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**Management Information Base for Cryptographically Generated Addresses
(CGA)
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Abstract

This memo defines a portion of the Management Information Base (MIB) for managing Cryptographically Generated Addresses (CGA).

Status of this Memo

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1. 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](#)].

2. Overview

This document defines the portion of the Management Information Base (MIB) to be used for managing Cryptographically Generated Addresses (CGA) [[RFC3972](#)]. CGA addresses are IPv6 addresses for which the interface identifier is generated by computing a one-way hash function from a public signature key and some auxiliary parameters. Therefore, CGA are represented in this MIB module as values of the InetAddressIPv6 type defined in [[RFC4001](#)].

Two tables are defined, `cgaLocalTable` for representing the information about CGA local to the managed node, and `cgaRemoteTable` for representing CGA of nodes with which the managed node is communicating to.

Rows in the `cgaLocalTable` may be created by means of the management protocol. Once a row for a CGA has been created in the `cgaLocalTable`, it can be used as a local address by the node when the configuration of the corresponding rows in the `ipAddressTable` [[RFC4293](#)] is completed. A discrete spin lock object is used to coordinate the creation of rows by different managers.

Rows in the `cgaRemoteTable` are created as a result of CGA-aware protocol operation, such as SEND [[RFC3971](#)] or Shim6 [[RFC5533](#)] operation.

3. Conventions

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](#)].

4. Definitions

```
CGA-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY,
    OBJECT-TYPE,
    mib-2,
    zeroDotZero                      FROM SNMPv2-SMI
    TEXTUAL-CONVENTION,
    TestAndIncr,
    RowStatus,
    StorageType,
    TimeStamp,
    RowPointer                      FROM SNMPv2-TC
    MODULE-COMPLIANCE,
    OBJECT-GROUP                   FROM SNMPv2-CONF
    InetAddressIPv6                FROM INET-ADDRESS-MIB;
```

```
cgaMIB MODULE-IDENTITY
```

```
    LAST-UPDATED "201102020000Z"
```

```
    ORGANIZATION "IETF CSI (Cga & Send Maintenance) Working Group"
```

```
    CONTACT-INFO
```

```
        "Editor:
```

```

        Alberto Garcia-Martinez
        U. Carlos III de Madrid
        Avenida Universidad, 30
        Leganes, Madrid 28911
        Spain
        Email: alberto.garcia@uc3m.es"
```

```
DESCRIPTION
```

```
    " The MIB module for managing Cryptographically Generated
    Addresses (CGA) [RFC3972].
```

```

    Copyright (c) 2011 IETF Trust and the persons identified
    as the document authors. All rights reserved.
    This version of this MIB module is part of RFC yyyy; see
    the RFC itself for full legal notices."
```

```
-- RFC Ed.: replace yyyy with actual RFC number & remove this
-- note
```

```
REVISION "201102020000Z"
```


DESCRIPTION

"Initial version, published as RFC yyyy."

-- RFC Ed.: replace yyyy with actual RFC number & remove
-- this note

::= { mib-2 XXX }

-- RFC Ed.: replace XXX with actual number assigned by IANA
-- & remove this note

--

-- The textual conventions we define and use in this MIB.

--

CgaModifier ::= TEXTUAL-CONVENTION

DISPLAY-HINT "16x"

STATUS current

DESCRIPTION

"This is a binary string of 16 octets in network byte-order representing a 128-bit unsigned integer, which models the 'Modifier' parameter of the CGA."

SYNTAX OCTET STRING (SIZE (16))

CgaCollisionCount ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This enumerated integer models the 'Collision Count' parameter of the CGA."

SYNTAX INTEGER {
 zerocollisions(0),
 onecollision(1),
 twocollisions(2)
}

CgaKeyInfo ::= TEXTUAL-CONVENTION

DISPLAY-HINT "1024x"

STATUS current

DESCRIPTION

"Variable-length field containing the key (either public or private) of the address (CGA) owner. The key MUST be formatted as a DER-encoded [[CCITT.X690.2002](#)] ASN.1 structure of the type SubjectPublicKeyInfo, defined in the Internet X.509 certificate profile [[RFC5280](#)]. When RSA is used, the algorithm identifier MUST be 'rsaEncryption', which is 1.2.840.113549.1.1.1, and the RSA public key MUST be formatted by using the RSAPublicKey type as specified

in [Section 2.3.1 of RFC 3279](#) [[RFC3279](#)].

The length of this field is determined by the ASN.1 encoding."

REFERENCE "[RFC 3279](#), [RFC 5280](#), ITU-T Recommendation X.690"

SYNTAX OCTET STRING (SIZE (0..1024))

cga OBJECT IDENTIFIER ::= { cgaMIB 1 }

--

-- Information related to local CGA

--

cgaLocalSpinLock OBJECT-TYPE

SYNTAX TestAndIncr

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"An advisory lock used to allow cooperating SNMP managers to coordinate their use of the set operation in creating or removing rows within the cgaLocalTable. Note that the rows in the cgaLocalTable MUST remain unmodified (except for the RowStatus columnar object) once the cgaLocalStatus columnar object has been set to enabled(2).

In order to use this lock to coordinate the use of set operations, managers SHOULD first retrieve cgaLocalSpinLock. They SHOULD then determine the appropriate row to create or remove (setting the appropriate value to the cgaLocalRowStatus object). Finally, they SHOULD issue the appropriate set command, including the retrieved value of cgaLocalSpinLock. If another manager has created or destroyed the row in the meantime, then the value of cgaLocalSpinLock will have changed, and the creation will fail as it will be specifying an incorrect value for cgaLocalSpinLock. It is suggested, but not required, that the cgaLocalSpinLock be the first var bind for each set of objects representing a 'row' in a PDU."

::= { cga 1 }

cgaLocalTable OBJECT-TYPE

SYNTAX SEQUENCE OF CgaLocalEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains information describing the CGA parameters which can be used to configure local addresses in the managed system."

::= { cga 2 }

cgaLocalEntry OBJECT-TYPE

SYNTAX CgaLocalEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Each row defines the information required to configure and use a CGA as a local address in the managed system. In order to have a local IP address configured as a CGA, two conditions MUST be fulfilled:

- + A row in the cgaLocalTable with cgaLocalStatus set to enabled(2). The enabled(2) value can only be set if the information held in the columnar objects of the row is valid according to the verification process defined in [section 5 of \[RFC3972\]](#).
- + A row IP-MIB:ipAddressTable with a IP-MIB:ipAddressAddr value equal to the cgaLocalAddr, with a IP-MIB:ipAddressRowStatus value set to active(1), and with an appropriate IP-MIB:ipAddressStatus value - for example, not invalid(3) or inaccessible(4).

If the cgaLocalStatus of a row is set to enabled(2) when the corresponding row in IP-MIB:ipAddressTable does not exist, this row SHOULD be created and its IP-MIB:ipAddressRowStatus value should be set to active(1). In this case, the address MUST behave as a CGA since its very activation as an IP address: For example, in a node with SEND operation enabled, the Duplicate Address Detection procedure for this address will be performed as described in the SEND specification [[RFC3971](#)], using the CGA-specific information.

If a local IP address is configured as a CGA, but the corresponding row in the cgaLocalTable is made unusable or the cgaLocalStatus value is set to a value different to enabled(2), the CGA SHOULD continue to be usable as an IP address, although CGA-aware protocols SHOULD stop using it as a CGA. For example, Shim6 could keep the communications established, although may not use the CGA information for new communications; or could tear down all communications using Shim6, and stop using the CGA.

If a row in the IP-MIB:ipAddressTable exists with its IP-MIB:ipAddressRowStatus set to active(1) exists, but there is no correspondent entry in the cgaLocalTable or the corresponding entry has a cgaLocalStatus object set to a value different to enabled(2), then the IP address is configured, but it does not behave as a CGA. Then, cgaLocalStatus value of the corresponding row in the

cgaLocalTable is set to to enabled(2), the node SHOULD start using the address as a CGA for the operation of the CGA-aware protocols.

If a row in the cgaLocalTable with the cgaLocalStatus object set to enabled(2) exists, but the IP address is not configured because there is no correspondent row in the IP-MIB:ipAddressTable (for example, because it has been removed after creation of the CGA) or the IP-MIB:ipAddressRowStatus is not set to active(1), and then the value IP-MIB:ipAddressRowStatus is set to active(1), the node SHOULD start using the address as a CGA for the operation of the CGA-aware protocols.

Once the value of the cgaLocalStatus of an entry has been set once to enabled(2), the cgaLocalModifier, cgaLocalCollisionCount, cgaLocalPublicKey, cgaLocalPrivateKey and cgaLocalExtensionFields columnar objects of the entry MUST remain unmodified.

The agent may generate new entries by other means than network management."

```
INDEX { cgaLocalAddr }  
 ::= { cgaLocalTable 1 }
```

```
CgaLocalEntry ::= SEQUENCE {  
    cgaLocalAddr InetAddressIPv6,  
    cgaLocalModifier CgaModifier,  
    cgaLocalCollisionCount CgaCollisionCount,  
    cgaLocalPublicKey CgaKeyInfo,  
    cgaLocalPrivateKey CgaKeyInfo,  
    cgaLocalExtensionFields OCTET STRING,  
    cgaLocalStatus INTEGER,  
    cgaLocalAddrInfo RowPointer,  
    cgaLocalRowStatus RowStatus,  
    cgaLocalStorageType StorageType  
}
```

```
cgaLocalAddr OBJECT-TYPE  
    SYNTAX InetAddressIPv6  
    MAX-ACCESS not-accessible  
    STATUS current  
    DESCRIPTION  
        "The CGA address to which this entry's information  
        pertains."  
    ::= { cgaLocalEntry 1 }
```

```
cgaLocalModifier OBJECT-TYPE  
    SYNTAX CgaModifier
```


MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "Binary string of 16 octets in network byte-order
 representing a 128-bit unsigned integer, which models the
 'Modifier' parameter.
 This object MUST NOT be modified once the
 cgaLocalRowStatus object has been set to enabled(2)."
::= { cgaLocalEntry 2 }

cgaLocalCollisionCount OBJECT-TYPE
 SYNTAX CgaCollisionCount
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "This enumerated integer models the 'Collision Count'
 parameter of the CGA.
 This object MUST NOT be modified once the
 cgaLocalRowStatus object has been set to enabled(2)."
::= { cgaLocalEntry 3 }

cgaLocalPublicKey OBJECT-TYPE
 SYNTAX CgaKeyInfo
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "Variable-length field containing the public key of the
 address owner which models the 'Public Key' parameter of
 the CGA.
 Upon a set operation, an 'inconsistentValue' error MUST be
 returned if the value is not a DER-encoded ASN.1 structure
 of the type SubjectPublicKeyInfo.
 This object MUST NOT be modified once the
 cgaLocalRowStatus object has been set to enabled(2)."
 REFERENCE "[RFC 3279](#), [RFC 5280](#), ITU-T Recommendation X.690"
::= { cgaLocalEntry 4 }

cgaLocalPrivateKey OBJECT-TYPE
 SYNTAX CgaKeyInfo
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "Variable-length field containing the private key of the
 address owner which corresponds to the public key in
 cgaLocalPublicKey.
 Upon a set operation, an 'inconsistentValue' error MUST be
 returned if the value is not a DER-encoded ASN.1 structure
 of the type SubjectPublicKeyInfo.

This object MUST NOT be modified once the cgaLocalRowStatus object has been set to enabled(2). Note that read access to this object by an unintended party allows this party to impersonate the identity defined by any CGA of the node."

REFERENCE "[RFC 3279](#), [RFC 5280](#), ITU-T Recommendation X.690"

::= { cgaLocalEntry 5 }

cgaLocalExtensionFields OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0..1024))

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Optional variable-length field, defined as an opaque type, modeling the 'Extension Fields' field of the CGA. This object MUST NOT be modified once the cgaLocalRowStatus object has been set to enabled(2)."

::= { cgaLocalEntry 6 }

cgaLocalStatus OBJECT-TYPE

SYNTAX INTEGER {

notReady(1),

enabled(2),

invalid(3) }

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This columnar object indicates whether the row can be used as a CGA in the managed system or not. If the row is created but this object has not been set, its value is notReady(1). In this state, the information of the row MUST NOT be used for address configuration. In addition, it cannot be assumed that the information is valid according to the rules stated in [section 5 of \[RFC3972\]](#)

If the administrator wants to make the CGA information in this row ready to be used, he MUST set this columnar object to enabled(2). The managed node MUST then check the validity of the CGA according to the rules stated in [section 5 of \[RFC3972\]](#). If the validation is successful, the state is changed to enabled(2). Otherwise, an 'inconsistentValue' error is returned, and the state is set to invalid(3).

The administrator can set this columnar object to notReady(1) to indicate that the information of the CGA is no longer usable.

Note that the invalid(3) value cannot be requested to be set."

DEFVAL { notReady }
::= { cgaLocalEntry 7 }

cgaLocalAddrInfo OBJECT-TYPE

SYNTAX RowPointer
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"Points to the corresponding row in IP-MIB:ipAddressTable if the CGA address is locally configured in the managed system.

If the CGA is not configured as a local address of the node, it contains { 0 0 }."

DEFVAL { zeroDotZero }
::= { cgaLocalEntry 8 }

cgaLocalRowStatus OBJECT-TYPE

SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION

"The status of this conceptual row.

A conceptual row can not be made active until all the columnar objects, except for the cgaLocalStatus, have been assigned a value. Note that validity of the CGA information (according to the rules stated in [section 5 of \[RFC3972\]](#)) is not required for this object to be active(1)"

::= { cgaLocalEntry 9 }

cgaLocalStorageType OBJECT-TYPE

SYNTAX StorageType
MAX-ACCESS read-create
STATUS current
DESCRIPTION

"The storage type for this conceptual row. If this object has a value of 'permanent', then no other objects are required to be able to be modified.

The values of the cgaLocalStorageType and of the corresponding IP-MIB:ipAddressStorageType SHOULD be the same."

DEFVAL { volatile }
::= { cgaLocalEntry 10 }

--

-- table to store information about the valid CGAs corresponding

-- to remote nodes

--

cgaRemoteTable OBJECT-TYPE

SYNTAX SEQUENCE OF CgaRemoteEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"List of valid CGA addresses of remote nodes. Only valid CGAs, according to the validation rules of [section 5 of \[RFC3972\]](#), MUST appear in this table.

The agent populates the entries in this table with the information obtained using a CGA-aware protocol (i.e. SEND or Shim6), and operation with these protocols is responsible for deleting the entry according to the rules defined for their operation. Protocol-specific information associated with the CGA MUST be managed in a MIB specific for the considered protocol. Note that many protocols could be using the same remote CGA.

Note in addition that each protocol may require different rules for validating a CGA (for example, may vary in the minimum bits required for the key length).

All the objects in this table are defined as read-only."

::= { cga 3 }

cgaRemoteEntry OBJECT-TYPE

SYNTAX CgaRemoteEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information related with a remote CGA."

INDEX { cgaRemoteAddr }

::= { cgaRemoteTable 1 }

CgaRemoteEntry ::= SEQUENCE {

cgaRemoteAddr InetAddressIPv6,

cgaRemoteModifier CgaModifier,

cgaRemoteCollisionCount CgaCollisionCount,

cgaRemotePublicKey CgaKeyInfo,

cgaRemoteExtensionFields OCTET STRING,

cgaRemoteCreated TimeStamp

}

cgaRemoteAddr OBJECT-TYPE

SYNTAX InetAddressIPv6
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "The CGA IPv6 address of a remote node to which this
 entry's information is associated."
::= { cgaRemoteEntry 1 }

cgaRemoteModifier OBJECT-TYPE
 SYNTAX CgaModifier
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Binary string of 16 octets in network byte-order
 representing a 128-bit unsigned integer, which models the
 'Modifier' parameter."
 ::= { cgaRemoteEntry 2 }

cgaRemoteCollisionCount OBJECT-TYPE
 SYNTAX CgaCollisionCount
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Enumerated integer which models the 'Collision Count'
 parameter of the CGA."
 ::= { cgaRemoteEntry 3 }

cgaRemotePublicKey OBJECT-TYPE
 SYNTAX CgaKeyInfo
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Variable-length field containing the public key of the
 remote node owner of the address, which models the 'Public
 Key' parameter of the CGA."
 ::= { cgaRemoteEntry 4 }

cgaRemoteExtensionFields OBJECT-TYPE
 SYNTAX OCTET STRING (SIZE (0..1024))
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Optional variable-length field. Defined as an opaque
 type, containing the 'Extension Fields' of the CGA."
 ::= { cgaRemoteEntry 5 }

cgaRemoteCreated OBJECT-TYPE


```
SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The value of the sysUpTime object at the time this entry
    was created.  If this entry was created prior to the last
    re-initialization of the local network management
    subsystem, then this object contains a zero value."
 ::= { cgaRemoteEntry 6 }

--
-- conformance information
--

cgaMIBConformance OBJECT IDENTIFIER ::= { cgaMIB 2 }

cgaMIBCompliances OBJECT IDENTIFIER ::= { cgaMIBConformance 1 }

cgaMIBGroups OBJECT IDENTIFIER ::= { cgaMIBConformance 2 }

cgaMIBFullCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "When this MIB is implemented for read-create access to
        the information related to the local CGA, the
        implementation can claim full compliance."
    MODULE -- this module
    MANDATORY-GROUPS { cgaLocalGroup, cgaRemoteGroup }

    OBJECT cgaLocalRowStatus
    SYNTAX RowStatus { active(1) }
    WRITE-SYNTAX RowStatus { active(1),
        createAndGo(4), destroy(6) }
    DESCRIPTION
        "Support for createAndWait and notInService is not
        required."

    ::= { cgaMIBCompliances 1 }

cgaMIBReadOnlyCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "When this MIB is implemented without read-create access
        to the information related to the local CGA, the
        implementation can claim read-only compliance."
```


In this case the cgaLocalPrivateKey may or may not be accessible."

MODULE -- this module

MANDATORY-GROUPS { cgaLocalGroup, cgaRemoteGroup }

OBJECT cgaLocalSpinLock

MIN-ACCESS not-accessible

DESCRIPTION

"An agent is not required to implement this object. However, if an agent provides write access to any of the other objects in the cgaLocalGroup, it SHOULD provide write access to this object as well."

OBJECT cgaLocalModifier

MIN-ACCESS read-only

DESCRIPTION

"An agent is not required to provide write or create access to this object."

OBJECT cgaLocalCollisionCount

MIN-ACCESS read-only

DESCRIPTION

"An agent is not required to provide write or create access to this object."

OBJECT cgaLocalPublicKey

MIN-ACCESS read-only

DESCRIPTION

"An agent is not required to provide write or create access to this object."

OBJECT cgaLocalPrivateKey

MIN-ACCESS not-accessible

DESCRIPTION

"An agent is not required to provide write or create access to this object. Read access to this object is also not required. If write access is not provided to other objects in the cgaLocalGroup, or for security reasons, the cgaLocalPrivateKey MAY not be readable."

OBJECT cgaLocalExtensionFields

MIN-ACCESS read-only

DESCRIPTION

"An agent is not required to provide write or create access to this object."

OBJECT cgaLocalStatus
MIN-ACCESS read-only
DESCRIPTION
 "An agent is not required to provide write or create
 access to this object."

OBJECT cgaLocalRowStatus
SYNTAX RowStatus { active(1) }
MIN-ACCESS read-only
DESCRIPTION
 "An agent is not required to provide write or create
 access to this object. In this case, the only value
 permitted is active(1)."

OBJECT cgaLocalStorageType
MIN-ACCESS read-only
DESCRIPTION
 "An agent is not required to provide write or create
 access to this object. If an agent allows this object to
 be written or created, it is not required to allow this
 object to be set to readOnly, permanent, or nonVolatile."

::= { cgaMIBCompliances 2 }

-- group definitions

cgaLocalGroup OBJECT-GROUP
 OBJECTS {
 cgaLocalSpinLock, cgaLocalModifier, cgaLocalCollisionCount,
 cgaLocalPublicKey, cgaLocalPrivateKey,
 cgaLocalExtensionFields, cgaLocalStatus, cgaLocalAddrInfo,
 cgaLocalRowStatus, cgaLocalStorageType }
 STATUS current
 DESCRIPTION
 "The group of the elements representing the components of
 the CGA Parameters data structure for the local node."
 ::= { cgaMIBGroups 1 }

cgaRemoteGroup OBJECT-GROUP
 OBJECTS {
 cgaRemoteModifier, cgaRemoteCollisionCount,
 cgaRemotePublicKey, cgaRemoteExtensionFields,
 cgaRemoteCreated }


```
STATUS current
DESCRIPTION
    "The group of the elements representing the components of
    the CGA Parameters data structure for remote nodes."
 ::= { cgaMIBGroups 2 }

END
```

5. Security Considerations

This document defines a MIB module which could be used to configure CGA local to a node, which provides address ownership capabilities. Since this configuration affects to the security services provided by other protocols (such as SEND or Shim6), access through a management protocol to this configuration data has to be carefully considered.

This document specifies two MODULE-COMPLIANCE statements, `cgaMIBFullCompliance` allowing read-create access to local CGA configuration, and `cgaMIBReadOnlyCompliance` allowing read-only access to local CGA configuration and (optionally) no access to the private key of the local CGA, `cgaLocalPrivateKey`. Therefore:

1. If read-only access is provided and `cgaLocalPrivateKey` is not-accessible, the information disclosed in the `cgaLocalTable` is the one provided by protocols using CGA to prove the identity of the node considered to other nodes communicating with it. An attacker could obtain in general this information by using a CGA-aware protocol to request the CGA of the node. However, filtering restrictions configured for these CGA-aware protocols may not be enforced in the same way at the management protocol. An additional concern is that an attacker could obtain the information about a CGA (or many CGAs) without knowing any (all) of them, since the attacker could use one of the addresses (may be even not a CGA) to retrieve information from all the CGAs of the node. In any case it must be noted that the information disclosed when this configuration is in use cannot be used to impersonate the identity of the node unless the CGA itself becomes vulnerable to factoring attacks, since the private key is not made available.
2. If read-only access is provided for all the objects of the `cgaLocalTable`, including the `cgaLocalPrivateKey` columnar object, higher risks arise, since in this case any node accessing to this information could impersonate the node even if CGA-aware security protocols are used.
3. If read-create access is provided to the rows of the `cgaLocalTable`, besides the risks of accessing to `cgaLocalPrivateKey`, an attacker can delete or disable the entry associated to a CGA to prevent the node to benefit from the

authentication facilities provided by the combination of the CGA addresses and CGA-aware protocols. New CGAs can be introduced in the node, either to impersonate other nodes or to exhaust the resources of the node.

The risks associated to the last two configuration scenarios are so high that the following statement is made: the access to the managed node SHOULD be as secure or more secure than the services which are provided by the CGA. Only authorized administrators SHOULD be allowed to configure a device.

The risks associated to the access to the `cgaRemoteTable` are similar to the first case described when discussing the access to `cgaLocalTable`.

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.

6. IANA Considerations

The MIB module in this document uses the following IANA-assigned OBJECT IDENTIFIER values recorded in the SMI Numbers registry:

Descriptor	OBJECT IDENTIFIER value
-----	-----
cga-MIB	{ mib-2 XXX }

Editor's Note (to be removed prior to publication): the IANA is

requested to assign a value for "XXX" under the 'mib-2' subtree and to record the assignment in the SMI Numbers registry. When the assignment has been made, the RFC Editor is asked to replace "XXX" (here and in the MIB module) with the assigned value and to remove this note.

7. Acknowledgements

The work of Alberto Garcia-Martinez was supported in part by T2C2 project (TIN2008-06739-C04-01, granted by the Spanish Science and Innovation Ministry).

The authors would like to thank Suresh Krishnan for reviewing the document.

8. References

8.1. Normative References

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