packets passing this context
  if they are less than 16, so far.  The compression is
  computed over all bytes of the IP packets including the IP
  header but excluding all lower layer headers."
 ::= { rohcContextEntry 19 }
```

```
rohcContextLastHeadersRatio OBJECT-TYPE
```

```
SYNTAX      RohcCompressionRatio
MAX-ACCESS  read-only
```

```
STATUS      current
DESCRIPTION
    "This object indicates the compression ratio concerning the
    headers of the last 16 packets passing this context or
    concerning the headers of all packets passing this context
    if they are less than 16, so far. The compression is
    computed over all bytes of all headers that are subject to
    compression for the used profile."
 ::= { rohcContextEntry 20 }

rohcContextLastPacketsMeanSize OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object indicates the mean compressed packet size
    concerning the last 16 packets passing this context or
    concerning all packets passing this context if they are
    less than 16, so far. The packet size includes the IP
    header and payload but excludes all lower layer headers.
    The mean value is given in byte rounded to the next
    integer value."
 ::= { rohcContextEntry 21 }

rohcContextLastHeadersMeanSize OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object indicates the mean compressed packet header size
    concerning the last 16 packets passing this context or
    concerning all packets passing this context if they are
    less than 16, so far. The packet header size is the sum of
    the size of all headers of a packet that are subject to
    compression for the used profile. The mean value is given
    in byte rounded to the next integer value."
 ::= { rohcContextEntry 22 }

--
-- conformance information
--

rohcCompliances OBJECT IDENTIFIER ::= { rohcConformance 1 }
rohcGroups      OBJECT IDENTIFIER ::= { rohcConformance 2 }

--
-- compliance statements
--
```

```

rohcCompliance MODULE-COMPLIANCE
  STATUS      current
  DESCRIPTION
    "The compliance statement for SNMP entities that implement
    the ROHC-MIB.

    Note that compliance with this compliance
    statement requires compliance with the
    ifCompliance3 MODULE-COMPLIANCE statement of the
    IF-MIB (RFC2863)."
```

MODULE -- this module

```

MANDATORY-GROUPS {
    rohcInstanceGroup, rohcContextGroup
}
GROUP rohcStatisticsGroup
DESCRIPTION
  "A compliant implementation does not have to implement
  the rohcStatisticsGroup."
GROUP rohcTimerGroup
DESCRIPTION
  "A compliant implementation does not have to implement
  the rohcTimerGroup."
OBJECT rohcInstanceContextStorageTime
MIN-ACCESS read-only
DESCRIPTION
  "A compliant implementation does not have to support changing
  the value of object rohcInstanceContextStorageTime."
OBJECT rohcContextStorageTime
MIN-ACCESS read-only
DESCRIPTION
  "A compliant implementation does not have to support changing
  the value of object rohcContextStorageTime."
GROUP rohcContextStatisticsGroup
DESCRIPTION
  "A compliant implementation does not have to implement
  the rohcContextStatisticsGroup."
 ::= { rohcCompliances 1 }

rohcInstanceGroup OBJECT-GROUP
  OBJECTS {
    rohcChannelType,
    rohcChannelFeedbackFor,
    rohcChannelDescr,
    rohcChannelStatus,
    rohcInstanceFBChannelID,
    rohcInstanceVendor,
```

```
    rohcInstanceVersion,
    rohcInstanceDescr,
    rohcInstanceClockRes,
    rohcInstanceMaxCID,
    rohcInstanceLargeCIDs,
    rohcInstanceMRRU,
    rohcInstanceStatus,
    rohcProfileVendor,
    rohcProfileVersion,
    rohcProfileDescr,
    rohcProfileNegotiated
  }
  STATUS          current
  DESCRIPTION
    "A collection of objects providing information about
    ROHC instances, used channels and available profiles."
  ::= { rohcGroups 2 }

rohcStatisticsGroup OBJECT-GROUP
  OBJECTS {
    rohcInstanceContextsTotal,
    rohcInstanceContextsCurrent,
    rohcInstancePackets,
    rohcInstanceIRs,
    rohcInstanceIRDYNs,
    rohcInstanceFeedbacks,
    rohcInstanceCompressionRatio
  }
  STATUS          current
  DESCRIPTION
    "A collection of objects providing ROHC statistics."
  ::= { rohcGroups 4 }

rohcContextGroup OBJECT-GROUP
  OBJECTS {
    rohcContextCIDState,
    rohcContextProfile,
    rohcContextDecompressorDepth
  }
  STATUS          current
  DESCRIPTION
    "A collection of objects providing information about
    ROHC compressor contexts and decompressor contexts."
  ::= { rohcGroups 5 }

rohcTimerGroup OBJECT-GROUP
  OBJECTS {
    rohcInstanceContextStorageTime,
```

```
        rohcContextStorageTime,
        rohcContextActivationTime,
        rohcContextDeactivationTime
    }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing statistical information
         about ROHC compressor contexts and decompressor contexts."
    ::= { rohcGroups 6 }

rohcContextStatisticsGroup OBJECT-GROUP
OBJECTS {
    rohcContextPackets,
    rohcContextIRs,
    rohcContextIRDYNs,
    rohcContextFeedbacks,
    rohcContextDecompressorFailures,
    rohcContextDecompressorRepairs,
    rohcContextAllPacketsRatio,
    rohcContextAllHeadersRatio,
    rohcContextAllPacketsMeanSize,
    rohcContextAllHeadersMeanSize,
    rohcContextLastPacketsRatio,
    rohcContextLastHeadersRatio,
    rohcContextLastPacketsMeanSize,
    rohcContextLastHeadersMeanSize
}
STATUS          current
DESCRIPTION
    "A collection of objects providing statistical information
     about ROHC compressor contexts and decompressor contexts."
    ::= { rohcGroups 7 }

END

ROHC-UNCOMPRESSED-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, Counter32, mib-2
        FROM SNMPv2-SMI
        -- [RFC2578]

    MODULE-COMPLIANCE, OBJECT-GROUP
        FROM SNMPv2-CONF
        -- [RFC2580]

    rohcChannelID, rohcContextCID
        FROM ROHC-MIB;
```



## rohcUncmprMIB MODULE-IDENTITY

LAST-UPDATED "200406030000Z" -- June 3, 2004

ORGANIZATION "IETF Robust Header Compression Working Group"

## CONTACT-INFO

"WG charter:

<http://www.ietf.org/html.charters/rohc-charter.html>

## Mailing Lists:

General Discussion: rohc@ietf.org

To Subscribe: rohc-request@ietf.org

In Body: subscribe your\_email\_address

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## DESCRIPTION

"This MIB module defines a set of objects for monitoring and configuring RObust Header Compression (ROHC). The objects are specific to ROHC uncompressed (profile 0x0000).

Copyright (C) The Internet Society (2004). The initial version of this MIB module was published in RFC 3816. For full legal notices see the RFC itself or see:  
<http://www.ietf.org/copyrights/ianamib.html>"

REVISION "200406030000Z" -- June 3, 2004

DESCRIPTION "Initial version, published as RFC 3816."

::= { mib-2 113 }

--

-- The groups defined within this MIB module:

--

rohcUncmprObjects OBJECT IDENTIFIER ::= { rohcUncmprMIB 1 }

rohcUncmprConformance OBJECT IDENTIFIER ::= { rohcUncmprMIB 2 }

--

-- Context Table

--

-- The rohcUncmprContextTable lists all contexts per interface

```

-- and instance.  It extends the rohcContextTable.
--

rohcUncmprContextTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF RohcUncmprContextEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table lists and describes ROHC uncompressed profile
        specific properties of compressor contexts and
        decompressor contexts.  It extends the rohcContextTable
        of the ROHC-MIB module."
    ::= { rohcUncmprObjects 1 }

rohcUncmprContextEntry OBJECT-TYPE
    SYNTAX      RohcUncmprContextEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry describing a particular context."
    INDEX {
        rohcChannelID,
        rohcContextCID
    }
    ::= { rohcUncmprContextTable 1 }

RohcUncmprContextEntry ::= SEQUENCE {
    rohcUncmprContextState      INTEGER,
    rohcUncmprContextMode      INTEGER,
    rohcUncmprContextACKs      Counter32
}

rohcUncmprContextState OBJECT-TYPE
    SYNTAX      INTEGER {
        initAndRefresh(1),
        normal(2),
        noContext(3),
        fullContext(4)
    }

    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "State of the context. States initAndRefresh(1) and normal(2)
        are states of compressor contexts, states noContext(3)
        and fullContext(4) are states of decompressor contexts."
    REFERENCE
        "RFC 3095, Section 5.10.3"

```

```

 ::= { rohcUncmprContextEntry 3 }

rohcUncmprContextMode OBJECT-TYPE
    SYNTAX      INTEGER {
                    unidirectional(1),
                    bidirectional(2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Mode of the context."
    REFERENCE
        "RFC 3095, Section 5.10.3"
 ::= { rohcUncmprContextEntry 4 }

rohcUncmprContextACKs OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of all positive feedbacks (ACK) sent or
         received in this context, respectively.

         Discontinuities in the value of this counter can
         occur at re-initialization of the management
         system, and at other times as indicated by the
         value of ifCounterDiscontinuityTime. For checking
         ifCounterDiscontinuityTime, the interface index is
         required. It can be determined by reading the
         rohcChannelTable of the ROHC-MIB."
    REFERENCE
        "RFC 3095, Section 5.2.1"
 ::= { rohcUncmprContextEntry 5 }

--
-- conformance information
--

rohcUncmprCompliances OBJECT IDENTIFIER
 ::= { rohcUncmprConformance 1 }
rohcUncmprGroups      OBJECT IDENTIFIER
 ::= { rohcUncmprConformance 2 }

--
-- compliance statements
--

rohcUncmprCompliance MODULE-COMPLIANCE

```

```

STATUS      current
DESCRIPTION
    "The compliance statement for SNMP entities that implement
    the ROHC-UNCOMPRESSED-MIB.

    Note that compliance with this compliance
    statement requires compliance with the
    rohCompliance MODULE-COMPLIANCE statement of the
    ROHC-MIB and with the ifCompliance3 MODULE-COMPLIANCE
    statement of the IF-MIB (RFC2863)."
```

MODULE -- this module

```

MANDATORY-GROUPS {
    rohUncmprContextGroup
}
GROUP      rohUncmprStatisticsGroup
DESCRIPTION
    "A compliant implementation does not have to implement
    the rohUncmprStatisticsGroup."
 ::= { rohUncmprCompliances 1 }
```

rohUncmprContextGroup OBJECT-GROUP

```

OBJECTS {
    rohUncmprContextState,
    rohUncmprContextMode
}
STATUS      current
DESCRIPTION
    "A collection of objects providing information about
    ROHC uncompressed compressors and decompressors."
 ::= { rohUncmprGroups 1 }
```

rohUncmprStatisticsGroup OBJECT-GROUP

```

OBJECTS {
    rohUncmprContextACKs
}
STATUS      current
DESCRIPTION
    "An object providing context statistics."
 ::= { rohUncmprGroups 2 }
```

END

ROHC-RTP-MIB DEFINITIONS ::= BEGIN

IMPORTS

```

    MODULE-IDENTITY, OBJECT-TYPE,
    Unsigned32, Counter32, mib-2
    FROM SNMPv2-SMI
```

-- [RFC2578]

```
TruthValue
  FROM SNMPv2-TC -- [RFC2579]

MODULE-COMPLIANCE, OBJECT-GROUP
  FROM SNMPv2-CONF -- [RFC2580]

rohcChannelID, rohcContextCID
  FROM ROHC-MIB; -- [RFC3816]

rohcRtpMIB MODULE-IDENTITY
  LAST-UPDATED "200406030000Z" -- June 3, 2004
  ORGANIZATION "IETF Robust Header Compression Working Group"
  CONTACT-INFO
    "WG charter:
     http://www.ietf.org/html.charters/rohc-charter.html

    Mailing Lists:
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DESCRIPTION
  "This MIB module defines a set of objects for monitoring
  and configuring RObust Header Compression (ROHC).
  The objects are specific to ROHC RTP (profile 0x0001),
  ROHC UDP (profile 0x0002), and ROHC ESP (profile 0x0003)
  defined in RFC 3095 and for the ROHC LLA profile (profile
  0x0005) defined in RFC 3242.

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  initial version of this MIB module was published
  in RFC 3816. For full legal notices see the RFC
  itself or see:
  http://www.ietf.org/copyrights/ianamib.html"

REVISION      "200406030000Z" -- June 3, 2004
DESCRIPTION   "Initial version, published as RFC 3816."
 ::= { mib-2 114 }
```

```

--
-- The groups defined within this MIB module:
--

rohcRtpObjects      OBJECT IDENTIFIER ::= { rohcRtpMIB 1 }
rohcRtpConformance OBJECT IDENTIFIER ::= { rohcRtpMIB 2 }

--
-- Context Table
--
-- The rohcRtpContextTable lists all contexts per interface
-- and instance.  It extends the rohcContextTable.
--

rohcRtpContextTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF RohcRtpContextEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table lists and describes RTP profile specific
        properties of compressor contexts and decompressor
        contexts.  It extends the rohcContextTable of the
        ROHC-MIB module."
    ::= { rohcRtpObjects 1 }

rohcRtpContextEntry OBJECT-TYPE
    SYNTAX      RohcRtpContextEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry describing a particular context."
    INDEX {
        rohcChannelID,
        rohcContextCID
    }
    ::= { rohcRtpContextTable 1 }

RohcRtpContextEntry ::= SEQUENCE {
    rohcRtpContextState      INTEGER,
    rohcRtpContextMode       INTEGER,
    rohcRtpContextAlwaysPad  TruthValue,
    rohcRtpContextLargePktsAllowed TruthValue,
    rohcRtpContextVerifyPeriod Unsigned32,
    rohcRtpContextSizesAllowed Unsigned32,
    rohcRtpContextSizesUsed  Unsigned32,
    rohcRtpContextACKs       Counter32,
    rohcRtpContextNACKs      Counter32,
    rohcRtpContextSNACKs     Counter32,

```

```

    rohcRtpContextNHPs          Counter32,
    rohcRtpContextCSPs         Counter32,
    rohcRtpContextCCPs         Counter32,
    rohcRtpContextPktsLostPhysical Counter32,
    rohcRtpContextPktsLostPreLink Counter32
}

rohcRtpContextState OBJECT-TYPE
    SYNTAX          INTEGER {
        initAndRefresh(1),
        firstOrder(2),
        secondOrder(3),
        noContext(4),
        staticContext(5),
        fullContext(6)
    }
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "State of the context as defined in RFC 3095. States
        initAndRefresh(1), firstOrder(2), and secondOrder(3)
        are states of compressor contexts, states noContext(4),
        staticContext(5) and fullContext(6) are states of
        decompressor contexts."
    REFERENCE
        "RFC 3095"
    ::= { rohcRtpContextEntry 3 }

rohcRtpContextMode OBJECT-TYPE
    SYNTAX          INTEGER {
        unidirectional(1),
        optimistic(2),
        reliable(3)
    }
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Mode of the context."
    REFERENCE
        "RFC 3095, Section 4.4"
    ::= { rohcRtpContextEntry 4 }

rohcRtpContextAlwaysPad OBJECT-TYPE
    SYNTAX          TruthValue
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Boolean, only applicable to compressor contexts using the

```

LLA profile. If its value is true, the compressor must pad every RHP packet with a minimum of one octet ROHC padding.

The value of this object is only valid for LLA profiles, i.e., if the corresponding rohcProfile has a value of 0x0005. If the corresponding rohcProfile has a value other than 0x0005, then this object MUST NOT be instantiated."

## REFERENCE

"RFC 3242, Section 5.1.1"

DEFVAL { false }

::= { rohcRtpContextEntry 5 }

## rohcRtpContextLargePktsAllowed OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Boolean, only applicable to compressor contexts using the LLA profile. It specifies how to handle packets that do not fit any of the preferred packet sizes specified. If its value is true, the compressor must deliver the larger packet as-is and must not use segmentation. If it is set to false, the ROHC segmentation scheme must be used to split the packet into two or more segments, and each segment must further be padded to fit one of the preferred packet sizes.

The value of this object is only valid for LLA profiles, i.e., if the corresponding rohcProfile has a value of 0x0005. If the corresponding rohcProfile has a value other than 0x0005, then this object MUST NOT be instantiated."

## REFERENCE

"RFC 3242, Section 5.1.1"

DEFVAL { true }

::= { rohcRtpContextEntry 6 }

## rohcRtpContextVerifyPeriod OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"This object is only applicable to compressor contexts using the LLA profile. It specifies the minimum frequency with which a packet validating the context must be sent. This tells the compressor that a packet containing a CRC



field must be sent at least once every N packets, where N is the value of the object. A value of 0 indicates that periodical verifications are disabled.

The value of this object is only valid for LLA profiles, i.e., if the corresponding rohcProfile has a value of 0x0005. If the corresponding rohcProfile has a value other than 0x0005, then this object MUST NOT be instantiated."

## REFERENCE

"RFC 3242, Section 5.1.1"

DEFVAL { 0 }

::= { rohcRtpContextEntry 7 }

rohcRtpContextSizesAllowed OBJECT-TYPE  
 SYNTAX Unsigned32 (1..4294967295)  
 MAX-ACCESS read-only  
 STATUS current  
 DESCRIPTION

"The value of this object is only valid for decompressor contexts, i.e., if rohcInstanceType of the corresponding rohcContextEntry has the value decompressor(2). For compressor contexts where rohcInstanceType has the value compressor(1), this object MUST NOT be instantiated.

This object contains the number of different packet sizes that may be used in the context."

## REFERENCE

"RFC 3095, Section 6.3.1"

::= { rohcRtpContextEntry 8 }

rohcRtpContextSizesUsed OBJECT-TYPE  
 SYNTAX Unsigned32 (1..4294967295)  
 MAX-ACCESS read-only  
 STATUS current  
 DESCRIPTION

"The value of this object is only valid for decompressor contexts, i.e., if rohcInstanceType of the corresponding rohcContextEntry has the value decompressor(2). For compressor contexts where rohcInstanceType has the value compressor(1), this object MUST NOT be instantiated.

This object contains the number of different packet sizes that are used in the context."

## REFERENCE

"RFC 3095, Section 6.3.1"

::= { rohcRtpContextEntry 9 }

## rohcRtpContextACKs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of all positive feedbacks (ACK) sent or received in this context, respectively.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable of the ROHC-MIB."

## REFERENCE

"RFC 3095, Section 5.2.1."

::= { rohcRtpContextEntry 10 }

## rohcRtpContextNACKs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of all dynamic negative feedbacks (ACK) sent or received in this context, respectively.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable of the ROHC-MIB."

## REFERENCE

"RFC 3095, Section 5.2.1."

::= { rohcRtpContextEntry 11 }

## rohcRtpContextSNACKs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of all static negative feedbacks (ACK) sent or received in this context, respectively.

Discontinuities in the value of this counter can occur at re-initialization of the management

system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable of the ROHC-MIB."

## REFERENCE

"RFC 3095, Section 5.2.1."  
 ::= { rohcRtpContextEntry 12 }

## rohcRtpContextNHPs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"This object is only applicable to contexts using the LLA profile. It contains the number of all no-header packets (NHP) sent or received in this context, respectively.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable of the ROHC-MIB.

The value of this object is only valid for LLA profiles, i.e., if the corresponding rohcProfile has a value of 0x0005. If the corresponding rohcProfile has a value other than 0x0005, then this object MUST NOT be instantiated."

## REFERENCE

"RFC 3242, Section 4.1.1."  
 ::= { rohcRtpContextEntry 13 }

## rohcRtpContextCSPs OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"This object is only applicable to contexts using the LLA profile. It contains the number of all context synchronization packets (CSP) sent or received in this context, respectively.

Discontinuities in the value of this counter can occur at re-initialization of the management

system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable of the ROHC-MIB.

The value of this object is only valid for LLA profiles, i.e., if the corresponding rohcProfile has a value of 0x0005. If the corresponding rohcProfile has a value other than 0x0005, then this object MUST NOT be instantiated."

## REFERENCE

"RFC 3242, Section 4.1.2."  
 ::= { rohcRtpContextEntry 14 }

## rohcRtpContextCCPs OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current

## DESCRIPTION

"This object is only applicable to contexts using the LLA profile. It contains the number of all context check packets (CCP) sent or received in this context, respectively.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable of the ROHC-MIB.

The value of this object is only valid for LLA profiles, i.e., if the corresponding rohcProfile has a value of 0x0005. If the corresponding rohcProfile has a value other than 0x0005, then this object MUST NOT be instantiated."

## REFERENCE

"RFC 3242, Section 4.1.3."  
 ::= { rohcRtpContextEntry 15 }

## rohcRtpContextPktsLostPhysical OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current

## DESCRIPTION

"This object is only applicable to decompressor contexts

using the LLA profile. It contains the number of physical packet losses on the link between compressor and decompressor, that have been indicated to the decompressor.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable of the ROHC-MIB.

The value of this object is only valid for LLA profiles, i.e., if the corresponding rohcProfile has a value of 0x0005. If the corresponding rohcProfile has a value other than 0x0005, then this object MUST NOT be instantiated."

REFERENCE

"RFC 3242, Section 5.1.2."  
 ::= { rohcRtpContextEntry 16 }

rohcRtpContextPktsLostPreLink OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object is only applicable to decompressor contexts using the LLA profile. It contains the number of pre-link packet losses on the link between compressor and decompressor, that have been indicated to the decompressor.

Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of ifCounterDiscontinuityTime. For checking ifCounterDiscontinuityTime, the interface index is required. It can be determined by reading the rohcChannelTable of the ROHC-MIB.

The value of this object is only valid for LLA profiles, i.e., if the corresponding rohcProfile has a value of 0x0005. If the corresponding rohcProfile has a value other than 0x0005, then this object MUST NOT be instantiated."

REFERENCE

"RFC 3242, Section 5.1.2."  
 ::= { rohcRtpContextEntry 17 }

```

--
-- Packet Sizes Table
--
-- The rohcPacketSizeTable lists allowed, preferred, and used
-- packet sizes per compressor context.

rohcRtpPacketSizeTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF RohcRtpPacketSizeEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table lists all allowed, preferred, and used packet
        sizes per compressor context and channel.

        Note, that the sizes table represents implementation
        parameters that are suggested by RFC 3095 and/or RFC 3242,
        but that are not mandatory."
    ::= { rohcRtpObjects 2 }

rohcRtpPacketSizeEntry OBJECT-TYPE
    SYNTAX      RohcRtpPacketSizeEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry of a particular packet size."
    INDEX {
        rohcChannelID,
        rohcContextCID,
        rohcRtpPacketSize
    }
    ::= { rohcRtpPacketSizeTable 1 }

RohcRtpPacketSizeEntry ::= SEQUENCE {
    rohcRtpPacketSize      Unsigned32,
    rohcRtpPacketSizePreferred TruthValue,
    rohcRtpPacketSizeUsed   TruthValue,
    rohcRtpPacketSizeRestrictedType INTEGER
}

rohcRtpPacketSize OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A packet size used as index."
    ::= { rohcRtpPacketSizeEntry 3 }

rohcRtpPacketSizePreferred OBJECT-TYPE

```

SYNTAX TruthValue  
 MAX-ACCESS read-only  
 STATUS current  
 DESCRIPTION

"This object is only applicable to compressor contexts using the LLA profile. When retrieved, it will have the value true(1) if the packet size is preferred. Otherwise, its value will be false(2).

The value of this object is only valid for LLA profiles, i.e., if the corresponding rohcProfile has a value of 0x0005. If the corresponding rohcProfile has a value other than 0x0005, then this object MUST NOT be instantiated."

## REFERENCE

"RFC 3242, Section 5.1.1"  
 ::= { rohcRtpPacketSizeEntry 4 }

## rohcRtpPacketSizeUsed OBJECT-TYPE

SYNTAX TruthValue  
 MAX-ACCESS read-only  
 STATUS current  
 DESCRIPTION

"This object is only applicable to compressor contexts using the UDP, RTP, or ESP profile. When retrieved, it will have the value true(1) if the packet size is used. Otherwise, its value will be false(2).

The value of this object is only valid for UDP, RTP, and ESP profiles, i.e., if the corresponding rohcProfile has a value of either 0x0001, 0x0002 or 0x0003. If the corresponding rohcProfile has a value other than 0x0001, 0x0002 or 0x0003, then this object MUST NOT be instantiated."

## REFERENCE

"RFC 3095, Section 6.3.1"  
 ::= { rohcRtpPacketSizeEntry 5 }

## rohcRtpPacketSizeRestrictedType OBJECT-TYPE

SYNTAX INTEGER {  
     nhpOnly(1),  
     rhpOnly(2),  
     noRestrictions(3)  
 }  
 MAX-ACCESS read-only  
 STATUS current  
 DESCRIPTION

"This object is only applicable to preferred packet

sizes of compressor contexts using the LLA profile. When retrieved, it will indicate whether the packet size is preferred for NHP only, for RHP only, or for both of them.

The value of this object is only valid for LLA profiles, i.e., if the corresponding rohcProfile has a value of 0x0005. If the corresponding rohcProfile has a value other than 0x0005, then this object MUST NOT be instantiated."

REFERENCE

"RFC 3242, Section 5.1.1"

::= { rohcRtpPacketSizeEntry 6 }

--

-- conformance information

--

rohcRtpCompliances OBJECT IDENTIFIER ::= { rohcRtpConformance 1 }  
 rohcRtpGroups OBJECT IDENTIFIER ::= { rohcRtpConformance 2 }

--

-- compliance statements

--

rohcRtpCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"The compliance statement for SNMP entities that implement the ROHC-RTP-MIB.

Note that compliance with this compliance statement requires compliance with the rohcCompliance MODULE-COMPLIANCE statement of the ROHC-MIB and with the ifCompliance3 MODULE-COMPLIANCE statement of the IF-MIB (RFC2863)."

MODULE -- this module

MANDATORY-GROUPS {  
     rohcRtpContextGroup

}

GROUP rohcRtpPacketSizesGroup

DESCRIPTION

"A compliant implementation does not have to implement the rohcRtpPacketSizesGroup."

GROUP rohcRtpStatisticsGroup

DESCRIPTION

"A compliant implementation does not have to implement the rohcRtpStatisticsGroup."

::= { rohcRtpCompliances 1 }



```
rohcRtpContextGroup OBJECT-GROUP
  OBJECTS {
    rohcRtpContextState,
    rohcRtpContextMode,
    rohcRtpContextAlwaysPad,
    rohcRtpContextLargePktsAllowed,
    rohcRtpContextVerifyPeriod
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects providing information about
    ROHC RTP compressors and decompressors."
  ::= { rohcRtpGroups 1 }

rohcRtpPacketSizesGroup OBJECT-GROUP
  OBJECTS {
    rohcRtpContextSizesAllowed,
    rohcRtpContextSizesUsed,
    rohcRtpPacketSizePreferred,
    rohcRtpPacketSizeUsed,
    rohcRtpPacketSizeRestrictedType
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects providing information about
    allowed and used packet sizes at a ROHC RTP compressor."
  ::= { rohcRtpGroups 2 }

rohcRtpStatisticsGroup OBJECT-GROUP
  OBJECTS {
    rohcRtpContextACKs,
    rohcRtpContextNACKs,
    rohcRtpContextSNACKs,
    rohcRtpContextNHPs,
    rohcRtpContextCSPs,
    rohcRtpContextCCPs,
    rohcRtpContextPktsLostPhysical,
    rohcRtpContextPktsLostPreLink
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects providing ROHC compressor and
    decompressor statistics."
  ::= { rohcRtpGroups 3 }

END
```

## 6. Security Considerations

The managed objects defined by the ROHC-MIB module, the ROHC-UNCOMPRESSED-MIB module and the ROHC-RTP-MIB module do not have a MAX-ACCESS value of read-write and/or read-create except rohcInstanceContextStorageTime and rohcContextStorageTime, both of which have a MAX-ACCESS value of read-write. These objects determine how long context information is stored after its termination. Unauthorized access to these objects can have one of two negative effects. If they are set to a value lower than required, e.g., to zero, then context information about past contexts might get lost. If they are set to a very high value, then context information will not be deleted and memory consumption of the agent implementation might become very high. However, unauthorized access to these objects cannot cause harm to existing ROHC connections nor can it allow manipulation of running instances of ROHC in a malicious way.

Another security issue is unauthorized access to readable objects in the MIB modules for getting information about existing communication sessions. 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. However, the only information that might be disclosed is the use of channels. Users and their addresses are not visible in the MIB. This information can only be mis-used in conjunction with the mis-use of further information.

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. Acknowledgements

Many thanks to Lars-Erik Jonsson and Mark West for their guidance through the ROHC world and to Ghyslain Pelletier for explaining how the ROHC LLA profile works. Further thanks to Frank Strauss for his advice on tricky SMI issues. Special thanks to Mike Heard who acted as MIB doctor. He studied every tiny detail, raised a long list of issues and helped to significantly improve this document.

## 8. References

### 8.1. Normative References

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- [RFC3095] Bormann, C., Burmeister, C., Degermark, M., Fukushima, H., Hannu, H., Jonsson, L., Hakenberg, R., Koren, T., Le, K., Liu, Z., Martensson, A., Miyazaki, A., Svanbro, K., Wiebke, T., Yoshimura, T., and H. Zheng, "RObust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP, and uncompressed", RFC 3095, July 2001.
- [RFC3242] Jonsson, L. and G. Pelletier, "RObust Header Compression (ROHC): A Link-Layer Assisted Profile for IP/UDP/RTP", RFC 3242, April 2002.
- [RFC3411] Harrington, D., Presuhn, R., and B. Wijnen, "An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks", STD 62, RFC 3411, December 2002.
- [RFC3759] Jonsson, L., "RObust Header Compression (ROHC): Terminology and Channel Mapping Examples", RFC 3759, April 2004.

## 8.2. Informative References

- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart,  
"Introduction and Applicability Statements for Internet-  
Standard Management Framework", RFC 3410, December 2002.

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