SNMP MIB for TPM-Based Attestation

Specification Version 0.8
Revision 0.02
May 22, 2018
DRAFT

Contact: admin@trustedcomputinggroup.org

Work in Progress
This document is an intermediate draft for comment only and is subject to change without notice. Readers should not design products based on this document.
Disclaimers, Notices, and License Terms

THIS SPECIFICATION IS PROVIDED "AS IS" WITH NO WARRANTIES WHATSOEVER, INCLUDING ANY WARRANTY OF MERCHANTABILITY, NONINFRINGEMENT, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY WARRANTY OTHERWISE ARISING OUT OF ANY PROPOSAL, SPECIFICATION OR SAMPLE.

Without limitation, TCG disclaims all liability, including liability for infringement of any proprietary rights, relating to use of information in this specification and to the implementation of this specification, and TCG disclaims all liability for cost of procurement of substitute goods or services, lost profits, loss of use, loss of data or any incidental, consequential, direct, indirect, or special damages, whether under contract, tort, warranty or otherwise, arising in any way out of use or reliance upon this specification or any information herein.

This document is copyrighted by Trusted Computing Group (TCG), and no license, express or implied, is granted herein other than as follows: You may not copy or reproduce the document or distribute it to others without written permission from TCG, except that you may freely do so for the purposes of (a) examining or implementing TCG specifications or (b) developing, testing, or promoting information technology standards and best practices, so long as you distribute the document with these disclaimers, notices, and license terms.

Contact the Trusted Computing Group at www.trustedcomputinggroup.org for information on specification licensing through membership agreements.

Any marks and brands contained herein are the property of their respective owners.
1.1.1.1.1.1.1.1.1 Table of Contents

1.1.1.1.1.1.1.1 Table of Contents.................................................................iii

Scope 1

1.2 Key words........................................................................................................1
1.3 Informative vs Normative Text ................................................................. 1

2. References........................................................................................................2
2.1 Normative references....................................................................................2

3. Acronyms.........................................................................................................3

4. Conformance ..................................................................................................4
4.1 Introduction....................................................................................................4
4.2 SNMP Management - Normative ...............................................................4
4.3 Security Considerations .............................................................................4
4.3.1 Reconnaissance.......................................................................................4
4.3.2 SNMP.....................................................................................................4
4.3.3 Key Properties........................................................................................5
4.3.4 Legacy Compatibility............................................................................5

5. SNMP MIB Operation ..................................................................................6
5.1 MIB structure ..............................................................................................6
5.2 Example of Attestation with SNMP .........................................................7

6. SNMP MIB – Normative............................................................................10
Scope

1.2 Key words

The key words “MUST,” “MUST NOT,” “REQUIRED,” “SHALL,” “SHALL NOT,” “SHOULD,” “SHOULD NOT,” “RECOMMENDED,” “MAY,” and “OPTIONAL” in this document normative statements are to be interpreted as described in RFC-2119, Key words for use in RFCs to Indicate Requirement Levels.

1.3 Informative vs Normative Text

Normative text is specifically identified in this specification. A section marked as Normative is entirely Normative. If not marked Normative, the section is Informative.
2. References

2.1 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

2. IETF Standard 58 (STD58):
   a. RFC-2578, Structure of Management Information, v2 (SMIv2)
   b. RFC-2579, Textual Conventions for SMIv2
   c. RFC-2580, Conformance Statements for SMIv2
3. IETF RFC-6933, Entity MIB, Version 4
5. TPM Main Specification Revision 1.2, Part 1: Design Principles
6. TPM Main Specification Revision 1.2, Part 2: TPM Structures
7. TPM Main Specification Revision 1.2, Part 3: Commands
3. Acronyms

The table below describes the acronyms used in this specification.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNMP</td>
<td>Simple Network Management Protocol [2a][2b][2c]</td>
</tr>
<tr>
<td>MIB</td>
<td>Management Information Base, the standard data object and behavior description for SNMP</td>
</tr>
<tr>
<td>DevID</td>
<td>Device Identity, an IEEE 802.1AR Secure Device Identifier.</td>
</tr>
<tr>
<td>IDevID</td>
<td>An Initial DevID, assigned to the device by the OEM during production</td>
</tr>
<tr>
<td>LDevID</td>
<td>A Local DevID, assigned to the device by the user or administrator</td>
</tr>
<tr>
<td>OEM</td>
<td>Original Equipment Manufacturer</td>
</tr>
</tbody>
</table>
4. Conformance

4.1 Introduction

SNMP is an established network management protocol and method. While new methods and protocols are becoming more widely adopted, many networking equipment manufacturers and their customers have SNMP based management implemented. SNMP is therefore a good protocol for enabling the manufacturer, integrator, developer and customer community to gain experience with attestation as part of managing networking infrastructure.

4.2 SNMP Management - Normative

The SNMP Management Framework is described in IETF RFC documents, particularly Standard 58.

Managed objects are described via a Management Information Base or MIB, with MIB objects accessed through the Simple Network Management Protocol (SNMP) using the Object Identifiers defined in the MIB. Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information, version 2 (SMIv2).

This specification specifies a MIB module compliant with IETF standards as described in RFC 2578 and RFC 2579.

This specification is intended to interoperate with RFC 6933 (the Entity MIB) to allow attestation of devices, known as Composite Devices, that enclose multiple TPMs or multiple sub-devices, each with their own TPM. Such a composite device is not described explicitly in this specification. The MIB and operations specified here are structured to allow forms of composition as described in the entity MIB. Composite devices MUST implement the Entity MIB as described in RFC 6933 or later.

4.3 Security Considerations

4.3.1 Reconnaissance

The MIB provides for sending an SNMP notification when an attestation sequence is started. This is useful for identifying attestation performed with the intent of reconnaissance and should therefore be enabled in most deployments. The agent receiving the notification should monitor for use of attestation by unauthorized managers.

4.3.2 SNMP

SNMP by its nature is susceptible to several attacks. Mitigating SNMP attacks is outside the scope of this specification. For privacy and to provide authentication, use of SNMPv3 with AES encryption or SNMP over TLS are recommended.

The nature of TPM-based attestation data described here mitigates the risk of network spoofing or replays of SNMP data to a management entity or verifier.
4.3.3 Key Properties

Keys and certificates are specified elsewhere [1] and are outside the scope of this MIB. The user should be aware that attacks exist that use signing operations to break use of the same key for decryption. Further, a key that can be used for both signing and decryption cannot be a TPM restricted key—so it cannot be used to sign TPM2 internal data. For these reasons, a combined signing and decryption key is strongly discouraged.

To perform attestation with a TPM, an attestation key is required. An attestation key can signed certain data held internally by the TPM.

4.3.4 Legacy Compatibility

SHA-1 is obsolete and is included in the MIB only for compatibility with existing TPM 1.2 implementations that do not have SHA-2 capability. This MIB provides a SHA-1 option for tcgTpmQuoteDigestSelector, which is to be used only by those systems that have no SHA-2 or other hash available.
5. SNMP MIB Operation

5.1 MIB structure

The following MIB tree diagram provides a graphical overview of the MIB.
5.2 Example of Attestation with SNMP

SNMP operates on conceptual rows and columns, much like a row of a spreadsheet. More than one read or write operation may be required to retrieve or form one conceptual row. The MIB describes the row and column elements and their operations.

Devices with more than one TPM, known as Composite Devices, will require multiple attestations in order to assess the complete state of the device. It is expected that composite devices will implement the Entity MIB as needed to determine which TPM is to be selected for attestation.

The general attestation method is to first attest the main or current management interface and then use that interface for access to other devices within the system. As the internal interconnection topology is device specific, a detailed description of using of the Entity MIB is not described here.

A remote management entity may use this MIB to perform attestation using the following procedure:

1. Using the \texttt{tcgTpmSelector} value, read the \texttt{tcgTpmSelectorEntry}. This will provide information about the TPM that is required to interpret some of the responses to follow.

2. Check the local certificate cache to determine whether retrieving device certificates from the managed device is required. If certificate retrieval is required, use the \texttt{tcgTpmQuoteCertTable}. \textbf{Use the columns} \texttt{tcgTpmQuoteCertTpmSelector}, \texttt{tcgQuoteCertChainIndex}, \texttt{tcgQuoteCertType} and \texttt{tcgQuoteCertFragmentIndex} to read certificates from the remote device.
   
a. The \texttt{tcgTpmQuoteCertTpmSelector} is the same value as the \texttt{tcgTpmSelector}.

b. The \texttt{tcgQuoteCertType} selects which certificate chain is of interest. Permitted values are specified by the \texttt{CertType textual convention}.

c. \texttt{tcgQuoteCertChainIndex} selects the certificate of interest within a particular chain.

d. \texttt{tcgQuoteCertFragmentIndex} selects a fragment index (or “window” index) into the certificate to permit retrieval of certificates larger than the transport buffer (window) size.

Iterate through the retrieval commands until all required certificates have been retrieved. Note that full retrieval normally needs to be performed only if the device is new on the network.

3. Before retrieving a signed quote from the TPM, a mutual exclusion lock must first be obtained. To get the mutual exclusion lock, perform a GET of the \texttt{tcgTpmQuoteLockTable}, specifying the TPM to be locked with the \texttt{tcgTpmQuoteLockTpmSelector}. The value returned in \texttt{tcgTpmQuoteTpmLockVal} provides a period of exclusion to perform a Quote operation.

This lock will expire at the earlier of 1) timer expiration or 2) quote read completion.

4. To perform the TPM Quote, read the \texttt{tcgTpmQuoteEntry}. Each read request includes more index (selector) values to fill in the conceptual table row. Columns to be filled are the read-write data in the MIB row:
   - \texttt{tcgTpmQuoteTpmSelector}
   - \texttt{tcgTpmQuoteLockValue}
The first read operation may include as many of the read-write (“Index”) column data values as will fit in a single PDU and must provide a RowStatus of Create-And-Wait. The SNMP agent will reply with RowStatus set to Not-ready. Once all read-write column data has been provided to the row, the agent will return the read-only data with a RowStatus of Active. If the read-only data will not fit into one PDU, subsets of the columns may be iteratively read until all columns have been retrieved.

After successfully reading the read-only column data, the SNMP manager writes a row-status of Not-in-service. This cancels the mutex lock and allows the SNMP agent to recover resources. If the quote operation does not complete within the timeout period, the SNMP agent will likewise set the RowStatus to Not-in-service and recover resources.

**READ-WRITE Columns**

a. The `tcgTpmQuoteTpmSelector` is as above.

b. The `tcgQuoteLockValue` was retrieved in step 3.

c. The `tcgTpmQuoteCertSelector` is used to select a key to sign the Quote. Use the value corresponding to the `tcgTpmQuoteCertType` desired.

d. The `tcgTpmQuoteReqType` is described in the MIB.

e. The `tcgTpmQuoteNonce` is a random value selected by the requestor and included in the signature as determined by the TPM specification. This nonce proves freshness of the response so care must be exercised in preventing nonce re-use or nonce predictability.

f. `tcgTpmQuoteDigestSelector` is the signature digest to be used. The permitted values differ by TPM version and described in the TpmDigestAlgo textual convention description.

g. The `tcgTpmQuotePcrSelector` tells the TPM what PCRs to include in the quote. The permitted values are described in the MIB.

h. RowStatus, which is used as described above.

**READ-ONLY Columns**

a. `tcgTpmQuoteRespType` is returned to inform the SNMP manager how to interpret the response.

b. `tcgTpmQuoteQualifiedSigner` is empty for TPM 1.2. For TPM 2, it’s the TPMU_NAME qualified name of the key used for the quote signature.

c. `tcgTpmQuoteClockInfo` is empty for TPM 1.2. For TPM 2, the current TPMS_CLOCK_INFO structure is returned.

d. `tcgTpmQuoteFirmwareVersion` is the TPM firmware version.

e. `tcgTpmQuote` is the signed quote response for Quote (and Quote2) responses. This column is empty for AuditSessionQuote types.

f. `tcgTpmQuoteLogFileLines` returns the number of lines (entries) in a AuditSessionQuote log. For Quote and Quote2 responses, the value is 0.

g. `tcgTpmQuotePCRDigest` is an untrusted digest, included for diagnostic purposes.
5. Retrieve the event log by using the tcgTpmQuoteLogTable, using the following columns iterates through the log.

- tcgTpmQuoteCertTpmSelector
- tcgTpmQuoteLogSelector
- tcgTpmQuoteLogLineNumber
- tcgTpmQuoteLogFragmentIndex

Note that by caching the log from one query to the next, the attestation verifier (SNMP Manager) can start with the previous tcgTpmQuoteLogLineNumber+1 as a check for whether there are new entries in the log to be retrieved.

a. The tcgTpmQuoteCertTpmSelector is the same value as in step 3, above.

b. The tcgTpmQuoteLogSelector selects from the logs that may be available on the remote device.

c. The tcgTpmQuoteLogLineNumber is the line of the log file to be retrieved.

d. The one-based tcgTpmQuoteLogFragmentIndex selects a fragment index (or “window” index) into the selected log line.

e. tcgTpmQuoteLogLineBuf is the log entry payload.

f. tcgTpmQuoteLogStatus is RowStatus for the current row (line) entry.

6. Parse the log file and check recalculated PCR values against the returned Quote.
6. SNMP MIB – Normative

--
-- CERTTPM-MIB
-- MIB generated by MG-SOFT Visual MIB Builder
--

CERTTPM-MIB DEFINITIONS ::= BEGIN
IMPORTS
InetAddressType, InetAddress
FROM INET-ADDRESS-MIB
SnmpAdminString
FROM SNMP-FRAMEWORK-MIB
OBJECT-GROUP, NOTIFICATION-GROUP
FROM SNMPv2-CONF
internet, Integer32, Counter32, BITS, OBJECT-TYPE,
MODULE-IDENTITY, NOTIFICATION-TYPE
FROM SNMPv2-SMI
RowStatus, DisplayString, TEXTUAL-CONVENTION
FROM SNMPv2-TC;

-- 1.3.6.1.4.1.21911.1.1
tcgTpmQuoteMIB MODULE-IDENTITY
LAST-UPDATED "201805070000Z" -- May 07, 2018 at 00:00 GMT
ORGANIZATION
"Trusted Computing Group,
Embedded Systems Workgroup,
Networking Equipment Subgroup"
CONTACT-INFO
"Admin@trustedcomputinggroup.org
neteq-chair@trustedcomputinggroup.org"
DESCRIPTION
"The MIB module for retrieving attestation information from
a device, including the boot integrity measurement log
and a TPM quote."
::= { tcgMibs 1 }

--
-- Textual conventions
--

TpmDigestAlgo ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"The tcgTpmQuotePCRDigest algorithm.

Note that SHA-1 is obsolete and is included here only for
compatibility with existing TPM 1.2 implementations that
do not have SHA-2 capability.

Implementations that have SHA-2 capability MUST NOT
support SHA-1.

Digests and values listed match the TPM Algorithm
registry and are current as of January 18, 2018."

SYNTAX INTEGER
{ noDigest(1),
  tpmDigestSHA1(2),
  tpmDigestSHA2256(3),
  tpmDigestSHA2384(4),
  tpmDigestSHA2512(5),
  tpmDigestSM3256(6),}
TpmQuoteClockInfo ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION
  "Syntax for ClockInfo in a TPM Quote.
  TPM 1.2 will have size 0.
  TPM 2 will have size 17."
  SYNTAX INTEGER (0 | 17)

TpmQuoteFwVersion ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION
  "TPM firmware version field."
  SYNTAX INTEGER (0 | 8)

TpmQuoteQualifiedSigner ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION
  "Syntax for tcgTpmQuoteQualifiedSigner."
  SYNTAX INTEGER (0 | 66)

TcgTpmLogFile ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION
  "Limit log file lines to positive Integer32 value."
  SYNTAX Integer32 (0..2147483647)

CertType ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION
  "Key and certificate creation is outside the scope of this
  MIB. Refer to the Security Considerations for this MIB
  and to TCG DevID specifications for further information.

  CertType encodes the way in which a configured
  certificate will be used.

  A leaf certificate does not have the intermediate or
  root bits set.

  Non-leaf certificates should indicate only intermediate
  or root status.

  The CertType for leaf certificate may have multiple bits
  set in cases where the same certificate will be used in
  multiple cases or situations.

  Certificate chains are to be verified using
  authority/subject key identifiers only. Refer to
  RFC-5280 for required certificate path validation
  algorithms.

  A self-signed certificate cannot convey identity,
  so may not have any other bit set."
  SYNTAX BITS
  {
    selfSigned(0),
    tpmEndorsement(1),
    initialDevID(2),
    initialAttestation(3),
    initialEncrypting(4),
    initialCombinedEncryptingSign(5),
    localDevID(6),
    localAttestation(7),
    localEncrypting(8),
    localCombinedEncryptingSign(9),

    tpmDigestSHA3256(7),
    tpmDigestSHA3384(8),
    tpmDigestSHA3512(9)
  }
localSpecific (10),
intermediate (11),
root (12)
}

QuoteReqType ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"The type of attestation requested.
TPM 1.2 always uses TpmQuoteReq (1). Response tctTpmQuoteRespType
will be either TpmQuote or TpmQuote2 depending on system
capability.
For TPM 2, either TpmQuoteReq or TpmAuditSessionQuoteReq (2)
may be used. QuoteReq requests a TPM2_Quote operation, while
AuditSessionQuoteReq requests an audit session to be used
as a quote."
SYNTAX INTEGER
{ tpmQuoteReq (1),
tpmAuditSessionQuoteReq (2) }

QuoteRespType ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"This indicates the quote type returned by quote/attestation
request."
SYNTAX INTEGER
{ tpm12QuoteResp (1),
tpm12Quote2Resp (2),
tpm20QuoteResp (3),
tpm2AuditSessionQuoteResp (4) }

PhysicalIndex ::= TEXTUAL-CONVENTION
DISPLAY-HINT
"d"
STATUS current
DESCRIPTION
"An arbitrary value that uniquely identifies the physical
entity. The value should be a small positive integer.
Index values for different physical entities are not
necessarily contiguous."
SYNTAX Integer32 (1..2147483647)

--
-- Node definitions
--

-- 1.3.6.1.4
private OBJECT IDENTIFIER ::= { internet 4 }

-- 1.3.6.1.4.1
enterprise OBJECT IDENTIFIER ::= { private 1 }

-- 1.3.6.1.4.1.21911
tcg OBJECT IDENTIFIER ::= { enterprise 21911 }

-- 1.3.6.1.4.1.21911.1
tcgMibs OBJECT IDENTIFIER ::= { tcg 1 }

-- 1.3.6.1.4.1.21911.1.1
tcgTpmQuoteMIB OBJECT IDENTIFIER ::= { tcgMibs 1 }
-- 1.3.6.1.4.1.21911.1.1.1
tcgQuoteMibVersions OBJECT IDENTIFIER ::= { tcgTpmQuoteMIB 1 }

-- 1.3.6.1.4.1.21911.1.1.1.1
tcgTpmQuoteMibVerBase OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Number base (radix) for version reporting. This object must remain the first object in this OID tree."
 ::= { tcgQuoteMibVersions 1 }

-- 1.3.6.1.4.1.21911.1.1.1.2
tcgTpmQuoteMibVersion OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The MIB version supported by the device. The version is to be updated when items are added or deprecated in this MIB. This object must remain the second object in this OID tree."
 ::= { tcgQuoteMibVersions 2 }

-- MIB version reported in the base specified by tcgTpmQuoteMibVerBase.
-- Version 1 of this MIB corresponds to the first TCG release.

-- 1.3.6.1.4.1.21911.1.1.1.3
tcgTpmQuoteMibGeneralVersionInfo OBJECT-TYPE
SYNTAX SnmpAdminString (SIZE (0..160))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"A text string identifying the device, including model and software version."
 ::= { tcgQuoteMibVersions 3 }

-- Notifications are an optional feature of this MIB.
-- As some uses of notifications may support security risk management,
-- control of notifications is not provided in this MIB.

-- 1.3.6.1.4.1.21911.1.1.2
tcgTpmQuoteNotify OBJECT IDENTIFIER ::= { tcgTpmQuoteMIB 2 }

-- 1.3.6.1.4.1.21911.1.1.2.1
tcgTpmQuoteNotificationData OBJECT IDENTIFIER ::= { tcgTpmQuoteNotify 1 }

-- 1.3.6.1.4.1.21911.1.1.2.1.1
tcgTpmQuoteLockHolderIpAddrType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS accessible-for-notify
STATUS current
DESCRIPTION
"The InetAddress type of an entity requesting a TpmQuoteTable lock."
 ::= { tcgTpmQuoteNotificationData 1 }

-- 1.3.6.1.4.1.21911.1.1.2.1.2
tcgTpmQuoteLockHolderIpAddress OBJECT-TYPE
SYNTAX InetAddress
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The InetAddress of an entity requesting a TpmQuoteTable lock."
 ::= { tcgTpmQuoteNotificationData 2 }
"The Inet Address of an entity requesting a TpmQuoteTable lock."
::= { tcgTpmQuoteNotificationData 2 }

-- 1.3.6.1.4.1.21911.1.1.2.2

tcgTpmQuoteNotifications OBJECT IDENTIFIER ::= { tcgTpmQuoteNotify 2 }

-- 1.3.6.1.4.1.21911.1.1.2.2.1

tcgTpmQuoteLockNotification NOTIFICATION-TYPE
OBJECTS { tcgTpmQuoteLockHolderIpAddrType, tcgTpmQuoteLockHolderIpAddress }
STATUS current
DESCRIPTION "Notification sent when a new TPM quote lock row is created."
::= { tcgTpmQuoteNotifications 1 }

-- 1.3.6.1.4.1.21911.1.1.3

tcgTpmSelectors OBJECT IDENTIFIER ::= { tcgTpmQuoteMIB 3 }

-- 1.3.6.1.4.1.21911.1.1.3.1

tcgTpmSelectorTable OBJECT-TYPE
SYNTAX SEQUENCE OF TcgTpmSelectorEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "This table lists all TPMs reachable by the SNMP agent.
On composite platforms (where the entity MIB is implemented)
the tcgTpmSelector index returned will match entries in
entPhysicalIndex. This allows correlation of the attestations
provided by this interface to the physical devices
described in the entity MIB.
The reported selectorIndex on each row is used when
accessing the tcgTpmQuoteCertTable, the tctTpmQuoteTable
and the tcgTpmQuoteLogTable.
As stated in the Entity MIB (RFC 6933), physicalIndex
values are not necessarily contiguous.
When the entity MIB is not implemented on the platform,
the first selector returned will always be the active
management CPU/TPM instance."
::= { tcgTpmSelectors 1 }

-- 1.3.6.1.4.1.21911.1.1.3.1.1

tcgTpmSelectorEntry OBJECT-TYPE
SYNTAX TcgTpmSelectorEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The details pertaining to a specific TPM."
INDEX { tcgTpmSelector }
::= { tcgTpmSelectorTable 1 }

TcgTpmSelectorEntry ::= SEQUENCE {
tcgTpmSelector
    PhysicalIndex,
tcgTpmClass
    INTEGER,
tcgTpmSpecRev
    Integer32,
tcgTpmSelectorDescription
    SnmpAdminString,
tcgTpmFirmwareVersion

...
OCTET STRING
}

-- 1.3.6.1.4.1.21911.1.1.3.1.1.1
tcgTpmSelector OBJECT-TYPE
SYNTAX PhysicalIndex
MAX-ACCESS accessible-for-notify
STATUS current
DESCRIPTION "This table lists all TPMs reachable by the SNMP agent.
On platforms where the entity MIB is implemented, the
tcgTpmSelector index returned will match entries in
tcgmMIB::entPhysicalIndex. This allows correlation of the
attestations provided by this interface to the
physical devices described in the entity MIB.
The reported selectorIndex on each row is used when
accessing the tcgmMIB::tcgTpmQuoteCertTable, the
tcgmMIB::tctTpmQuoteTable and the tcgmMIB::tcgTpmQuoteLogTable.
When the entity MIB is not implemented on the platform,
the first selector returned must always be the active
management CPU/TPM instance."
REFERENCE "Refer to tcgmMIB::entPhysicalIndex in the entity MIB (RFC-6933)."
 ::= { tcgTpmSelectorEntry 1 }

-- 1.3.6.1.4.1.21911.1.1.3.1.1.2
tcgTpmClass OBJECT-TYPE
SYNTAX INTEGER
{ tpm12(1),
  tpm20(2) }
MAX-ACCESS read-only
STATUS current
DESCRIPTION "TPM generation (i.e., family)"
 ::= { tcgTpmSelectorEntry 2 }

-- 1.3.6.1.4.1.21911.1.1.3.1.1.3
tcgTpmSpecRev OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "When not available, a value of 0 must be returned."
 ::= { tcgTpmSelectorEntry 3 }

-- 1.3.6.1.4.1.21911.1.1.3.1.1.4
tcgTpmSelectorDescription OBJECT-TYPE
SYNTAX SnmpAdminString (SIZE (0..128))
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Printable ASCII string describing the module or device
with the TPM. This string must begin with a
manufacturer-specific model number of the device
containing the TPM. Use of IDevID identity is
recommended."
 ::= { tcgTpmSelectorEntry 4 }

-- 1.3.6.1.4.1.21911.1.1.3.1.1.5
tcgTpmFirmwareVersion OBJECT-TYPE
SYNTAX OCTET STRING (SIZE (8))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The firmwareVersion object is a 64 bit integer encoded in
network order specifying the TPM-vendor specific version
number.
For a TPM 1.2 this field is the value reported by the TPM,
or 0 if there is no accessible value."
::= { tcgTpmSelectorEntry 5 }

-- 1.3.6.1.4.1.21911.1.1.4
tcgTpmQuoteLocks OBJECT IDENTIFIER ::= { tcgTpmQuoteMIB 4 }

-- 1.3.6.1.4.1.21911.1.1.4.1
tcgTpmQuoteLockTable OBJECT-TYPE
SYNTAX SEQUENCE OF TcgTpmQuoteLockEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This one row table creates a simple mutex for attestation."
::= { tcgTpmQuoteLocks 1 }

-- 1.3.6.1.4.1.21911.1.1.4.1.1
tcgTpmQuoteLockEntry OBJECT-TYPE
SYNTAX TcgTpmQuoteLockEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This table may have at most one active row at a time. The
row is created on read and exists until expiration of
the timeout value or completion of a tcgTpmQuoteTable
read sequence.
A subsequent read while the lock is active must not return
the tcgTpmQuoteTpmLockVal currently in use. In such a
case, the operation may fail or return zero for the lock
value."
INDEX { tcgTpmQuoteLockTpmSelector }
::= { tcgTpmQuoteLockTable 1 }

TcgTpmQuoteLockEntry ::= SEQUENCE {
tcgTpmQuoteLockTpmSelector PhysicalIndex,
tcgTpmQuoteTpmLockVal Integer32,
tcgTpmQuoteLockTimeout Integer32 }
DESCRIPTION

"Reading this value returns a random number (a non-negative INTEGER32) to use when reading the tcgTpmQuoteTable and also sets and starts a timer. The starting value of this timer (in seconds) is returned in tcgTpmQuoteLockTimeout. The caller will be allowed to use the random value as a key to read the tcgTpmQuoteTable table until the read has been completed or the timer expires.

tcgTpmQuoteLockNotification may optionally be sent in response to reading this object."

::= { tcgTpmQuoteLockEntry 2 }

-- 1.3.6.1.4.1.21911.1.1.4.1.1.3
tcgTpmQuoteLockTimeout OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This is the length of time, in seconds, before the tcgTpmQuoteLockVal mutex expires. The value of the timer is set by device firmware and is not writable via SNMP."

::= { tcgTpmQuoteLockEntry 3 }

-- 1.3.6.1.4.1.21911.1.1.5
tcgTpmQuoteObjects OBJECT IDENTIFIER ::= { tcgTpmQuoteMIB 5 }

-- 1.3.6.1.4.1.21911.1.1.5.1
tcgTpmQuoteCertTable OBJECT-TYPE
SYNTAX SEQUENCE OF TcgTpmQuoteCertEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A table containing certificates. Certs must be parsable by the attestation verifier. All certs are transferred in DER (wire) format."

::= { tcgTpmQuoteObjects 1 }

-- 1.3.6.1.4.1.21911.1.1.5.1.1
tcgTpmQuoteCertEntry OBJECT-TYPE
SYNTAX TcgTpmQuoteCertEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A table for reading certificates from the managed device. All certs are transferred in DER format."

INDEX { tcgTpmQuoteCertTpmSelector }

::= { tcgTpmQuoteCertTable 1 }

TcgTpmQuoteCertEntry ::= SEQUENCE |
  tcgTpmQuoteCertTpmSelector
  PhysicalIndex |
  tcgTpmQuoteCertChainIndex
  Integer32 |
  tcgTpmQuoteCertType
  CertType |
  tcgTpmQuoteCertFragmentIndex
  Integer32 |
  tcgTpmQuoteCertBuf
  OCTET STRING |
  tcgTpmQuoteCertStatus
  RowStatus 
-- 1.3.6.1.4.1.21911.1.1.5.1.1.1
tcgTpmQuoteCertTpmSelector OBJECT-TYPE
SYNTAX PhysicalIndex
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The value used is determined from reading the
tcgTpmSelectorTable."
 ::= { tcgTpmQuoteCertEntry 1 }

-- 1.3.6.1.4.1.21911.1.1.5.1.1.2
tcgTpmQuoteCertChainIndex OBJECT-TYPE
SYNTAX Integer32 (1..16)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"A device may have multiple certificates associated with each
TPM. This index selects from among configured certificate
certains. The CertType response indicates the application of
the cert chain returned. Chain indices are an uninterrupted
sequence. For each TPM and Chain Index, there may be zero
or more certificates available.

A value of 1 specifies the leaf certificate, with the value
increasing in the chain toward the root."
 ::= { tcgTpmQuoteCertEntry 2 }

-- The number of accessible elements is determined by the value of the related CertChainCount value.

-- 1.3.6.1.4.1.21911.1.1.5.1.1.3
tcgTpmQuoteCertType OBJECT-TYPE
SYNTAX CertType
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"An index for the type of certificate to be read.
Refer to the CertType textual convention in this MIB."
 ::= { tcgTpmQuoteCertEntry 3 }

-- 1.3.6.1.4.1.21911.1.1.5.1.1.4
tcgTpmQuoteCertFragmentIndex OBJECT-TYPE
SYNTAX Integer32 (1..32)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Certificates may be larger in size than can be carried by
a single UDP packet. This interface divides each
certificate into a sequence of max 484-byte buffers. The
index (in 484 byte increments) of the certificate
fragment is specified in tcgQuoteCertFragmentIndex."
 ::= { tcgTpmQuoteCertEntry 4 }

-- 1.3.6.1.4.1.21911.1.1.5.1.1.5
tcgTpmQuoteCertBuf OBJECT-TYPE
SYNTAX OCTET STRING (SIZE (1..484))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"A buffer containing (a portion of) a certificate."
 ::= { tcgTpmQuoteCertEntry 5 }

-- 1.3.6.1.4.1.21911.1.1.5.1.1.6
tcgTpmQuoteCertStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The row status for the cert row. To perform a cert read operation:
- write the tctTpmQuoteCertTpmSelector value, setting row status to 'createAndWait'
- write each of the read-write column variables to select the desired certificate window parameters.
- once writable columns are configured, set row status to 'active'.
- read the row to get the read-only buffer value
- iterate through the chain indeces, cert type and fragment indeces as needed until required certificates have been retrieved.
- when complete, set row status to 'notInService'.'

 ::= { tcgTpmQuoteCertEntry 6 }

-- 1.3.6.1.4.1.21911.1.1.5.2
tcgTpmQuoteTable OBJECT-TYPE
SYNTAX SEQUENCE OF TcgTpmQuoteEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "A table for attestation."
 ::= { tcgTpmQuoteObjects 2 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1
tcgTpmQuoteEntry OBJECT-TYPE
SYNTAX TcgTpmQuoteEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "An entry of the quote Table."
INDEX { tcgTpmQuoteTpmSelector, tcgTpmQuoteLockValue }
 ::= { tcgTpmQuoteTable 1 }

TcgTpmQuoteEntry ::= SEQUENCE {
tcgTpmQuoteTpmSelector
  PhysicalIndex,
tcgTpmQuoteLockValue
  Integer32,
tcgTpmQuoteCertSelector
  Integer32,
tcgTpmQuoteReqType
  QuoteReqType,
tcgTpmQuoteNonce
  OCTET STRING,
tcgTpmQuoteDigestSelector
  TpmDigestAlgo,
tcgTpmQuotePcrSelector
  OCTET STRING,
tcgTpmQuotePCRDigestAlg
  Integer32,
tcgTpmQuoteRespType
  QuoteRespType,
tcgTpmQuoteQualifiedSigner
  TpmQuoteQualifiedSigner,
tcgTpmQuoteClockInfo
  TpmQuoteClockInfo,
tcgTpmQuoteFirmwareVersion
  TpmQuoteFwVersion,
tcgTpmQuote
  OCTET STRING,
tcgTpmQuoteLogFileLines
  TcgTpmLogFile,
tcgTpmQuotePCRDigest
  OCTET STRING,
tcgTpmQuoteRowStatus
RowStatus

-- 1.3.6.1.4.1.21911.1.1.5.2.1.1
tcgTpmQuoteTpmSelector OBJECT-TYPE
SYNTAX PhysicalIndex
MAX-ACCESS read-write
STATUS current
DESCRIPTION "The TPM to access for Quote operation. A value of one (1) selects the TPM associated with the local CPU. Any other selector value is determined by the management entity after retrieving the tcgTpmSelectorTable."
::= { tcgTpmQuoteEntry 1 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.2
tcgTpmQuoteLockValue OBJECT-TYPE
SYNTAX Integer32 (1..2147483647)
MAX-ACCESS read-write
STATUS current
DESCRIPTION "The value read from tcgTpmQuoteTableLock is used as a key to allow access to the QuoteEntry row. The value read from tcgTpmQuoteTableLock may be used once to read tcgTpmQuoteEntry, which must occur before the tcgTpmQuoteTableLock timeout expires.

The SNMP agent receives data with an incorrect tcgTpmQuoteLockValue, the data is to be discarded without any effect on the current row."
::= { tcgTpmQuoteEntry 2 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.3
tcgTpmQuoteCertSelector OBJECT-TYPE
SYNTAX Integer32 (1..16)
MAX-ACCESS read-write
STATUS current
DESCRIPTION "This is the cert chain (as reported by tcgTpmQuoteCertChainIndex) to use in performing the TPM quote operation. This selection must include a certificate with the InitialAttestation, LocalAttestation or LocalSpecific CertType."
::= { tcgTpmQuoteEntry 3 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.4
tcgTpmQuoteReqType OBJECT-TYPE
SYNTAX QuoteReqType
MAX-ACCESS read-write
STATUS current
DESCRIPTION "Type of attestation requested. Refer to QuoteReqType textual convention description."
::= { tcgTpmQuoteEntry 4 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.5
tcgTpmQuoteNonce OBJECT-TYPE
SYNTAX OCTET STRING (SIZE (20..64))
MAX-ACCESS read-write
STATUS current
DESCRIPTION "The nonce to use when requesting a Quote from the selected TPM.
- For TPM 1.2, the nonce size is 160 bits.
- For TPM 2.0, the nonce size matches the size of the digest to be used."
::= { tcgTpmQuoteEntry 5 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.6

tcgTpmQuoteDigestSelector OBJECT-TYPE
SYNTAX TpmDigestAlgo
MAX-ACCESS read-write
STATUS current
DESCRIPTION
   "A selector for the tcgTpmQuotePCRDigest algorithm."
 ::= { tcgTpmQuoteEntry 6 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.7

tcgTpmQuotePcrSelector OBJECT-TYPE
SYNTAX OCTET STRING (SIZE (4))
MAX-ACCESS read-write
STATUS current
DESCRIPTION
   "This is a bitmask to select PCR registers in the TPM for
   inclusion in the Quote response. Size is always 4 octets.
   These 4 octets are right-aligned to the bitmask supplied
   to a TPM, with PCR 0 represented with the right-most
   (lowest order) bit."
REFERENCE
   "TPM class is returned in the tcgTpmSelectorEntry table.

   TPM 1.2 PCRs are selected as defined in TCG TPM 1.2 Part 2,
   Section 8.1 (TPM_PCR_SELECTION)

   TPM 2.0 PCRs are selected as defined in TCG TPM 2.0 Library
   Specification, Part 2, Section 10.6.1 (PMS_PCR_SELECT)."
 ::= { tcgTpmQuoteEntry 7 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.8

tcgTpmQuotePCRDigestAlg OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-write
STATUS current
DESCRIPTION
   "This object is of TPM 2.0 type TPM_ALG_ID, contained within
   a 32-bit TPM_ALGORITHM_ID, which defines the hash algorithm
   used to compute the PCR digest.

   For TPM 1.2, the value is set as appropriate for the
   algorithm in use."
REFERENCE
   "Refer to TPM 2.0 Library Specification, Part 2, Section
   6.3 for the definition of TPM_ALG_ID. TPM_ALGORITHM_ID
   is specified in the TCG Algorithms Registry."
 ::= { tcgTpmQuoteEntry 8 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.9

tcgTpmQuoteRespType OBJECT-TYPE
SYNTAX QuoteRespType
MAX-ACCESS read-only
STATUS current
DESCRIPTION
   "The TPM quote type returned.

   When a Tpm2SessionQuote type is returned, the session audit
   log must be read from the tcgTpmQuoteLogEntry table."
REFERENCE
   "Refer to tcgTpmQuote description."
 ::= { tcgTpmQuoteEntry 9 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.10
tcgTpmQuoteQualifiedSigner OBJECT-TYPE
SYNTAX TpmQuoteQualifiedSigner
MAX-ACCESS read-only
STATUS current
DESCRIPTION "For a TPM 1.2 this field is empty.

The qualifiedSigner object is of TPM 2.0 type TPMU_NAME and designates the qualified name of the public key used for the quote signature.

The TPMU_NAME is a digest described in TPM 2. It consists of the 16 bit TPM_ALG_ID encoded in network order of the name hash algorithm used to generate the digest of the public key, followed by the public key digest itself."

REFERENCE "TPM2B_NAME structure."
::= { tcgTpmQuoteEntry 10 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.11
tcgTpmQuoteClockInfo OBJECT-TYPE
SYNTAX TpmQuoteClockInfo
MAX-ACCESS read-only
STATUS current
DESCRIPTION "For a TPM 1.2 this field is zero length.

The clockInfo object is of TPM 2.0 type TPMS_CLOCK_INFO and consists of the subfields Clock, ResetCount, RestartCount and Safe."

REFERENCE "TPMS_CLOCK_INFO is defined in TPM 2.0 Library Specification, Part 2, Section 10.11.1."
::= { tcgTpmQuoteEntry 11 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.12
tcgTpmQuoteFirmwareVersion OBJECT-TYPE
SYNTAX TpmQuoteFwVersion
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The firmwareVersion object is a 64 bit integer encoded in network order specifying the TPM-vendor specific version number.

For a TPM 1.2 this field is the value reported by the TPM, or empty if there is no accessible value.

This value is the same as that returned by tcgTpmFirmwareVersion."
::= { tcgTpmQuoteEntry 12 }

-- 1.3.6.1.4.1.21911.1.1.5.2.1.13
tcgTpmQuote OBJECT-TYPE
SYNTAX OCTET STRING (SIZE (0..484))
MAX-ACCESS read-only
STATUS current
DESCRIPTION "This object is retrieved in response to the requested Quote/Attest operation.

Note: The returned data has a different structure depending on the TPM class:

For TPM 1.2, the returned value is a TPM_QUOTE_INFO or a TPM_QUOTE2_INFO structure."
For TPM 2, the returned value depends on the TpmQuoteReqType. For a quote, the response is a TPMS_ATTEST structure. Note that a TPM2_Quote does not return the actual TPM PCR values.
For an AuditSessionQuote, this field is empty and the response is retrieved using the TpmQuoteLogTable.

REFERENCE
"TPM 1.2 Quote is defined in TPM 1.2 Main Part 3, Section 16.3. TPM 1.2 Quote2 is defined in TPM 1.2 Main Part 3, Section 16.5.

An overview of TPM 2.0 PCR selection is provided in the TPM 2.0 Library Specification, Section 17.5. Be aware of the race condition described in section 17.6.2 of the same document.

TPM2 Quote is defined in the TPM 2.0 Library Specification, Section 18.4."
SYNTAX SEQUENCE OF TcgTpmQuoteLogEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A table to return boot event log entries."
 ::= { tcgTpmQuoteObjects 3 }

1.3.6.1.4.1.21911.1.1.5.3.1
TcgTpmQuoteLogEntry OBJECT-TYPE
SYNTAX TcgTpmQuoteLogEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"An entry of the QuoteLog table. Each row in the table
 corresponds to one line of the selected quote event log."
INDEX { tcgTpmQuoteCertTpmSelector, tcgTpmQuoteSelector, tcgTpmQuoteLogLineNumber,
   tcgTpmQuoteLogFragmentIndex }
 ::= { tcgTpmQuoteLogTable 1 }

TcgTpmQuoteLogEntry ::= SEQUENCE {
   tcgTpmQuoteLogTpmSelector
   PhysicalIndex,
   tcgTpmQuoteLogSelector
   INTEGER,
   tcgTpmQuoteLogLineNumber
   TcgTpmLogFile,
   tcgTpmQuoteLogFragmentIndex
   Integer32,
   tcgTpmQuoteLogLineBuf
   OCTET STRING,
   tcgTpmQuoteLogStatus
   RowStatus
}

1.3.6.1.4.1.21911.1.1.5.3.1.1
TcgTpmQuoteLogTpmSelector OBJECT-TYPE
SYNTAX PhysicalIndex
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"A value of one (1) selects the TPM associated with the local
 CPU. Any other selector value is determined from reading
 the tcgTpmSelectorTable."
 ::= { tcgTpmQuoteLogEntry 1 }

1.3.6.1.4.1.21911.1.1.5.3.1.2
TcgTpmQuoteLogSelector OBJECT-TYPE
SYNTAX INTEGER
{ static(1),
   dynamic(2) }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Selects the static log or an implementation specific dynamic
 log. PCRs related to a static log are reset only at boot.
 PCRs related to a dynamic log may be reset more often, but
 this behavior is platform and application specific."
 ::= { tcgTpmQuoteLogEntry 2 }

1.3.6.1.4.1.21911.1.1.5.3.1.3
TcgTpmQuoteLogLineNumber OBJECT-TYPE
SYNTAX TcgTpmLogFile
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Each row in the table is one log entry. This object uniquely
identifies the row to be returned."
::= { tcgTpmQuoteLogEntry 3 }

-- 1.3.6.1.4.1.21911.1.1.5.3.1.4
tcgTpmQuoteLogFragmentIndex OBJECT-TYPE
SYNTAX Integer32 (1..6)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Log entries may be larger in size than can be carried by a
single UDP packet. This interface divides each log entry
into a sequence of max 484-byte buffers. The 1-based
index of the buffer is specified in
tcgTpmQuoteLogFragmentIndex."
::= { tcgTpmQuoteLogEntry 4 }

-- 1.3.6.1.4.1.21911.1.1.5.3.1.5
tcgTpmQuoteLogLineBuf OBJECT-TYPE
SYNTAX OCTET STRING (SIZE (0..484))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The returned event log entry."
::= { tcgTpmQuoteLogEntry 5 }

-- 1.3.6.1.4.1.21911.1.1.5.3.1.6
tcgTpmQuoteLogStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Status of the conceptual row."
::= { tcgTpmQuoteLogEntry 6 }

-- 1.3.6.1.4.1.21911.1.1.6
tcgTpmQuoteNotificationGroup NOTIFICATION-GROUP
NOTIFICATIONS { tcgTpmQuoteLockNotification }
STATUS current
DESCRIPTION
"Notification group."
::= { tcgTpmQuoteMIB 6 }

-- 1.3.6.1.4.1.21911.1.1.7
tcgTpmSelectionGroup OBJECT-GROUP
OBJECTS { tcgTpmSelector, tcgTpmSelectorDescription,
tcgTpmQuoteDigestSelector, tcgTpmQuoteLogSelector,
tcgTpmQuoteQualifiedSigner, tcgTpmQuotePCRDigestAlg,
tcgTpmQuoteTpmLockVal, tcgTpmQuoteLockTpmSelector,
tcgTpmQuotePcrSelector, tcgTpmQuoteCertTpmSelector,
tcgTpmQuoteLogTpmSelector, tcgTpmQuoteRespType, tcgTpmSpecRev, tcgTpmClass,

-- 1.3.6.1.4.1.21911.1.1.8
tcgTpmQuoteObjectGroup OBJECT-GROUP
OBJECTS { tcgTpmQuoteMibVersion, tcgTpmQuoteNonce, tcgTpmQuote,
tcgTpmQuoteLogLineNumber, tcgTpmQuoteLogFragmentIndex,
tcgTpmQuoteCertSelector, tcgTpmQuoteLockValue,
tcgTpmQuoteCertTpmSelector, tcgTpmQuoteLogTpmSelector, tcgTpmQuoteTpmSelector,
tcgTpmQuoteRespType, tcgTpmSpecRev, tcgTpmClass,
tcgTpmQuotePCRDigest, tcgTpmQuoteClockInfo, tcgTpmFirmwareVersion,
tcgTpmQuoteFirmwareVersion, tcgTpmQuoteReqType, tcgTpmQuoteLockTimeout,
tcgTpmQuoteTpmLockVal, tcgTpmQuoteRowStatus, tcgTpmQuoteLockHolderIpAddrType,
tcgTpmQuoteLockHolderIpAddress, tcgTpmQuoteCertChainIndex, tcgTpmQuoteCertType,
tcgTpmQuoteLogLineBuf, tcgTpmQuoteLogStatus, tcgTpmQuotePcrSelector,
tcgTpmQuoteCertFragmentIndex, tcgTpmQuoteCertBuf,
tcgTpmQuoteCertStatus, tcgTpmQuoteLogFileLines }

STATUS current
DESCRIPTION
"The group of objects required to support boot log and TPM
Quote retrieval."
::= { tcgTpmQuoteMIB 8 }

-- 1.3.6.1.4.1.21911.1.1.9
tcgTpmQuoteMibVersionGroup OBJECT-GROUP
    OBJECTS { tcgTpmQuoteMibVerBase, tcgTpmQuoteMibVersion,
              tcgTpmQuoteMibGeneralVersionInfo }
    STATUS current
    DESCRIPTION
    "Objects to support MIB version."
    ::= { tcgTpmQuoteMIB 9 }

END

--
-- CERTTPM-MIB
--