

# KMIP Tape Library Profile Version 1.0

## Committee Specification Draft 01

31 October 2013

### Specification URIs

#### This version:

<http://docs.oasis-open.org/kmip/kmip-tape-lib-profile/v1.0/csd01/kmip-tape-lib-profile-v1.0-csd01.doc> (Authoritative)  
<http://docs.oasis-open.org/kmip/kmip-tape-lib-profile/v1.0/csd01/kmip-tape-lib-profile-v1.0-csd01.html>  
<http://docs.oasis-open.org/kmip/kmip-tape-lib-profile/v1.0/csd01/kmip-tape-lib-profile-v1.0-csd01.pdf>

#### Previous version:

N/A

#### Latest version:

<http://docs.oasis-open.org/kmip/kmip-tape-lib-profile/v1.0/kmip-tape-lib-profile-v1.0.doc> (Authoritative)  
<http://docs.oasis-open.org/kmip/kmip-tape-lib-profile/v1.0/kmip-tape-lib-profile-v1.0.html>  
<http://docs.oasis-open.org/kmip/kmip-tape-lib-profile/v1.0/kmip-tape-lib-profile-v1.0.pdf>

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#### Related work:

This specification is related to:

- *Key Management Interoperability Protocol Profiles Version 1.0*. 01 October 2010. OASIS Standard. <http://docs.oasis-open.org/kmip/profiles/v1.0/os/kmip-profiles-1.0-os.html>.
- *Key Management Interoperability Protocol Specification Version 1.1*. 24 January 2013. OASIS Standard. <http://docs.oasis-open.org/kmip/spec/v1.1/os/kmip-spec-v1.1-os.html>.
- *Key Management Interoperability Protocol Specification Version 1.2*. Latest version. <http://docs.oasis-open.org/kmip/spec/v1.2/kmip-spec-v1.2.html>.

#### Abstract:

Describes a profile for Tape Libraries as KMIP clients interacting with KMIP servers.

#### Status:

This document was last revised or approved by the OASIS Key Management Interoperability Protocol (KMIP) TC on the above date. The level of approval is also listed above. Check the "Latest version" location noted above for possible later revisions of this document.

Technical Committee members should send comments on this specification to the Technical Committee's email list. Others should send comments to the Technical Committee by using the

“Send A Comment” button on the Technical Committee’s web page at <http://www.oasis-open.org/committees/kmip/>.

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**Citation format:**

When referencing this specification the following citation format should be used:

**[kmip-tape-lib-v1.0]**

*KMIP Tape Library Profile Version 1.0*. 31 October 2013. OASIS Committee Specification Draft 01. <http://docs.oasis-open.org/kmip/kmip-tape-lib-profile/v1.0/csd01/kmip-tape-lib-profile-v1.0-csd01.html>.

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# Table of Contents

1	Introduction.....	5
1.1	Terminology.....	5
1.2	Normative References.....	5
1.3	Non-Normative References.....	6
2	Tape Library Profile.....	7
2.1	Authentication Suite.....	7
2.2	Baseline Tape Library.....	7
2.3	Using Application Specific Information for Key Identifiers.....	8
2.4	Using Alternative Name for tape media barcode.....	10
3	Tape Library Profile Test Cases.....	11
3.1	Mandatory Test Cases.....	11
3.1.1	TL-M-1-10 - Configuration.....	11
3.1.2	TL-M-2-10 - Write with new (created) key.....	12
3.1.3	TL-M-3-10 - Read an encrypted tape.....	14
3.1.4	TL-M-1-11 - Configuration.....	23
3.1.5	TL-M-2-11 - Write with new (created) key.....	24
3.1.6	TL-M-3-11 - Read an encrypted tape.....	26
3.1.7	TL-M-1-12 - Configuration.....	35
3.1.8	TL-M-2-12 - Write with new (created) key.....	36
3.1.9	TL-M-3-12 - Read an encrypted tape.....	38
4	Conformance.....	48
4.1	Conformance Statement.....	48
4.2	Permitted Test Case Variations.....	48
4.2.1	Variable Items.....	48
4.2.2	Variable behavior.....	49
Appendix A.	Acknowledgments.....	51
Appendix B.	KMIP Specification Cross Reference.....	54
Appendix C.	Revision History.....	59

# 1 Introduction

For normative definition of the elements of KMIP see the [KMIP Specification](#) [KMIP-SPEC] and the [KMIP Profiles](#) [KMIP-PROF].

Illustrative guidance for the implementation of KMIP clients and servers is provided in the [KMIP Usage Guide](#) [KMIP-UG].

This profile defines the necessary KMIP functionality that a Tape Library operating as a KMIP client SHALL use and a KMIP server conforming to this profile SHALL support in order to interoperate in conformance with this profile.

## 1.1 Terminology

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 [RFC2119].

Key Associated Data (KAD)	Part of the tape format. May be segmented into authenticated and unauthenticated fields. KAD usage is detailed in the SCSI SSC-3 standard from the T10 organization available as ANSI INCITS 335-2000.
Hexadecimal Numeric Characters	Case-sensitive, printable, single byte ASCII characters representing the numbers 0 through 9 and uppercase alpha A through F. (US-ASCII characters 30h-39h and 41h-46h). Each byte (single 8-bit numeric value) is represented as two hexadecimal numeric characters with the high-nibble represented by the first (left-most) hexadecimal numeric character and the low-nibble represented by the second (right-most) hexadecimal numeric character.
N(a)	The maximum number of bytes in the tape authenticated KAD field. For LTO4, N(a) is 12 bytes. For LTO5, N(a) is 60 bytes. For LTO6, N(a) is 60 bytes.
N(u)	The maximum number of bytes in the tape unauthenticated KAD field. For LTO4, N(u) is 32 bytes. For LTO5, N(u) is 32 bytes. For LTO6, N(u) is 32 bytes.
N(k)	The maximum number of bytes in the tape format KAD fields – i.e. N(a) + N(u). For LTO4, N(k) is 44 bytes. For LTO5, N(k) is 92 bytes. For LTO6, N(k) is 92 bytes.

## 1.2 Normative References

- [RFC2119] Bradner, S., “Key words for use in RFCs to Indicate Requirement Levels”, BCP 14, RFC 2119, March 1997. <http://www.ietf.org/rfc/rfc2119.txt>.

- 18 **[RFC2246]** T. Dierks and C. Allen, *The TLS Protocol, Version 1.0*, IETF RFC 2246, Jan  
 19 1999, <http://www.ietf.org/rfc/rfc2246.txt>
- 20 **[KMIP-SPEC]** One or more of [KMIP-SPEC-1\_0], [KMIP-SPEC-1\_1], [KMIP-SPEC-1\_2]  
 21 **[KMIP-SPEC-1\_0]** Key Management Interoperability Protocol Specification Version 1.0  
 22 <http://docs.oasis-open.org/kmip/spec/v1.0/os/kmip-spec-1.0-os.doc>  
 23 OASIS Standard, October 2010.
- 24 **[KMIP-SPEC-1\_1]** *Key Management Interoperability Protocol Specification Version 1.1.*  
 25 <http://docs.oasis-open.org/kmip/spec/v1.1/os/kmip-spec-v1.1-os.doc>  
 26 OASIS Standard. 24 January 2013.
- 27 **[KMIP-SPEC-1\_2]** *Key Management Interoperability Protocol Specification Version 1.2.*  
 28 **URL**  
 29 Candidate OASIS Standard 01. **DD MMM YYYY.**
- 30 **[KMIP-PROF]** One or more of [KMIP-PROF-1\_0], [KMIP-PROF-1\_1], [KMIP-PROF-1\_2]  
 31 **[KMIP-PROF-1\_0]** *Key Management Interoperability Protocol Usage Guide Version 1.0.*  
 32 <http://docs.oasis-open.org/kmip/profiles/v1.0/os/kmip-profiles-1.0-os.doc>  
 33 OASIS Standard. 1 October 2010.
- 34 **[KMIP-PROF-1\_1]** *Key Management Interoperability Protocol Usage Guide Version 1.1.*  
 35 <http://docs.oasis-open.org/kmip/profiles/v1.1/os/kmip-profiles-v1.1-os.doc>  
 36 OASIS Standard 01. 24 January 2013.
- 37 **[KMIP-PROF-1\_2]** *Key Management Interoperability Protocol Usage Guide Version 1.2.*  
 38 **URL**  
 39 Candidate OASIS Standard 01. **DD MMM YYYY.**

### 40 1.3 Non-Normative References

- 41 **[KMIP-UG]** One or more of [KMIP-UG-1\_0], [KMIP-UG-1\_1], [KMIP-UG-1\_2]  
 42 **[KMIP-UG-1\_0]** *Key Management Interoperability Protocol Usage Guide Version 1.0.*  
 43 <http://docs.oasis-open.org/kmip/ug/v1.1/kmip-ug-v1.1-cnd01.doc>  
 44 Committee Note Draft, 1 December 2011
- 45 **[KMIP-UG-1\_1]** *Key Management Interoperability Protocol Usage Guide Version 1.1.*  
 46 <http://docs.oasis-open.org/kmip/ug/v1.1/cn01/kmip-ug-v1.1-cn01.doc>  
 47 Committee Note 01, 27 July 2012
- 48 **[KMIP-UG-1\_2]** *Key Management Interoperability Protocol Usage Guide Version 1.2.*  
 49 **URL**  
 50 Committee Note Draft, **DD MMM YYYY**
- 51 **[KMIP-TC-1\_1]** *Key Management Interoperability Protocol Test Cases Version 1.1.*  
 52 [http://docs.oasis-open.org/kmip/testcases/v1.1/cn01/kmip-testcases-v1.1-](http://docs.oasis-open.org/kmip/testcases/v1.1/cn01/kmip-testcases-v1.1-cn01.doc)  
 53 [cn01.doc](http://docs.oasis-open.org/kmip/testcases/v1.1/cn01/kmip-testcases-v1.1-cn01.doc), Committee Note 01, 27 July 2012.
- 54 **[KMIP-TC-1\_2]** *Key Management Interoperability Protocol Test Cases Version 1.2.*  
 55 **URL**, Committee Note Draft, **DD MMM YYYY.**
- 56 **[KMIP-UC]** *Key Management Interoperability Protocol Use Cases Version 1.0.*  
 57 [http://docs.oasis-open.org/kmip/usecases/v1.0/cs01/kmip-usecases-1.0-cs-](http://docs.oasis-open.org/kmip/usecases/v1.0/cs01/kmip-usecases-1.0-cs-01.doc)  
 58 [01.doc](http://docs.oasis-open.org/kmip/usecases/v1.0/cs01/kmip-usecases-1.0-cs-01.doc), Committee Specification, 15 June 2010.

---

## 2 Tape Library Profile

59

60 The Tape Library Profile specifies the behavior of a tape library operating as a KMIP client interacting with  
61 a KMIP server.

### 2.1 Authentication Suite

62

63 Implementations conformant to this profile SHALL support at least one of the Authentication Suites  
64 defined within [KMIP-PROF]. The establishment of the trust relationship between the KMIP client and the  
65 KMIP server is the same as the defined base profiles for the version of the profile supported.

### 2.2 Baseline Tape Library

66

67 KMIP clients conformant to this profile under [KMIP-SPEC]:

- 68 1. SHALL conform to the KMIP Baseline Client profile in [KMIP-PROF] and [KMIP-SPEC]
- 69 2. SHOULD support *Application Specific Information* [KMIP-SPEC] with Application Data provided  
70 by the client in accordance with section 2.3
- 71 3. SHOULD NOT use a *Custom Attribute* [KMIP-SPEC] that duplicates information that is already in  
72 standard *Attributes* [KMIP-SPEC]
- 73 4. MAY use x-Barcode as a *Custom Attribute* [KMIP-SPEC] of type Text String to store the barcode
- 74 5. MAY support any clause within [KMIP-SPEC] provided it does not conflict with any other clause  
75 within this section 2.2
- 76 6. MAY support extensions outside the scope of this standard (e.g., vendor extensions,  
77 conformance clauses) that do not conflict with any KMIP requirements

78

79 KMIP clients conformant to this profile under [KMIP-SPEC-1\_2]:

- 80 1. SHALL support the following *Attributes* [KMIP-SPEC]  
81 a. *Alternative Name* [KMIP-SPEC-1\_2]
- 82 2. SHALL support the following *Message Encoding* [KMIP-SPEC-1\_2]:  
83 a. *Alternative Name Type Enumeration* [KMIP-SPEC-1\_2] value:  
84 i. Uninterpreted Text String
- 85 3. SHALL store the media barcode information in an *Alternative Name* [KMIP-SPEC-1\_2] *Attribute*  
86 [KMIP-SPEC-1\_2] in accordance with section 2.4

87

88 KMIP servers conformant to this profile under [KMIP-SPEC]:

- 89 1. SHALL conform to the KMIP Baseline Server profile in [KMIP-PROF] and [KMIP-SPEC]
- 90 2. SHALL support the following *Objects* [KMIP-SPEC]  
91 a. *Symmetric Key* [KMIP-SPEC]
- 92 3. SHALL support the following *Attributes* [KMIP-SPEC]  
93 a. *Name* [KMIP-SPEC]  
94 b. *Cryptographic Algorithm* [KMIP-SPEC]  
95 c. *Custom Attribute* [KMIP SPEC]  
96 d. *Application Specific Information* [KMIP SPEC]
- 97 4. SHALL support the following *Client-to-Server Operations* [KMIP-SPEC]:  
98 a. *Create* [KMIP-SPEC]

- 99 5. SHALL support the following *Message Contents* [KMIP-SPEC]:  
100 a. *Batch Order Option* [KMIP-SPEC] value:  
101 i. True  
102 b. *Batch Count* [KMIP-SPEC] value:  
103 i. 1 to 32  
104 6. SHALL support the following *Message Encoding* [KMIP-SPEC]:  
105 a. *Cryptographic Algorithm Enumeration* [KMIP-SPEC] value:  
106 i. AES  
107 b. *Object Type Enumeration* [KMIP-SPEC] value:  
108 i. Symmetric Key  
109 c. *Key Format Type Enumeration* [KMIP-SPEC] value:  
110 i. Raw  
111 d. *Cryptographic Length* [KMIP-SPEC] value :  
112 i. 256-bit  
113 e. *Name Type Enumeration* [KMIP-SPEC] value:  
114 i. Uninterpreted Text String  
115 7. SHALL support *Custom Attribute* [KMIP-SPEC] with the following data types and properties:  
116 a. Text String  
117 b. Integer  
118 c. Date Time  
119 8. SHALL support a minimum length of 256 characters for *Custom Attribute* [KMIP-SPEC] and  
120 *Name* [KMIP-SPEC] values where the attribute type is of variable length  
121 9. SHALL support a minimum of 30 *Custom Attribute* [KMIP-SPEC] per managed object  
122 10. SHALL support a minimum of 64 characters in *Custom Attribute* [KMIP-SPEC] names  
123 11. SHALL support the Tape Library Profile Test Cases, returning results in accordance with the test  
124 cases  
125 12. MAY support any clause within [KMIP-SPEC] provided it does not conflict with any other clause  
126 within this section 2.2  
127 13. MAY support extensions outside the scope of this standard (e.g., vendor extensions,  
128 conformance clauses) that do not conflict with any KMIP requirements  
129

130 KMIP servers conformant to this profile under [KMIP-SPEC-1\_2]:

- 131 1. SHALL support the following *Attributes* [KMIP-SPEC]  
132 a. *Alternative Name* [KMIP-SPEC-1\_2]  
133 2. SHALL support the following *Message Encoding* [KMIP-SPEC-1\_2]:  
134 a. *Alternative Name Type Enumeration* [KMIP-SPEC-1\_2] value:  
135 i. Uninterpreted Text String

## 136 2.3 Using Application Specific Information for Key Identifiers

137 This information applies to Tape Libraries that use the *Application Specific Information* [KMIP-SPEC]  
138 attribute to store key identifiers. KMIP clients are NOT required to use *Application Specific Information*  
139 [KMIP-SPEC] however KMIP servers are required to support KMIP clients that use *Application Specific*  
140 *Information* [KMIP-SPEC] and KMIP clients that do not use *Application Specific Information* [KMIP-  
141 SPEC].



142 The *Application Specific Information* [KMIP-SPEC] MAY be used to store data that is specific to the  
143 application (Tape Library) using the object.

144 The following Application Namespaces SHOULD be used in the Application Namespace field of the  
145 *Application Specific Information* [KMIP-SPEC]:

- 146 • LIBRARY-LTO, LIBRARY-LTO4, LIBRARY-LTO5, and LIBRARY-LTO6

147 For backwards compatibility with deployed Tape Library implementations, servers MAY support  
148 VENDOR-LIBRARY-LTO as an Application Namespace, where VENDOR is an ASCII string that SHALL  
149 NOT be further interpreted and SHALL be handled by the server as if the Application Namespace was set  
150 to LIBRARY-LTO.

151 *Application Specific Information* [KMIP-SPEC] supports key identifiers being created either on the server  
152 or on the client (Tape Library), but not both. This profile specifies key identifiers created by the client.

153 The *Application Specific Information* [KMIP-SPEC] method of key identification relies on the ability to  
154 uniquely identify a key based only on its Application Data (preferably), or (alternatively) on some  
155 combination of Application Data and *Custom Attributes* [KMIP-SPEC], which the key creator guarantees  
156 to be unique within the Application Namespace.

157 Key identifiers stored in the KMIP server's *Application Specific Information* [KMIP-SPEC] are in ASCII  
158 format. Key identifiers stored in the KMIP client's tape format KAD fields are numeric format. The  
159 specific algorithm for converting between text and numeric formats is specified below.

160 All information contained in the tape format's KAD fields is converted to an ASCII string consisting of  
161 hexadecimal numeric character pairs as follows:

- 162 1. The unauthenticated KAD is converted to text;
- 163 2. The authenticated KAD is converted to text and;
- 164 3. The converted authenticated KAD text is concatenated to the end of the converted  
165 unauthenticated KAD text.

166 If the implementation uses client-created key identifiers, then the client generates a new identifier in  
167 ASCII format that SHALL be unique within the chosen namespace. The source material for generating the  
168 string is dependent on client policy. The numeric representation of this identifier SHALL be no larger than  
169 the N(k) bytes of the KAD for the tape media being used.

170 For KMIP clients and servers conforming to this profile, *Application Specific Information* [KMIP-SPEC]  
171 SHALL be created by the Tape Library KMIP client based on the tape format's KAD fields as follows:

- 172 1. Define an empty output buffer sufficient to contain a string with a maximum length of  $2*N(k)$   
173 bytes.
- 174 2. Copy the tape format's unauthenticated KAD (if present) to the output buffer, converting each  
175 byte value to exactly two Hexadecimal Numeric Characters. The first byte (i.e., byte 0) of the  
176 output buffer is the first byte of unauthenticated KAD.
- 177 3. Concatenate the tape format's authenticated KAD to the output buffer, converting each byte value  
178 to exactly two Hexadecimal Numeric Characters.

179

180 Note: the contents of the unauthenticated KAD and authenticated KAD fields may be less than the  
181 maximum permitted lengths; the implementation provides the correct length values to use in the algorithm  
182 rather than using fixed maximum length fields.

183 If *Application Specific Information* [KMIP-SPEC] is supported, then it SHALL be used by the client for  
184 locating the object for the purpose of encrypting and decrypting data on tape. The *Application Specific*  
185 *Information* [KMIP-SPEC] value SHALL solely be used for this purpose.

186

187 Refer to [KMIP-UG] for further non-normative details of conversion to and from KAD values.

## 188 **2.4 Using Alternative Name for tape media barcode**

189 The Tape Library client SHALL assign a text (i.e., human-readable) representation of the media barcode  
190 to the *Alternative Name* [KMIP-SPEC-1\_2] of the object. This SHALL occur on first use of the object for  
191 encryption, which normally is when the library requests the server to create the object.

192  
193 The relationship between key identifiers in *Application Specific Information* [KMIP-SPEC] and *Alternative*  
194 *Name* [KMIP-SPEC-1\_2] is as follows:

- 195 a) The values for both are provided by the client
- 196 b) The identifier in *Alternative Name* [KMIP-SPEC-1\_2] (i.e., the barcode) SHALL be used by the  
197 server administrator for finding keys associated with specific tape media (e.g., a server  
198 administrator may want to find the key(s) associated with a missing tape cartridge, where the  
199 barcode of that tape cartridge is known).
- 200 c) The *Alternative Name* [KMIP-SPEC-1\_2] SHALL NOT be used by a client for locating the object  
201 to encrypt or decrypt data, since the value (barcode) is NOT required to be unique and therefore  
202 does not ensure retrieval of the correct key.

203 Refer to [KMIP-UG-1\_2] for further non-normative details of *Alternative Name* [KMIP-SPEC-1\_2] usage.

## 204 3 Tape Library Profile Test Cases

205 This section documents the test cases that a client or server conformant to the Tape Library Profile  
206 SHALL support.

207 Note: the values for the returned items and the *Custom Attributes* are illustrative. Actual values from a  
208 real client system will vary. These test cases demonstrate usage of all of the mandatory types that are  
209 required to be supported in a server implementation.

### 210 3.1 Mandatory Test Cases

211 This section documents the test cases that a client or server conformant to the Tape Library Profile  
212 SHALL support for each version of the KMIP protocol (major and minor).

#### 213 3.1.1 TL-M-1-10 - Configuration

214 Determine server configuration details including operations supported (only the mandatory operations are  
215 listed in the response example), objects supported (only the mandatory objects types are listed in the  
216 response example), optional server information, and optional list of application name spaces.

```
0001 # TIME 0
0002 <RequestMessage>
0003   <RequestHeader>
0004     <ProtocolVersion>
0005       <ProtocolVersionMajor type="Integer" value="1"/>
0006       <ProtocolVersionMinor type="Integer" value="0"/>
0007     </ProtocolVersion>
0008     <BatchCount type="Integer" value="1"/>
0009   </RequestHeader>
0010   <BatchItem>
0011     <Operation type="Enumeration" value="Query"/>
0012     <UniqueBatchItemID type="ByteString" value="01"/>
0013     <RequestPayload>
0014       <QueryFunction type="Enumeration" value="QueryOperations"/>
0015       <QueryFunction type="Enumeration" value="QueryObjects"/>
0016       <QueryFunction type="Enumeration"
0017       value="QueryServerInformation"/>
0018       <QueryFunction type="Enumeration"
0019       value="QueryApplicationNamespaces"/>
0020     </RequestPayload>
0021   </BatchItem>
0022 </RequestMessage>
0023 <ResponseMessage>
0024   <ResponseHeader>
0025     <ProtocolVersion>
0026       <ProtocolVersionMajor type="Integer" value="1"/>
0027       <ProtocolVersionMinor type="Integer" value="0"/>
0028     </ProtocolVersion>
0029     <TimeStamp type="DateTime" value="2012-10-05T21:35:17+00:00"/>
0030     <BatchCount type="Integer" value="1"/>
0031   </ResponseHeader>
0032   <BatchItem>
0033     <Operation type="Enumeration" value="Query"/>
0034     <UniqueBatchItemID type="ByteString" value="01"/>
0035     <ResultStatus type="Enumeration" value="Success"/>
0036   </BatchItem>
0037 </ResponseMessage>
```

```

0034     <Operation type="Enumeration" value="Query"/>
0035     <Operation type="Enumeration" value="Locate"/>
0036     <Operation type="Enumeration" value="Destroy"/>
0037     <Operation type="Enumeration" value="Get"/>
0038     <Operation type="Enumeration" value="Create"/>
0039     <Operation type="Enumeration" value="Register"/>
0040     <Operation type="Enumeration" value="GetAttributes"/>
0041     <Operation type="Enumeration" value="GetAttributeList"/>
0042     <Operation type="Enumeration" value="AddAttribute"/>
0043     <Operation type="Enumeration" value="ModifyAttribute"/>
0044     <Operation type="Enumeration" value="DeleteAttribute"/>
0045     <Operation type="Enumeration" value="Activate"/>
0046     <Operation type="Enumeration" value="Revoke"/>
0047     <Operation type="Enumeration" value="Check"/>
0048     <ObjectType type="Enumeration" value="SymmetricKey"/>
0049     <ObjectType type="Enumeration" value="Template"/>
0050     <VendorIdentification type="TextString" value="server-
vendor.com"/>
0051     <ServerInformation>
0052     </ServerInformation>
0053     </ResponsePayload>
0054     </BatchItem>
0055 </ResponseMessage>

```

217

### 218 3.1.2 TL-M-2-10 - Write with new (created) key

219 This case may occur when the Write operation starts with the first block on a tape. The implementation  
220 may choose which Write operations qualify for creation of a new key. Regardless of the initiating  
221 circumstances, the Tape Library requests the server to create a new AES-256 symmetric key with  
222 appropriate identifying information which is unique within the Application Namespace.

223 Additional custom attributes MAY be specified in order to:

- 224 - ensure uniqueness of the key identifier when later Locating the key via ASI
- 225 - provide human-readable information (such as the tape Barcode value)
- 226 - provide information to support client-specific purposes

```

# TIME 0
0001 <RequestMessage>
0002   <RequestHeader>
0003     <ProtocolVersion>
0004       <ProtocolVersionMajor type="Integer" value="1"/>
0005       <ProtocolVersionMinor type="Integer" value="0"/>
0006     </ProtocolVersion>
0007     <BatchOrderOption type="Boolean" value="true"/>
0008     <BatchCount type="Integer" value="2"/>
0009   </RequestHeader>
0010   <BatchItem>
0011     <Operation type="Enumeration" value="Create"/>
0012     <UniqueBatchItemID type="ByteString" value="01"/>
0013   <RequestPayload>
0014     <ObjectType type="Enumeration" value="SymmetricKey"/>
0015     <TemplateAttribute>
0016       <Attribute>
0017         <AttributeName type="TextString" value="x-ID"/>
0018         <AttributeValue type="TextString" value="TL-M-2-10"/>
0019       </Attribute>
0020     </Attribute>

```

```

0021         <AttributeName type="TextString" value="Name"/>
0022         <AttributeValue>
0023         <NameValue type="TextString"
value="AAAAAA1A1AA12345678901234567"/>
0024         <NameType type="Enumeration"
value="UninterpretedTextString"/>
0025         </AttributeValue>
0026     </Attribute>
0027 <Attribute>
0028     <AttributeName type="TextString" value="Cryptographic
Algorithm"/>
0029     <AttributeValue type="Enumeration" value="AES"/>
0030 </Attribute>
0031 <Attribute>
0032     <AttributeName type="TextString" value="Cryptographic
Length"/>
0033     <AttributeValue type="Integer" value="256"/>
0034 </Attribute>
0035 <Attribute>
0036     <AttributeName type="TextString" value="Cryptographic
Usage Mask"/>
0037     <AttributeValue type="Integer" value="Decrypt Encrypt"/>
0038 </Attribute>
0039 <Attribute>
0040     <AttributeName type="TextString" value="Application
Specific Information"/>
0041     <AttributeValue>
0042     <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0043     <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
000"/>
0044     </AttributeValue>
0045 </Attribute>
0046 <Attribute>
0047     <AttributeName type="TextString" value="x-Barcode"/>
0048     <AttributeValue type="TextString" value="XXA012A1"/>
0049 </Attribute>
0050 <Attribute>
0051     <AttributeName type="TextString" value="x-
VendorAttribute1"/>
0052     <AttributeValue type="TextString" value="XXA012A1"/>
0053 </Attribute>
0054 <Attribute>
0055     <AttributeName type="TextString" value="x-
VendorAttribute2"/>
0056     <AttributeValue type="Integer" value="0"/>
0057 </Attribute>
0058 <Attribute>
0059     <AttributeName type="TextString" value="x-
VendorAttribute3"/>
0060     <AttributeValue type="DateTime" value="2012-10-
05T22:08:19+00:00"/>
0061 </Attribute>
0062 </TemplateAttribute>
0063 </RequestPayload>
0064 </BatchItem>
0065 <BatchItem>

```



233 unique within the Application Namespace. An implementation may also use custom attributes for vendor-  
 234 unique purposes, or to improve usability.

235 The test case destroys the key created in the previous test case to clean up after the test. Tape Library  
 236 implementations MAY not perform this step.

237

```

0001 # TIME 0
0002 <RequestMessage>
0003   <RequestHeader>
0004     <ProtocolVersion>
0005       <ProtocolVersionMajor type="Integer" value="1"/>
0006       <ProtocolVersionMinor type="Integer" value="0"/>
0007     </ProtocolVersion>
0008     <BatchOrderOption type="Boolean" value="true"/>
0009     <BatchCount type="Integer" value="2"/>
0010   </RequestHeader>
0011   <BatchItem>
0012     <Operation type="Enumeration" value="Locate"/>
0013     <UniqueBatchItemID type="ByteString" value="01"/>
0014     <RequestPayload>
0015       <Attribute>
0016         <AttributeName type="TextString" value="Object Type"/>
0017         <AttributeValue type="Enumeration" value="SymmetricKey"/>
0018       </Attribute>
0019       <Attribute>
0020         <AttributeName type="TextString" value="Application Specific
0021 Information"/>
0022         <AttributeValue>
0023           <ApplicationNamespace type="TextString" value="LIBRARY-
0024 LTO"/>
0025           <ApplicationData type="TextString"
0026 value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
0027 000"/>
0028         </AttributeValue>
0029       </Attribute>
0030     </RequestPayload>
0031   </BatchItem>
0032   <BatchItem>
0033     <Operation type="Enumeration" value="Get"/>
0034     <UniqueBatchItemID type="ByteString" value="02"/>
0035     <RequestPayload>
0036     </RequestPayload>
0037   </BatchItem>
0038 </RequestMessage>
0039 <ResponseMessage>
0040   <ResponseHeader>
0041     <ProtocolVersion>
0042       <ProtocolVersionMajor type="Integer" value="1"/>
0043       <ProtocolVersionMinor type="Integer" value="0"/>
0044     </ProtocolVersion>
0045     <TimeStamp type="DateTime" value="2012-10-05T22:00:32+00:00"/>
0046     <BatchCount type="Integer" value="2"/>
0047   </ResponseHeader>
0048   <BatchItem>
0049     <Operation type="Enumeration" value="Locate"/>
0050     <UniqueBatchItemID type="ByteString" value="01"/>
0051     <ResultStatus type="Enumeration" value="Success"/>
0052   </BatchItem>
0053 </ResponsePayload>
  
```





0097	<BatchItem>
0098	<Operation type="Enumeration" value="GetAttributeList"/>
0099	<UniqueBatchItemID type="ByteString" value="02"/>
0100	<RequestPayload>
0101	</RequestPayload>
0102	</BatchItem>
0103	</RequestMessage>
0104	<ResponseMessage>
0105	<ResponseHeader>
0106	<ProtocolVersion>
0107	<ProtocolVersionMajor type="Integer" value="1"/>
0108	<ProtocolVersionMinor type="Integer" value="0"/>
0109	</ProtocolVersion>
0110	<TimeStamp type="DateTime" value="2012-10-05T22:00:33+00:00"/>
0111	<BatchCount type="Integer" value="2"/>
0112	</ResponseHeader>
0113	<BatchItem>
0114	<Operation type="Enumeration" value="Locate"/>
0115	<UniqueBatchItemID type="ByteString" value="01"/>
0116	<ResultStatus type="Enumeration" value="Success"/>
0117	<ResponsePayload>
0118	<UniqueIdentifier type="TextString" value="\$UNIQUE_IDENTIFIER_0"/>
0119	</ResponsePayload>
0120	</BatchItem>
0121	<BatchItem>
0122	<Operation type="Enumeration" value="GetAttributeList"/>
0123	<UniqueBatchItemID type="ByteString" value="02"/>
0124	<ResultStatus type="Enumeration" value="Success"/>
0125	<ResponsePayload>
0126	<UniqueIdentifier type="TextString" value="\$UNIQUE_IDENTIFIER_0"/>
0127	<AttributeName type="TextString" value="x-ID"/>
0128	<AttributeName type="TextString" value="x-Barcode"/>
0129	<AttributeName type="TextString" value="x-VendorAttribute1"/>
0130	<AttributeName type="TextString" value="x-VendorAttribute2"/>
0131	<AttributeName type="TextString" value="x-VendorAttribute3"/>
0132	<AttributeName type="TextString" value="Unique Identifier"/>
0133	<AttributeName type="TextString" value="Object Type"/>
0134	<AttributeName type="TextString" value="Cryptographic Algorithm"/>
0135	<AttributeName type="TextString" value="Cryptographic Length"/>
0136	<AttributeName type="TextString" value="Application Specific Information"/>
0137	<AttributeName type="TextString" value="Cryptographic Usage Mask"/>
0138	<AttributeName type="TextString" value="Digest"/>
0139	<AttributeName type="TextString" value="Initial Date"/>
0140	<AttributeName type="TextString" value="Last Change Date"/>
0141	<AttributeName type="TextString" value="Lease Time"/>
0142	<AttributeName type="TextString" value="Name"/>
0143	<AttributeName type="TextString" value="State"/>
0144	</ResponsePayload>
0145	</BatchItem>
0146	</ResponseMessage>
0147	# TIME 2 <RequestMessage>

```

0148 <RequestHeader>
0149   <ProtocolVersion>
0150     <ProtocolVersionMajor type="Integer" value="1"/>
0151     <ProtocolVersionMinor type="Integer" value="0"/>
0152   </ProtocolVersion>
0153   <BatchOrderOption type="Boolean" value="true"/>
0154   <BatchCount type="Integer" value="2"/>
0155 </RequestHeader>
0156 <BatchItem>
0157   <Operation type="Enumeration" value="Locate"/>
0158   <UniqueBatchItemID type="ByteString" value="01"/>
0159   <RequestPayload>
0160     <Attribute>
0161       <AttributeName type="TextString" value="Object Type"/>
0162       <AttributeValue type="Enumeration" value="SymmetricKey"/>
0163     </Attribute>
0164     <Attribute>
0165       <AttributeName type="TextString" value="Application Specific
0166 Information"/>
0167       <AttributeValue>
0168         <ApplicationNamespace type="TextString" value="LIBRARY-
0169 LTO"/>
0170         <ApplicationData type="TextString"
0171 value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
0172 000"/>
0173       </AttributeValue>
0174     </Attribute>
0175   </RequestPayload>
0176 </BatchItem>
0177 <BatchItem>
0178   <Operation type="Enumeration" value="GetAttributes"/>
0179   <UniqueBatchItemID type="ByteString" value="02"/>
0180   <RequestPayload>
0181     </RequestPayload>
0182 </BatchItem>
0183 </RequestMessage>
0184 <ResponseMessage>
0185   <ResponseHeader>
0186     <ProtocolVersion>
0187       <ProtocolVersionMajor type="Integer" value="1"/>
0188       <ProtocolVersionMinor type="Integer" value="0"/>
0189     </ProtocolVersion>
0190     <TimeStamp type="DateTime" value="2012-10-05T22:00:32+00:00"/>
0191     <BatchCount type="Integer" value="2"/>
0192   </ResponseHeader>
0193   <BatchItem>
0194     <Operation type="Enumeration" value="Locate"/>
0195     <UniqueBatchItemID type="ByteString" value="01"/>
0196     <ResultStatus type="Enumeration" value="Success"/>
0197     <ResponsePayload>
0198       <UniqueIdentifier type="TextString"
0199 value="$UNIQUE_IDENTIFIER_0"/>
0200     </ResponsePayload>
0201   </BatchItem>
0202   <BatchItem>
0203     <Operation type="Enumeration" value="GetAttributes"/>
0204     <UniqueBatchItemID type="ByteString" value="02"/>
0205     <ResultStatus type="Enumeration" value="Success"/>

```

```

0201     <ResponsePayload>
0202     <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0203     <Attribute>
0204         <AttributeName type="TextString" value="x-ID"/>
0205         <AttributeValue type="TextString" value="TL-M-2-10"/>
0206     </Attribute>
0207     <Attribute>
0208         <AttributeName type="TextString" value="x-Barcode"/>
0209         <AttributeValue type="TextString" value="XXA012A1"/>
0210     </Attribute>
0211     <Attribute>
0212         <AttributeName type="TextString" value="x-
VendorAttribute1"/>
0213         <AttributeValue type="TextString" value="XXA012A1"/>
0214     </Attribute>
0215     <Attribute>
0216         <AttributeName type="TextString" value="x-
VendorAttribute2"/>
0217         <AttributeValue type="Integer" value="0"/>
0218     </Attribute>
0219     <Attribute>
0220         <AttributeName type="TextString" value="x-
VendorAttribute3"/>
0221         <AttributeValue type="DateTime" value="2012-10-
05T22:08:19+00:00"/>
0222     </Attribute>
0223     <Attribute>
0224         <AttributeName type="TextString" value="Unique Identifier"/>
0225         <AttributeValue type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0226     </Attribute>
0227     <Attribute>
0228         <AttributeName type="TextString" value="Object Type"/>
0229         <AttributeValue type="Enumeration" value="SymmetricKey"/>
0230     </Attribute>
0231     <Attribute>
0232         <AttributeName type="TextString" value="Cryptographic
Algorithm"/>
0233         <AttributeValue type="Enumeration" value="AES"/>
0234     </Attribute>
0235     <Attribute>
0236         <AttributeName type="TextString" value="Cryptographic
Length"/>
0237         <AttributeValue type="Integer" value="256"/>
0238     </Attribute>
0239     <Attribute>
0240         <AttributeName type="TextString" value="Application Specific
Information"/>
0241         <AttributeValue>
0242             <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0243             <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
000"/>
0244         </AttributeValue>
0245     </Attribute>
0246     </Attribute>

```

0247	<AttributeName type="TextString" value="Cryptographic Usage Mask"/>
0248	<AttributeValue type="Integer" value="Decrypt Encrypt"/>
0249	</Attribute>
0250	<Attribute>
0251	<AttributeName type="TextString" value="Digest"/>
0252	<AttributeValue>
0253	<HashingAlgorithm type="Enumeration" value="SHA_256"/>
0254	<DigestValue type="ByteString" value="0bd3d7ada745e4eb34cc9d26cc84d4852a15906b2f77f80d01fc31c28108c49b"/>
0255	</AttributeValue>
0256	</Attribute>
0257	<Attribute>
0258	<AttributeName type="TextString" value="Initial Date"/>
0259	<AttributeValue type="DateTime" value="2012-10-05T21:41:46+00:00"/>
0260	</Attribute>
0261	<Attribute>
0262	<AttributeName type="TextString" value="Last Change Date"/>
0263	<AttributeValue type="DateTime" value="2012-10-05T21:41:46+00:00"/>
0264	</Attribute>
0265	<Attribute>
0266	<AttributeName type="TextString" value="Lease Time"/>
0267	<AttributeValue type="Interval" value="3600"/>
0268	</Attribute>
0269	<Attribute>
0270	<AttributeName type="TextString" value="Name"/>
0271	<AttributeValue>
0272	<NameValue type="TextString" value="AAAAAAA1A1AA12345678901234567"/>
0273	<NameType type="Enumeration" value="UninterpretedTextString"/>
0274	</AttributeValue>
0275	</Attribute>
0276	<Attribute>
0277	<AttributeName type="TextString" value="State"/>
0278	<AttributeValue type="Enumeration" value="PreActive"/>
0279	</Attribute>
0280	</ResponsePayload>
0281	</BatchItem>
0282	</ResponseMessage>
0283	# TIME 3 <RequestMessage>
0284	<RequestHeader>
0285	<ProtocolVersion>
0286	<ProtocolVersionMajor type="Integer" value="1"/>
0287	<ProtocolVersionMinor type="Integer" value="0"/>
0288	</ProtocolVersion>
0289	<BatchOrderOption type="Boolean" value="true"/>
0290	<BatchCount type="Integer" value="3"/>
0291	</RequestHeader>
0292	<BatchItem>
0293	<Operation type="Enumeration" value="Locate"/>
0294	<UniqueBatchItemID type="ByteString" value="01"/>
0295	<RequestPayload>
0296	<Attribute>

0297	<AttributeName type="TextString" value="Object Type"/>
0298	<AttributeValue type="Enumeration" value="SymmetricKey"/>
0299	</Attribute>
0300	<Attribute>
0301	<AttributeName type="TextString" value="Application Specific Information"/>
0302	<AttributeValue>
0303	<ApplicationNamespace type="TextString" value="LIBRARY-LTO"/>
0304	<ApplicationData type="TextString" value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000"/>
0305	</AttributeValue>
0306	</Attribute>
0307	</RequestPayload>
0308	</BatchItem>
0309	<BatchItem>
0310	<Operation type="Enumeration" value="ModifyAttribute"/>
0311	<UniqueBatchItemID type="ByteString" value="02"/>
0312	<RequestPayload>
0313	<Attribute>
0314	<AttributeName type="TextString" value="x-VendorAttribute2"/>
0315	<AttributeValue type="DateTime" value="2012-10-05T22:27:06+00:00"/>
0316	</Attribute>
0317	</RequestPayload>
0318	</BatchItem>
0319	<BatchItem>
0320	<Operation type="Enumeration" value="ModifyAttribute"/>
0321	<UniqueBatchItemID type="ByteString" value="03"/>
0322	<RequestPayload>
0323	<Attribute>
0324	<AttributeName type="TextString" value="x-VendorAttribute3"/>
0325	<AttributeValue type="Integer" value="1"/>
0326	</Attribute>
0327	</RequestPayload>
0328	</BatchItem>
0329	</RequestMessage>
0330	<ResponseMessage>
0331	<ResponseHeader>
0332	<ProtocolVersion>
0333	<ProtocolVersionMajor type="Integer" value="1"/>
0334	<ProtocolVersionMinor type="Integer" value="0"/>
0335	</ProtocolVersion>
0336	<TimeStamp type="DateTime" value="2012-10-05T22:00:33+00:00"/>
0337	<BatchCount type="Integer" value="3"/>
0338	</ResponseHeader>
0339	<BatchItem>
0340	<Operation type="Enumeration" value="Locate"/>
0341	<UniqueBatchItemID type="ByteString" value="01"/>
0342	<ResultStatus type="Enumeration" value="Success"/>
0343	<ResponsePayload>
0344	<UniqueIdentifier type="TextString" value="\$UNIQUE_IDENTIFIER_0"/>
0345	</ResponsePayload>
0346	</BatchItem>

0347	<BatchItem>
0348	<Operation type="Enumeration" value="ModifyAttribute"/>
0349	<UniqueBatchItemID type="ByteString" value="02"/>
0350	<ResultStatus type="Enumeration" value="Success"/>
0351	<ResponsePayload>
0352	<UniqueIdentifier type="TextString" value="\$UNIQUE_IDENTIFIER_0"/>
0353	<Attribute>
0354	<AttributeName type="TextString" value="x- VendorAttribute2"/>
0355	<AttributeValue type="DateTime" value="2012-10- 05T22:27:06+00:00"/>
0356	</Attribute>
0357	</ResponsePayload>
0358	</BatchItem>
0359	<BatchItem>
0360	<Operation type="Enumeration" value="ModifyAttribute"/>
0361	<UniqueBatchItemID type="ByteString" value="03"/>
0362	<ResultStatus type="Enumeration" value="Success"/>
0363	<ResponsePayload>
0364	<UniqueIdentifier type="TextString" value="\$UNIQUE_IDENTIFIER_0"/>
0365	<Attribute>
0366	<AttributeName type="TextString" value="x- VendorAttribute3"/>
0367	<AttributeValue type="Integer" value="1"/>
0368	</Attribute>
0369	</ResponsePayload>
0370	</BatchItem>
0371	</ResponseMessage>
	<i># TIME 4</i>
0372	<RequestMessage>
0373	<RequestHeader>
0374	<ProtocolVersion>
0375	<ProtocolVersionMajor type="Integer" value="1"/>
0376	<ProtocolVersionMinor type="Integer" value="0"/>
0377	</ProtocolVersion>
0378	<BatchCount type="Integer" value="1"/>
0379	</RequestHeader>
0380	<BatchItem>
0381	<Operation type="Enumeration" value="Destroy"/>
0382	<RequestPayload>
0383	<UniqueIdentifier type="TextString" value="\$UNIQUE_IDENTIFIER_0"/>
0384	</RequestPayload>
0385	</BatchItem>
0386	</RequestMessage>
0387	<ResponseMessage>
0388	<ResponseHeader>
0389	<ProtocolVersion>
0390	<ProtocolVersionMajor type="Integer" value="1"/>
0391	<ProtocolVersionMinor type="Integer" value="0"/>
0392	</ProtocolVersion>
0393	<TimeStamp type="DateTime" value="2012-10-05T22:00:33+00:00"/>
0394	<BatchCount type="Integer" value="1"/>
0395	</ResponseHeader>
0396	<BatchItem>
0397	<Operation type="Enumeration" value="Destroy"/>

0398	<ResultStatus type="Enumeration" value="Success"/>
0399	<ResponsePayload>
0400	<UniqueIdentifier type="TextString"
	value="\$UNIQUE_IDENTIFIER_0"/>
0401	</ResponsePayload>
0402	</BatchItem>
0403	</ResponseMessage>

238

### 239 3.1.4 TL-M-1-11 - Configuration

240 Determine server configuration details including operations supported (only the mandatory operations are  
 241 listed in the response example), objects supported (only the mandatory objects types are listed in the  
 242 response example), optional server information, and optional list of application name spaces.

	# TIME 0
0001	<RequestMessage>
0002	<RequestHeader>
0003	<ProtocolVersion>
0004	<ProtocolVersionMajor type="Integer" value="1"/>
0005	<ProtocolVersionMinor type="Integer" value="1"/>
0006	</ProtocolVersion>
0007	<BatchCount type="Integer" value="1"/>
0008	</RequestHeader>
0009	<BatchItem>
0010	<Operation type="Enumeration" value="Query"/>
0011	<UniqueBatchItemID type="ByteString" value="01"/>
0012	<RequestPayload>
0013	<QueryFunction type="Enumeration" value="QueryOperations"/>
0014	<QueryFunction type="Enumeration" value="QueryObjects"/>
0015	<QueryFunction type="Enumeration"
	value="QueryServerInformation"/>
0016	<QueryFunction type="Enumeration"
	value="QueryApplicationNamespaces"/>
0017	</RequestPayload>
0018	</BatchItem>
0019	</RequestMessage>
0020	<ResponseMessage>
0021	<ResponseHeader>
0022	<ProtocolVersion>
0023	<ProtocolVersionMajor type="Integer" value="1"/>
0024	<ProtocolVersionMinor type="Integer" value="1"/>
0025	</ProtocolVersion>
0026	<TimeStamp type="DateTime" value="2012-10-05T21:35:17+00:00"/>
0027	<BatchCount type="Integer" value="1"/>
0028	</ResponseHeader>
0029	<BatchItem>
0030	<Operation type="Enumeration" value="Query"/>
0031	<UniqueBatchItemID type="ByteString" value="01"/>
0032	<ResultStatus type="Enumeration" value="Success"/>
0033	<ResponsePayload>
0034	<Operation type="Enumeration" value="Query"/>
0035	<Operation type="Enumeration" value="Locate"/>
0036	<Operation type="Enumeration" value="Destroy"/>
0037	<Operation type="Enumeration" value="Get"/>
0038	<Operation type="Enumeration" value="Create"/>
0039	<Operation type="Enumeration" value="Register"/>
0040	<Operation type="Enumeration" value="GetAttributes"/>

```

0041     <Operation type="Enumeration" value="GetAttributeList"/>
0042     <Operation type="Enumeration" value="AddAttribute"/>
0043     <Operation type="Enumeration" value="ModifyAttribute"/>
0044     <Operation type="Enumeration" value="DeleteAttribute"/>
0045     <Operation type="Enumeration" value="Activate"/>
0046     <Operation type="Enumeration" value="Revoke"/>
0047     <Operation type="Enumeration" value="Check"/>
0048     <ObjectType type="Enumeration" value="SymmetricKey"/>
0049     <ObjectType type="Enumeration" value="Template"/>
0050     <VendorIdentification type="TextString" value="server-
vendor.com"/>
0051     <ServerInformation>
0052     </ServerInformation>
0053     </ResponsePayload>
0054     </BatchItem>
0055     </ResponseMessage>

```

243

### 244 3.1.5 TL-M-2-11 - Write with new (created) key

245 This case may occur when the Write operation starts with the first block on a tape. The implementation  
246 may choose which Write operations qualify for creation of a new key. Regardless of the initiating  
247 circumstances, the Tape Library requests the server to create a new AES-256 symmetric key with  
248 appropriate identifying information which is unique within the Application Namespace.

249 Additional custom attributes MAY be specified in order to:

- 250 - ensure uniqueness of the key identifier when later Locating the key via ASI
- 251 - provide human-readable information (such as the tape Barcode value)
- 252 - provide information to support client-specific purposes

```

# TIME 0
0001 <RequestMessage>
0002   <RequestHeader>
0003     <ProtocolVersion>
0004       <ProtocolVersionMajor type="Integer" value="1"/>
0005       <ProtocolVersionMinor type="Integer" value="1"/>
0006     </ProtocolVersion>
0007     <BatchOrderOption type="Boolean" value="true"/>
0008     <BatchCount type="Integer" value="2"/>
0009   </RequestHeader>
0010   <BatchItem>
0011     <Operation type="Enumeration" value="Create"/>
0012     <UniqueBatchItemID type="ByteString" value="01"/>
0013     <RequestPayload>
0014       <ObjectType type="Enumeration" value="SymmetricKey"/>
0015       <TemplateAttribute>
0016         <Attribute>
0017           <AttributeName type="TextString" value="x-ID"/>
0018           <AttributeValue type="TextString" value="TL-M-2-11"/>
0019         </Attribute>
0020         <Attribute>
0021           <AttributeName type="TextString" value="Name"/>
0022           <AttributeValue>
0023             <NameValue type="TextString"
value="AAAAAAAA1A1AA12345678901234567"/>
0024             <NameType type="Enumeration"
value="UninterpretedTextString"/>
0025           </AttributeValue>

```



```

0026         </Attribute>
0027         <Attribute>
0028             <AttributeName type="TextString" value="Cryptographic
Algorithm"/>
0029             <AttributeValue type="Enumeration" value="AES"/>
0030         </Attribute>
0031         <Attribute>
0032             <AttributeName type="TextString" value="Cryptographic
Length"/>
0033             <AttributeValue type="Integer" value="256"/>
0034         </Attribute>
0035         <Attribute>
0036             <AttributeName type="TextString" value="Cryptographic
Usage Mask"/>
0037             <AttributeValue type="Integer" value="Decrypt Encrypt"/>
0038         </Attribute>
0039         <Attribute>
0040             <AttributeName type="TextString" value="Application
Specific Information"/>
0041             <AttributeValue>
0042                 <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0043                 <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
000"/>
0044             </AttributeValue>
0045         </Attribute>
0046         <Attribute>
0047             <AttributeName type="TextString" value="x-Barcode"/>
0048             <AttributeValue type="TextString" value="XXA012A1"/>
0049         </Attribute>
0050         <Attribute>
0051             <AttributeName type="TextString" value="x-
VendorAttribute1"/>
0052             <AttributeValue type="TextString" value="XXA012A1"/>
0053         </Attribute>
0054         <Attribute>
0055             <AttributeName type="TextString" value="x-
VendorAttribute2"/>
0056             <AttributeValue type="Integer" value="0"/>
0057         </Attribute>
0058         <Attribute>
0059             <AttributeName type="TextString" value="x-
VendorAttribute3"/>
0060             <AttributeValue type="DateTime" value="2012-10-
05T22:08:19+00:00"/>
0061         </Attribute>
0062     </TemplateAttribute>
0063 </RequestPayload>
0064 </BatchItem>
0065 <BatchItem>
0066     <Operation type="Enumeration" value="Get"/>
0067     <UniqueBatchItemID type="ByteString" value="02"/>
0068     <RequestPayload>
0069 </RequestPayload>
0070 </BatchItem>
0071 </RequestMessage>
0072 <ResponseMessage>

```



```

0002 <RequestHeader>
0003   <ProtocolVersion>
0004     <ProtocolVersionMajor type="Integer" value="1"/>
0005     <ProtocolVersionMinor type="Integer" value="1"/>
0006   </ProtocolVersion>
0007   <BatchOrderOption type="Boolean" value="true"/>
0008   <BatchCount type="Integer" value="2"/>
0009 </RequestHeader>
0010 <BatchItem>
0011   <Operation type="Enumeration" value="Locate"/>
0012   <UniqueBatchItemID type="ByteString" value="01"/>
0013   <RequestPayload>
0014     <Attribute>
0015       <AttributeName type="TextString" value="Object Type"/>
0016       <AttributeValue type="Enumeration" value="SymmetricKey"/>
0017     </Attribute>
0018     <Attribute>
0019       <AttributeName type="TextString" value="Application Specific
0020 Information"/>
0021       <AttributeValue>
0022         <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0023         <ApplicationData type="TextString"
0024 value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
0025 000"/>
0026       </AttributeValue>
0027     </Attribute>
0028   </RequestPayload>
0029 </BatchItem>
0030 <BatchItem>
0031   <Operation type="Enumeration" value="Get"/>
0032   <UniqueBatchItemID type="ByteString" value="02"/>
0033   <RequestPayload>
0034   </RequestPayload>
0035 </BatchItem>
0036 </RequestMessage>
0037 <ResponseMessage>
0038   <ResponseHeader>
0039     <ProtocolVersion>
0040       <ProtocolVersionMajor type="Integer" value="1"/>
0041       <ProtocolVersionMinor type="Integer" value="1"/>
0042     </ProtocolVersion>
0043     <TimeStamp type="DateTime" value="2012-10-05T22:00:32+00:00"/>
0044     <BatchCount type="Integer" value="2"/>
0045   </ResponseHeader>
0046   <BatchItem>
0047     <Operation type="Enumeration" value="Locate"/>
0048     <UniqueBatchItemID type="ByteString" value="01"/>
0049     <ResultStatus type="Enumeration" value="Success"/>
0050     <ResponsePayload>
0051       <UniqueIdentifier type="TextString"
0052 value="$UNIQUE_IDENTIFIER_0"/>
0053     </ResponsePayload>
0054   </BatchItem>
0055   <BatchItem>
0056     <Operation type="Enumeration" value="Get"/>
0057     <UniqueBatchItemID type="ByteString" value="02"/>
0058     <ResultStatus type="Enumeration" value="Success"/>

```



0105	<ResponseHeader>
0106	<ProtocolVersion>
0107	<ProtocolVersionMajor type="Integer" value="1"/>
0108	<ProtocolVersionMinor type="Integer" value="1"/>
0109	</ProtocolVersion>
0110	<TimeStamp type="DateTime" value="2012-10-05T22:00:33+00:00"/>
0111	<BatchCount type="Integer" value="2"/>
0112	</ResponseHeader>
0113	<BatchItem>
0114	<Operation type="Enumeration" value="Locate"/>
0115	<UniqueBatchItemID type="ByteString" value="01"/>
0116	<ResultStatus type="Enumeration" value="Success"/>
0117	<ResponsePayload>
0118	<UniqueIdentifier type="TextString"
	value="\$UNIQUE_IDENTIFIER_0"/>
0119	</ResponsePayload>
0120	</BatchItem>
0121	<BatchItem>
0122	<Operation type="Enumeration" value="GetAttributeList"/>
0123	<UniqueBatchItemID type="ByteString" value="02"/>
0124	<ResultStatus type="Enumeration" value="Success"/>
0125	<ResponsePayload>
0126	<UniqueIdentifier type="TextString"
	value="\$UNIQUE_IDENTIFIER_0"/>
0127	<AttributeName type="TextString" value="x-ID"/>
0128	<AttributeName type="TextString" value="x-Barcode"/>
0129	<AttributeName type="TextString" value="x-VendorAttribute1"/>
0130	<AttributeName type="TextString" value="x-VendorAttribute2"/>
0131	<AttributeName type="TextString" value="x-VendorAttribute3"/>
0132	<AttributeName type="TextString" value="Unique Identifier"/>
0133	<AttributeName type="TextString" value="Object Type"/>
0134	<AttributeName type="TextString" value="Cryptographic
	Algorithm"/>
0135	<AttributeName type="TextString" value="Cryptographic
	Length"/>
0136	<AttributeName type="TextString" value="Application Specific
	Information"/>
0137	<AttributeName type="TextString" value="Cryptographic Usage
	Mask"/>
0138	<AttributeName type="TextString" value="Digest"/>
0139	<AttributeName type="TextString" value="Initial Date"/>
0140	<AttributeName type="TextString" value="Last Change Date"/>
0141	<AttributeName type="TextString" value="Lease Time"/>
0142	<AttributeName type="TextString" value="Name"/>
0143	<AttributeName type="TextString" value="State"/>
0144	</ResponsePayload>
0145	</BatchItem>
0146	</ResponseMessage>
	<i># TIME 2</i>
0147	<RequestMessage>
0148	<RequestHeader>
0149	<ProtocolVersion>
0150	<ProtocolVersionMajor type="Integer" value="1"/>
0151	<ProtocolVersionMinor type="Integer" value="1"/>
0152	</ProtocolVersion>
0153	<BatchOrderOption type="Boolean" value="true"/>
0154	<BatchCount type="Integer" value="2"/>
0155	</RequestHeader>

```

0156 <BatchItem>
0157   <Operation type="Enumeration" value="Locate"/>
0158   <UniqueBatchItemID type="ByteString" value="01"/>
0159   <RequestPayload>
0160     <Attribute>
0161       <AttributeName type="TextString" value="Object Type"/>
0162       <AttributeValue type="Enumeration" value="SymmetricKey"/>
0163     </Attribute>
0164     <Attribute>
0165       <AttributeName type="TextString" value="Application Specific
Information"/>
0166       <AttributeValue>
0167         <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0168         <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
000"/>
0169       </AttributeValue>
0170     </Attribute>
0171   </RequestPayload>
0172 </BatchItem>
0173 <BatchItem>
0174   <Operation type="Enumeration" value="GetAttributes"/>
0175   <UniqueBatchItemID type="ByteString" value="02"/>
0176   <RequestPayload>
0177 </RequestPayload>
0178 </BatchItem>
0179 </RequestMessage>
0180 <ResponseMessage>
0181   <ResponseHeader>
0182     <ProtocolVersion>
0183       <ProtocolVersionMajor type="Integer" value="1"/>
0184       <ProtocolVersionMinor type="Integer" value="1"/>
0185     </ProtocolVersion>
0186     <TimeStamp type="DateTime" value="2012-10-05T22:00:32+00:00"/>
0187     <BatchCount type="Integer" value="2"/>
0188   </ResponseHeader>
0189   <BatchItem>
0190     <Operation type="Enumeration" value="Locate"/>
0191     <UniqueBatchItemID type="ByteString" value="01"/>
0192     <ResultStatus type="Enumeration" value="Success"/>
0193     <ResponsePayload>
0194       <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0195     </ResponsePayload>
0196   </BatchItem>
0197   <BatchItem>
0198     <Operation type="Enumeration" value="GetAttributes"/>
0199     <UniqueBatchItemID type="ByteString" value="02"/>
0200     <ResultStatus type="Enumeration" value="Success"/>
0201     <ResponsePayload>
0202       <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0203     <Attribute>
0204       <AttributeName type="TextString" value="x-ID"/>
0205       <AttributeValue type="TextString" value="TL-M-2-11"/>
0206     </Attribute>
0207   </BatchItem>

```

```

0208     <AttributeName type="TextString" value="x-
VendorAttribute1"/>
0209     <AttributeValue type="TextString" value="XXA012A1"/>
0210     </Attribute>
0211     <Attribute>
0212     <AttributeName type="TextString" value="x-
VendorAttribute2"/>
0213     <AttributeValue type="Integer" value="0"/>
0214     </Attribute>
0215     <Attribute>
0216     <AttributeName type="TextString" value="x-
VendorAttribute3"/>
0217     <AttributeValue type="DateTime" value="2012-10-
05T22:08:19+00:00"/>
0218     </Attribute>
0219     <Attribute>
0220     <AttributeName type="TextString" value="Unique Identifier"/>
0221     <AttributeValue type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0222     </Attribute>
0223     <Attribute>
0224     <AttributeName type="TextString" value="Object Type"/>
0225     <AttributeValue type="Enumeration" value="SymmetricKey"/>
0226     </Attribute>
0227     <Attribute>
0228     <AttributeName type="TextString" value="Cryptographic
Algorithm"/>
0229     <AttributeValue type="Enumeration" value="AES"/>
0230     </Attribute>
0231     <Attribute>
0232     <AttributeName type="TextString" value="Cryptographic
Length"/>
0233     <AttributeValue type="Integer" value="256"/>
0234     </Attribute>
0235     <Attribute>
0236     <AttributeName type="TextString" value="Application Specific
Information"/>
0237     <AttributeValue>
0238     <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0239     <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
000"/>
0240     </AttributeValue>
0241     </Attribute>
0242     <Attribute>
0243     <AttributeName type="TextString" value="Cryptographic Usage
Mask"/>
0244     <AttributeValue type="Integer" value="Decrypt Encrypt"/>
0245     </Attribute>
0246     <Attribute>
0247     <AttributeName type="TextString" value="Digest"/>
0248     <AttributeValue>
0249     <HashingAlgorithm type="Enumeration" value="SHA_256"/>
0250     <DigestValue type="ByteString"
value="0bd3d7ada745e4eb34cc9d26cc84d4852a15906b2f77f80d01fc31c28108c
49b"/>
0251     <KeyFormatType type="Enumeration" value="Raw"/>

```

```

0252     </AttributeValue>
0253     </Attribute>
0254     <Attribute>
0255         <AttributeName type="TextString" value="Fresh"/>
0256         <AttributeValue type="Boolean" value="false"/>
0257     </Attribute>
0258     <Attribute>
0259         <AttributeName type="TextString" value="Initial Date"/>
0260         <AttributeValue type="DateTime" value="2012-10-
0261 05T21:41:46+00:00"/>
0262     </Attribute>
0263     <Attribute>
0264         <AttributeName type="TextString" value="Last Change Date"/>
0265         <AttributeValue type="DateTime" value="2012-10-
0266 05T21:41:46+00:00"/>
0267     </Attribute>
0268     <Attribute>
0269         <AttributeName type="TextString" value="Lease Time"/>
0270         <AttributeValue type="Interval" value="3600"/>
0271     </Attribute>
0272     <Attribute>
0273         <AttributeName type="TextString" value="Name"/>
0274         <AttributeValue>
0275             <NameValue type="TextString"
0276 value="AAAAAAAAA1A1AA12345678901234567"/>
0277             <NameType type="Enumeration"
0278 value="UninterpretedTextString"/>
0279         </AttributeValue>
0280     </Attribute>
0281 </ResponsePayload>
0282 </BatchItem>
0283 </ResponseMessage>
# TIME 3
0284 <RequestMessage>
0285     <RequestHeader>
0286         <ProtocolVersion>
0287             <ProtocolVersionMajor type="Integer" value="1"/>
0288             <ProtocolVersionMinor type="Integer" value="1"/>
0289         </ProtocolVersion>
0290         <BatchOrderOption type="Boolean" value="true"/>
0291         <BatchCount type="Integer" value="3"/>
0292     </RequestHeader>
0293     <BatchItem>
0294         <Operation type="Enumeration" value="Locate"/>
0295         <UniqueBatchItemID type="ByteString" value="01"/>
0296     <RequestPayload>
0297         <Attribute>
0298             <AttributeName type="TextString" value="Object Type"/>
0299             <AttributeValue type="Enumeration" value="SymmetricKey"/>
0300         </Attribute>
0301         <Attribute>
0302             <AttributeName type="TextString" value="Application Specific
0303 Information"/>
0303             <AttributeValue>

```



```

0304         <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0305         <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
000"/>
0306         </AttributeValue>
0307         </Attribute>
0308         </RequestPayload>
0309     </BatchItem>
0310 <BatchItem>
0311     <Operation type="Enumeration" value="ModifyAttribute"/>
0312     <UniqueBatchItemID type="ByteString" value="02"/>
0313     <RequestPayload>
0314         <Attribute>
0315             <AttributeName type="TextString" value="x-
VendorAttribute2"/>
0316             <AttributeValue type="DateTime" value="2012-10-
05T22:27:06+00:00"/>
0317             </Attribute>
0318         </RequestPayload>
0319     </BatchItem>
0320 <BatchItem>
0321     <Operation type="Enumeration" value="ModifyAttribute"/>
0322     <UniqueBatchItemID type="ByteString" value="03"/>
0323     <RequestPayload>
0324         <Attribute>
0325             <AttributeName type="TextString" value="x-
VendorAttribute3"/>
0326             <AttributeValue type="Integer" value="1"/>
0327             </Attribute>
0328         </RequestPayload>
0329     </BatchItem>
0330 </RequestMessage>
0331 <ResponseMessage>
0332     <ResponseHeader>
0333         <ProtocolVersion>
0334             <ProtocolVersionMajor type="Integer" value="1"/>
0335             <ProtocolVersionMinor type="Integer" value="1"/>
0336         </ProtocolVersion>
0337         <TimeStamp type="DateTime" value="2012-10-05T22:00:33+00:00"/>
0338         <BatchCount type="Integer" value="3"/>
0339     </ResponseHeader>
0340     <BatchItem>
0341         <Operation type="Enumeration" value="Locate"/>
0342         <UniqueBatchItemID type="ByteString" value="01"/>
0343         <ResultStatus type="Enumeration" value="Success"/>
0344         <ResponsePayload>
0345             <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0346         </ResponsePayload>
0347     </BatchItem>
0348     <BatchItem>
0349         <Operation type="Enumeration" value="ModifyAttribute"/>
0350         <UniqueBatchItemID type="ByteString" value="02"/>
0351         <ResultStatus type="Enumeration" value="Success"/>
0352         <ResponsePayload>
0353             <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>

```

0354	<Attribute>
0355	<AttributeName type="TextString" value="x- VendorAttribute2"/>
0356	<AttributeValue type="DateTime" value="2012-10- 05T22:27:06+00:00"/>
0357	</Attribute>
0358	</ResponsePayload>
0359	</BatchItem>
0360	<BatchItem>
0361	<Operation type="Enumeration" value="ModifyAttribute"/>
0362	<UniqueBatchItemID type="ByteString" value="03"/>
0363	<ResultStatus type="Enumeration" value="Success"/>
0364	<ResponsePayload>
0365	<UniqueIdentifier type="TextString" value="\$UNIQUE_IDENTIFIER_0"/>
0366	<Attribute>
0367	<AttributeName type="TextString" value="x- VendorAttribute3"/>
0368	<AttributeValue type="Integer" value="1"/>
0369	</Attribute>
0370	</ResponsePayload>
0371	</BatchItem>
0372	</ResponseMessage>
# TIME 4	
0373	<RequestMessage>
0374	<RequestHeader>
0375	<ProtocolVersion>
0376	<ProtocolVersionMajor type="Integer" value="1"/>
0377	<ProtocolVersionMinor type="Integer" value="1"/>
0378	</ProtocolVersion>
0379	<BatchCount type="Integer" value="1"/>
0380	</RequestHeader>
0381	<BatchItem>
0382	<Operation type="Enumeration" value="Destroy"/>
0383	<RequestPayload>
0384	<UniqueIdentifier type="TextString" value="\$UNIQUE_IDENTIFIER_0"/>
0385	</RequestPayload>
0386	</BatchItem>
0387	</RequestMessage>
0388	<ResponseMessage>
0389	<ResponseHeader>
0390	<ProtocolVersion>
0391	<ProtocolVersionMajor type="Integer" value="1"/>
0392	<ProtocolVersionMinor type="Integer" value="1"/>
0393	</ProtocolVersion>
0394	<TimeStamp type="DateTime" value="2012-10-05T22:00:33+00:00"/>
0395	<BatchCount type="Integer" value="1"/>
0396	</ResponseHeader>
0397	<BatchItem>
0398	<Operation type="Enumeration" value="Destroy"/>
0399	<ResultStatus type="Enumeration" value="Success"/>
0400	<ResponsePayload>
0401	<UniqueIdentifier type="TextString" value="\$UNIQUE_IDENTIFIER_0"/>
0402	</ResponsePayload>
0403	</BatchItem>
0404	</ResponseMessage>

265 **3.1.7 TL-M-1-12 - Configuration**

266 Determine server configuration details including operations supported (only the mandatory operations are  
 267 listed in the response example), objects supported (only the mandatory objects types are listed in the  
 268 response example), optional server information, and optional list of application name spaces.

```

0001 # TIME 0
0001 <RequestMessage>
0002   <RequestHeader>
0003     <ProtocolVersion>
0004       <ProtocolVersionMajor type="Integer" value="1"/>
0005       <ProtocolVersionMinor type="Integer" value="2"/>
0006     </ProtocolVersion>
0007     <BatchCount type="Integer" value="1"/>
0008   </RequestHeader>
0009   <BatchItem>
0010     <Operation type="Enumeration" value="Query"/>
0011     <UniqueBatchItemID type="ByteString" value="01"/>
0012     <RequestPayload>
0013       <QueryFunction type="Enumeration" value="QueryOperations"/>
0014       <QueryFunction type="Enumeration" value="QueryObjects"/>
0015       <QueryFunction type="Enumeration"
0016 value="QueryServerInformation"/>
0016       <QueryFunction type="Enumeration"
0017 value="QueryApplicationNamespaces"/>
0017     </RequestPayload>
0018   </BatchItem>
0019 </RequestMessage>
0020 <ResponseMessage>
0021   <ResponseHeader>
0022     <ProtocolVersion>
0023       <ProtocolVersionMajor type="Integer" value="1"/>
0024       <ProtocolVersionMinor type="Integer" value="2"/>
0025     </ProtocolVersion>
0026     <TimeStamp type="DateTime" value="2012-10-05T21:35:17+00:00"/>
0027     <BatchCount type="Integer" value="1"/>
0028   </ResponseHeader>
0029   <BatchItem>
0030     <Operation type="Enumeration" value="Query"/>
0031     <UniqueBatchItemID type="ByteString" value="01"/>
0032     <ResultStatus type="Enumeration" value="Success"/>
0033     <ResponsePayload>
0034       <Operation type="Enumeration" value="Query"/>
0035       <Operation type="Enumeration" value="Locate"/>
0036       <Operation type="Enumeration" value="Destroy"/>
0037       <Operation type="Enumeration" value="Get"/>
0038       <Operation type="Enumeration" value="Create"/>
0039       <Operation type="Enumeration" value="Register"/>
0040       <Operation type="Enumeration" value="GetAttributes"/>
0041       <Operation type="Enumeration" value="GetAttributeList"/>
0042       <Operation type="Enumeration" value="AddAttribute"/>
0043       <Operation type="Enumeration" value="ModifyAttribute"/>
0044       <Operation type="Enumeration" value="DeleteAttribute"/>
0045       <Operation type="Enumeration" value="Activate"/>
0046       <Operation type="Enumeration" value="Revoke"/>
0047       <Operation type="Enumeration" value="Check"/>

```

```

0048     <ObjectType type="Enumeration" value="SymmetricKey"/>
0049     <ObjectType type="Enumeration" value="Template"/>
0050     <VendorIdentification type="TextString" value="server-
vendor.com"/>
0051     <ServerInformation>
0052     </ServerInformation>
0053     </ResponsePayload>
0054     </BatchItem>
0055     </ResponseMessage>

```

269

### 270 3.1.8 TL-M-2-12 - Write with new (created) key

271 This case may occur when the Write operation starts with the first block on a tape. The implementation  
272 may choose which Write operations qualify for creation of a new key. Regardless of the initiating  
273 circumstances, the Tape Library requests the server to create a new AES-256 symmetric key with  
274 appropriate identifying information which is unique within the Application Namespace.

275 Additional custom attributes MAY be specified in order to:

- 276 - ensure uniqueness of the key identifier when later Locating the key via ASI
- 277 - provide human-readable information (such as the tape Barcode value)
- 278 - provide information to support client-specific purposes

```

# TIME 0
0001 <RequestMessage>
0002   <RequestHeader>
0003     <ProtocolVersion>
0004       <ProtocolVersionMajor type="Integer" value="1"/>
0005       <ProtocolVersionMinor type="Integer" value="2"/>
0006     </ProtocolVersion>
0007     <BatchOrderOption type="Boolean" value="true"/>
0008     <BatchCount type="Integer" value="2"/>
0009   </RequestHeader>
0010   <BatchItem>
0011     <Operation type="Enumeration" value="Create"/>
0012     <UniqueBatchItemID type="ByteString" value="01"/>
0013     <RequestPayload>
0014       <ObjectType type="Enumeration" value="SymmetricKey"/>
0015       <TemplateAttribute>
0016         <Attribute>
0017           <AttributeName type="TextString" value="x-ID"/>
0018           <AttributeValue type="TextString" value="TL-M-2-12"/>
0019         </Attribute>
0020         <Attribute>
0021           <AttributeName type="TextString" value="Alternative
Name"/>
0022           <AttributeValue>
0023             <AlternativeNameValue type="TextString"
value="XXA012A1"/>
0024             <AlternativeNameType type="Enumeration"
value="UninterpretedTextString"/>
0025           </AttributeValue>
0026         </Attribute>
0027         <Attribute>
0028           <AttributeName type="TextString" value="Name"/>
0029           <AttributeValue>
0030             <NameValue type="TextString"
value="AAAAAAA1A1AA12345678901234567"/>

```

```

0031         <NameType type="Enumeration"
value="UninterpretedTextString"/>
0032         </AttributeValue>
0033         </Attribute>
0034         <Attribute>
0035             <AttributeName type="TextString" value="Cryptographic
Algorithm"/>
0036             <AttributeValue type="Enumeration" value="AES"/>
0037             </Attribute>
0038             <Attribute>
0039                 <AttributeName type="TextString" value="Cryptographic
Length"/>
0040                 <AttributeValue type="Integer" value="256"/>
0041                 </Attribute>
0042                 <Attribute>
0043                     <AttributeName type="TextString" value="Cryptographic
Usage Mask"/>
0044                     <AttributeValue type="Integer" value="Decrypt Encrypt"/>
0045                     </Attribute>
0046                     <Attribute>
0047                         <AttributeName type="TextString" value="Application
Specific Information"/>
0048                         <AttributeValue>
0049                             <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0050                             <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
000"/>
0051                             </AttributeValue>
0052                         </Attribute>
0053                     <Attribute>
0054                         <AttributeName type="TextString" value="x-Barcode"/>
0055                         <AttributeValue type="TextString" value="XXA012A1"/>
0056                         </Attribute>
0057                     <Attribute>
0058                         <AttributeName type="TextString" value="x-
VendorAttribute1"/>
0059                         <AttributeValue type="TextString" value="XXA012A1"/>
0060                         </Attribute>
0061                     <Attribute>
0062                         <AttributeName type="TextString" value="x-
VendorAttribute2"/>
0063                         <AttributeValue type="Integer" value="0"/>
0064                         </Attribute>
0065                     <Attribute>
0066                         <AttributeName type="TextString" value="x-
VendorAttribute3"/>
0067                         <AttributeValue type="DateTime" value="2012-10-
05T22:08:19+00:00"/>
0068                         </Attribute>
0069                     </TemplateAttribute>
0070                 </RequestPayload>
0071             </BatchItem>
0072             <BatchItem>
0073                 <Operation type="Enumeration" value="Get"/>
0074                 <UniqueBatchItemID type="ByteString" value="02"/>
0075                 <RequestPayload>
0076                 </RequestPayload>

```



```

# TIME 0
0001 <RequestMessage>
0002   <RequestHeader>
0003     <ProtocolVersion>
0004       <ProtocolVersionMajor type="Integer" value="1"/>
0005       <ProtocolVersionMinor type="Integer" value="2"/>
0006     </ProtocolVersion>
0007     <BatchOrderOption type="Boolean" value="true"/>
0008     <BatchCount type="Integer" value="2"/>
0009   </RequestHeader>
0010   <BatchItem>
0011     <Operation type="Enumeration" value="Locate"/>
0012     <UniqueBatchItemID type="ByteString" value="01"/>
0013     <RequestPayload>
0014       <Attribute>
0015         <AttributeName type="TextString" value="Object Type"/>
0016         <AttributeValue type="Enumeration" value="SymmetricKey"/>
0017       </Attribute>
0018       <Attribute>
0019         <AttributeName type="TextString" value="Application Specific
Information"/>
0020         <AttributeValue>
0021           <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0022           <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
000"/>
0023         </AttributeValue>
0024       </Attribute>
0025     </RequestPayload>
0026   </BatchItem>
0027   <BatchItem>
0028     <Operation type="Enumeration" value="Get"/>
0029     <UniqueBatchItemID type="ByteString" value="02"/>
0030     <RequestPayload>
0031     </RequestPayload>
0032   </BatchItem>
0033 </RequestMessage>
0034 <ResponseMessage>
0035   <ResponseHeader>
0036     <ProtocolVersion>
0037       <ProtocolVersionMajor type="Integer" value="1"/>
0038       <ProtocolVersionMinor type="Integer" value="2"/>
0039     </ProtocolVersion>
0040     <TimeStamp type="DateTime" value="2012-10-05T22:00:32+00:00"/>
0041     <BatchCount type="Integer" value="2"/>
0042   </ResponseHeader>
0043   <BatchItem>
0044     <Operation type="Enumeration" value="Locate"/>
0045     <UniqueBatchItemID type="ByteString" value="01"/>
0046     <ResultStatus type="Enumeration" value="Success"/>
0047     <ResponsePayload>
0048       <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0049     </ResponsePayload>
0050   </BatchItem>
0051   <BatchItem>
0052     <Operation type="Enumeration" value="Get"/>

```





0103	</RequestMessage>
0104	<ResponseMessage>
0105	<ResponseHeader>
0106	<ProtocolVersion>
0107	<ProtocolVersionMajor type="Integer" value="1"/>
0108	<ProtocolVersionMinor type="Integer" value="2"/>
0109	</ProtocolVersion>
0110	<TimeStamp type="DateTime" value="2012-10-05T22:00:33+00:00"/>
0111	<BatchCount type="Integer" value="2"/>
0112	</ResponseHeader>
0113	<BatchItem>
0114	<Operation type="Enumeration" value="Locate"/>
0115	<UniqueBatchItemID type="ByteString" value="01"/>
0116	<ResultStatus type="Enumeration" value="Success"/>
0117	<ResponsePayload>
0118	<UniqueIdentifier type="TextString"
0119	value="\$UNIQUE_IDENTIFIER_0"/>
0120	</ResponsePayload>
0121	</BatchItem>
0122	<BatchItem>
0123	<Operation type="Enumeration" value="GetAttributeList"/>
0124	<UniqueBatchItemID type="ByteString" value="02"/>
0125	<ResultStatus type="Enumeration" value="Success"/>
0126	<ResponsePayload>
0127	<UniqueIdentifier type="TextString"
0128	value="\$UNIQUE_IDENTIFIER_0"/>
0129	<AttributeName type="TextString" value="x-ID"/>
0130	<AttributeName type="TextString" value="x-Barcode"/>
0131	<AttributeName type="TextString" value="x-VendorAttribute1"/>
0132	<AttributeName type="TextString" value="x-VendorAttribute2"/>
0133	<AttributeName type="TextString" value="x-VendorAttribute3"/>
0134	<AttributeName type="TextString" value="Unique Identifier"/>
0135	<AttributeName type="TextString" value="Object Type"/>
0136	<AttributeName type="TextString" value="Cryptographic
0137	Algorithm"/>
0138	<AttributeName type="TextString" value="Cryptographic
0139	Length"/>
0140	<AttributeName type="TextString" value="Application Specific
0141	Information"/>
0142	<AttributeName type="TextString" value="Cryptographic Usage
0143	Mask"/>
0144	<AttributeName type="TextString" value="Digest"/>
0145	<AttributeName type="TextString" value="Initial Date"/>
0146	<AttributeName type="TextString" value="Last Change Date"/>
0147	<AttributeName type="TextString" value="Lease Time"/>
0148	<AttributeName type="TextString" value="Name"/>
0149	<AttributeName type="TextString" value="Original Creation
0150	Date"/>
0151	<AttributeName type="TextString" value="State"/>
0152	</ResponsePayload>
	</BatchItem>
	</ResponseMessage>
	# TIME 2
0148	<RequestMessage>
0149	<RequestHeader>
0150	<ProtocolVersion>
0151	<ProtocolVersionMajor type="Integer" value="1"/>
0152	<ProtocolVersionMinor type="Integer" value="2"/>

```

0153     </ProtocolVersion>
0154     <BatchOrderOption type="Boolean" value="true"/>
0155     <BatchCount type="Integer" value="2"/>
0156 </RequestHeader>
0157 <BatchItem>
0158     <Operation type="Enumeration" value="Locate"/>
0159     <UniqueBatchItemID type="ByteString" value="01"/>
0160     <RequestPayload>
0161         <Attribute>
0162             <AttributeName type="TextString" value="Object Type"/>
0163             <AttributeValue type="Enumeration" value="SymmetricKey"/>
0164         </Attribute>
0165         <Attribute>
0166             <AttributeName type="TextString" value="Application Specific
Information"/>
0167             <AttributeValue>
0168                 <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0169                 <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
000"/>
0170             </AttributeValue>
0171         </Attribute>
0172     </RequestPayload>
0173 </BatchItem>
0174 <BatchItem>
0175     <Operation type="Enumeration" value="GetAttributes"/>
0176     <UniqueBatchItemID type="ByteString" value="02"/>
0177     <RequestPayload>
0178     </RequestPayload>
0179 </BatchItem>
0180 </RequestMessage>
0181 <ResponseMessage>
0182 <ResponseHeader>
0183     <ProtocolVersion>
0184         <ProtocolVersionMajor type="Integer" value="1"/>
0185         <ProtocolVersionMinor type="Integer" value="2"/>
0186     </ProtocolVersion>
0187     <TimeStamp type="DateTime" value="2012-10-05T22:00:32+00:00"/>
0188     <BatchCount type="Integer" value="2"/>
0189 </ResponseHeader>
0190 <BatchItem>
0191     <Operation type="Enumeration" value="Locate"/>
0192     <UniqueBatchItemID type="ByteString" value="01"/>
0193     <ResultStatus type="Enumeration" value="Success"/>
0194     <ResponsePayload>
0195         <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0196     </ResponsePayload>
0197 </BatchItem>
0198 <BatchItem>
0199     <Operation type="Enumeration" value="GetAttributes"/>
0200     <UniqueBatchItemID type="ByteString" value="02"/>
0201     <ResultStatus type="Enumeration" value="Success"/>
0202     <ResponsePayload>
0203         <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0204     </Attribute>

```

```

0205     <AttributeName type="TextString" value="x-ID"/>
0206     <AttributeValue type="TextString" value="TL-M-2-12"/>
0207 </Attribute>
0208 <Attribute>
0209     <AttributeName type="TextString" value="x-Barcode"/>
0210     <AttributeValue type="TextString" value="XXA012A1"/>
0211 </Attribute>
0212 <Attribute>
0213     <AttributeName type="TextString" value="x-
VendorAttribute1"/>
0214     <AttributeValue type="TextString" value="XXA012A1"/>
0215 </Attribute>
0216 <Attribute>
0217     <AttributeName type="TextString" value="x-
VendorAttribute2"/>
0218     <AttributeValue type="Integer" value="0"/>
0219 </Attribute>
0220 <Attribute>
0221     <AttributeName type="TextString" value="x-
VendorAttribute3"/>
0222     <AttributeValue type="DateTime" value="2012-10-
05T22:08:19+00:00"/>
0223 </Attribute>
0224 <Attribute>
0225     <AttributeName type="TextString" value="Unique Identifier"/>
0226     <AttributeValue type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0227 </Attribute>
0228 <Attribute>
0229     <AttributeName type="TextString" value="Object Type"/>
0230     <AttributeValue type="Enumeration" value="SymmetricKey"/>
0231 </Attribute>
0232 <Attribute>
0233     <AttributeName type="TextString" value="Cryptographic
Algorithm"/>
0234     <AttributeValue type="Enumeration" value="AES"/>
0235 </Attribute>
0236 <Attribute>
0237     <AttributeName type="TextString" value="Cryptographic
Length"/>
0238     <AttributeValue type="Integer" value="256"/>
0239 </Attribute>
0240 <Attribute>
0241     <AttributeName type="TextString" value="Alternative Name"/>
0242     <AttributeValue>
0243     <AlternativeNameValue type="TextString" value="XXA012A1"/>
0244     <AlternativeNameType type="Enumeration"
value="UninterpretedTextString"/>
0245     </AttributeValue>
0246 </Attribute>
0247 <Attribute>
0248     <AttributeName type="TextString" value="Application Specific
Information"/>
0249     <AttributeValue>
0250     <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0251     <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000

```

```

000"/>
0252     </AttributeValue>
0253     </Attribute>
0254     <Attribute>
0255         <AttributeName type="TextString" value="Cryptographic Usage
Mask"/>
0256         <AttributeValue type="Integer" value="Decrypt Encrypt"/>
0257     </Attribute>
0258     <Attribute>
0259         <AttributeName type="TextString" value="Digest"/>
0260         <AttributeValue>
0261             <HashingAlgorithm type="Enumeration" value="SHA 256"/>
0262             <DigestValue type="ByteString"
value="0bd3d7ada745e4eb34cc9d26cc84d4852a15906b2f77f80d01fc31c28108c
49b"/>
0263             <KeyFormatType type="Enumeration" value="Raw"/>
0264         </AttributeValue>
0265     </Attribute>
0266     <Attribute>
0267         <AttributeName type="TextString" value="Fresh"/>
0268         <AttributeValue type="Boolean" value="false"/>
0269     </Attribute>
0270     <Attribute>
0271         <AttributeName type="TextString" value="Initial Date"/>
0272         <AttributeValue type="DateTime" value="2012-10-
05T21:41:46+00:00"/>
0273     </Attribute>
0274     <Attribute>
0275         <AttributeName type="TextString" value="Last Change Date"/>
0276         <AttributeValue type="DateTime" value="2012-10-
05T21:41:46+00:00"/>
0277     </Attribute>
0278     <Attribute>
0279         <AttributeName type="TextString" value="Lease Time"/>
0280         <AttributeValue type="Interval" value="3600"/>
0281     </Attribute>
0282     <Attribute>
0283         <AttributeName type="TextString" value="Name"/>
0284         <AttributeValue>
0285             <NameValue type="TextString"
value="AAAAAAA1A1AA12345678901234567"/>
0286             <NameType type="Enumeration"
value="UninterpretedTextString"/>
0287         </AttributeValue>
0288     </Attribute>
0289     <Attribute>
0290         <AttributeName type="TextString" value="Original Creation
Date"/>
0291         <AttributeValue type="DateTime" value="2012-10-
05T21:41:46+00:00"/>
0292     </Attribute>
0293     <Attribute>
0294         <AttributeName type="TextString" value="State"/>
0295         <AttributeValue type="Enumeration" value="PreActive"/>
0296     </Attribute>
0297 </ResponsePayload>
0298 </BatchItem>
0299 </ResponseMessage>

```

```

# TIME 3
0300 <RequestMessage>
0301   <RequestHeader>
0302     <ProtocolVersion>
0303       <ProtocolVersionMajor type="Integer" value="1"/>
0304       <ProtocolVersionMinor type="Integer" value="2"/>
0305     </ProtocolVersion>
0306     <BatchOrderOption type="Boolean" value="true"/>
0307     <BatchCount type="Integer" value="3"/>
0308   </RequestHeader>
0309   <BatchItem>
0310     <Operation type="Enumeration" value="Locate"/>
0311     <UniqueBatchItemID type="ByteString" value="01"/>
0312     <RequestPayload>
0313       <Attribute>
0314         <AttributeName type="TextString" value="Object Type"/>
0315         <AttributeValue type="Enumeration" value="SymmetricKey"/>
0316       </Attribute>
0317       <Attribute>
0318         <AttributeName type="TextString" value="Application Specific
Information"/>
0319         <AttributeValue>
0320           <ApplicationNamespace type="TextString" value="LIBRARY-
LTO"/>
0321           <ApplicationData type="TextString"
value="123456789ABCDEF123456789123456789ABCDEF123456789ABCDEF1234000
000"/>
0322         </AttributeValue>
0323       </Attribute>
0324     </RequestPayload>
0325   </BatchItem>
0326   <BatchItem>
0327     <Operation type="Enumeration" value="ModifyAttribute"/>
0328     <UniqueBatchItemID type="ByteString" value="02"/>
0329     <RequestPayload>
0330       <Attribute>
0331         <AttributeName type="TextString" value="x-
VendorAttribute3"/>
0332         <AttributeValue type="DateTime" value="2012-10-
05T22:27:06+00:00"/>
0333       </Attribute>
0334     </RequestPayload>
0335   </BatchItem>
0336   <BatchItem>
0337     <Operation type="Enumeration" value="ModifyAttribute"/>
0338     <UniqueBatchItemID type="ByteString" value="03"/>
0339     <RequestPayload>
0340       <Attribute>
0341         <AttributeName type="TextString" value="x-
VendorAttribute2"/>
0342         <AttributeValue type="Integer" value="1"/>
0343       </Attribute>
0344     </RequestPayload>
0345   </BatchItem>
0346 </RequestMessage>
0347 <ResponseMessage>
0348   <ResponseHeader>
0349     <ProtocolVersion>

```

```

0350     <ProtocolVersionMajor type="Integer" value="1"/>
0351     <ProtocolVersionMinor type="Integer" value="2"/>
0352     </ProtocolVersion>
0353     <TimeStamp type="DateTime" value="2012-10-05T22:00:33+00:00"/>
0354     <BatchCount type="Integer" value="3"/>
0355     </ResponseHeader>
0356     <BatchItem>
0357         <Operation type="Enumeration" value="Locate"/>
0358         <UniqueBatchItemID type="ByteString" value="01"/>
0359         <ResultStatus type="Enumeration" value="Success"/>
0360         <ResponsePayload>
0361             <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0362         </ResponsePayload>
0363     </BatchItem>
0364     <BatchItem>
0365         <Operation type="Enumeration" value="ModifyAttribute"/>
0366         <UniqueBatchItemID type="ByteString" value="02"/>
0367         <ResultStatus type="Enumeration" value="Success"/>
0368         <ResponsePayload>
0369             <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0370             <Attribute>
0371                 <AttributeName type="TextString" value="x-
VendorAttribute3"/>
0372                 <AttributeValue type="DateTime" value="2012-10-
05T22:27:06+00:00"/>
0373             </Attribute>
0374         </ResponsePayload>
0375     </BatchItem>
0376     <BatchItem>
0377         <Operation type="Enumeration" value="ModifyAttribute"/>
0378         <UniqueBatchItemID type="ByteString" value="03"/>
0379         <ResultStatus type="Enumeration" value="Success"/>
0380         <ResponsePayload>
0381             <UniqueIdentifier type="TextString"
value="$UNIQUE_IDENTIFIER_0"/>
0382             <Attribute>
0383                 <AttributeName type="TextString" value="x-
VendorAttribute2"/>
0384                 <AttributeValue type="Integer" value="1"/>
0385             </Attribute>
0386         </ResponsePayload>
0387     </BatchItem>
0388 </ResponseMessage>
# TIME 4
0389 <RequestMessage>
0390     <RequestHeader>
0391         <ProtocolVersion>
0392             <ProtocolVersionMajor type="Integer" value="1"/>
0393             <ProtocolVersionMinor type="Integer" value="2"/>
0394         </ProtocolVersion>
0395         <BatchCount type="Integer" value="1"/>
0396     </RequestHeader>
0397     <BatchItem>
0398         <Operation type="Enumeration" value="Destroy"/>
0399         <RequestPayload>
0400             <UniqueIdentifier type="TextString"

```

0401	value="\$UNIQUE_IDENTIFIER_0"/>
0402	</RequestPayload>
0403	</BatchItem>
0404	</RequestMessage>
0404	<ResponseMessage>
0405	<ResponseHeader>
0406	<ProtocolVersion>
0407	<ProtocolVersionMajor type="Integer" value="1"/>
0408	<ProtocolVersionMinor type="Integer" value="2"/>
0409	</ProtocolVersion>
0410	<TimeStamp type="DateTime" value="2012-10-05T22:00:33+00:00"/>
0411	<BatchCount type="Integer" value="1"/>
0412	</ResponseHeader>
0413	<BatchItem>
0414	<Operation type="Enumeration" value="Destroy"/>
0415	<ResultStatus type="Enumeration" value="Success"/>
0416	<ResponsePayload>
0417	<UniqueIdentifier type="TextString"
0418	value="\$UNIQUE_IDENTIFIER_0"/>
0419	</ResponsePayload>
0420	</BatchItem>
0420	</ResponseMessage>

290

291

292

---

## 293 4 Conformance

### 294 4.1 Conformance Statement

- 295 1. KMIP client and server implementations conformant to this profile: SHALL support the  
296 Authentication Suite conditions (2.1);
- 297 2. SHALL support the Baseline Tape Library conditions (2.2);
- 298 3. SHALL support the Using Application Specific Information for Key Identifiers conditions (2.3);
- 299 4. SHALL support the Using Alternative Name for tape media barcode conditions (2.4); and
- 300 5. SHALL support all the Mandatory Test Cases (3.1) for each supported protocol version (major  
301 and minor).

302

### 303 4.2 Permitted Test Case Variations

304 Whilst the test cases provided in this Profile define the allowed request and response content, some  
305 inherent variations MAY occur and are permitted within a successfully completed test case.

306 Each test case MAY include allowed variations in the description of the test case in addition to the  
307 variations noted in this section.

308 Other variations not explicitly noted in this Profile SHALL be deemed non-conformant.

#### 309 4.2.1 Variable Items

310 An implementation conformant to this Profile MAY vary the following values:

- 311 1. UniqueIdentifier
- 312 2. PrivateKeyUniqueIdentifier
- 313 3. PublicKeyUniqueIdentifier
- 314 4. UniqueBatchItemIdentifier
- 315 5. AsynchronousCorrelationValue
- 316 6. TimeStamp
- 317 7. KeyValue / KeyMaterial including:
  - 318 a. key material content returned for managed cryptographic objects which are generated by  
319 the server
  - 320 b. wrapped versions of keys where the wrapping key is dynamic or the wrapping contains  
321 variable output for each wrap operation
- 322 8. For response containing the output of cryptographic operation in Data / SignatureData/ MACData  
323 / IVCounterNonce where:
  - 324 a. the managed object is generated by the server; or
  - 325 b. the operation inherently contains variable output
- 326 9. For the following DateTime attributes where the value is not specified in the request as a fixed  
327 DateTime value:
  - 328 a. ActivationDate
  - 329 b. ArchiveDate
  - 330 c. CompromiseDate
  - 331 d. CompromiseOccurrenceDate



- 332 e. DeactivationDate
- 333 f. DestroyDate
- 334 g. InitialDate
- 335 h. LastChangeDate
- 336 i. ProtectStartDate
- 337 j. ProcessStopDate
- 338 k. ValidityDate
- 339 l. OriginalCreationDate
- 340 10. LinkedObjectIdentifier
- 341 11. DigestValue
  - 342 a. For those managed cryptographic objects which are dynamically generated
- 343 12. KeyFormatType
  - 344 a. The key format type selected by the server when it creates managed objects
- 345 13. Digest
  - 346 a. The HashingAlgorithm selected by the server when it calculates the digest for a managed
  - 347 object for which it has access to the key material
  - 348 b. The Digest Value
- 349 14. Extensions reported in Query for ExtensionList and ExtensionMap
- 350 15. Application Namespaces reported in Query
- 351 16. Object Types reported in Query other than those noted as required in this profile
- 352 17. Operation Types reported in Query other than those noted as required in this profile (or any
- 353 referenced profile documents)
- 354 18. For TextString attribute values containing test identifiers:
  - 355 a. Additional vendor or application prefixes
- 356 19. Additional attributes beyond those noted in the response

357

358 An implementation conformant to this Profile MAY allow the following response variations:

- 359 1. Object Group values – May or may not return one or more Object Group values not included in
- 360 the requests
- 361 2. y-CustomAttributes – May or may not include additional server-specific associated attributes not
- 362 included in requests
- 363 3. Message Extensions – May or may not include additional (non-critical) vendor extensions
- 364 4. TemplateAttribute – May or may not be included in responses where the Template Attribute
- 365 response is noted as optional in [KMIP-SPEC]
- 366 5. AttributeIndex – May or may not include Attribute Index value where the Attribute Index value is 0
- 367 for Protocol Versions 1.1 and above.
- 368 6. ResultMessage – May or may not be included in responses and the value (if included) may vary
- 369 from the text contained within the test case.
- 370 7. The list of Protocol Versions returned in a DiscoverVersion response may include additional
- 371 protocol versions if the request has not specified a list of client supported Protocol Versions.
- 372 8. VendorIdentification - The value (if included) may vary from the text contained within the test
- 373 case.

## 374 4.2.2 Variable behavior

375 An implementation conformant to this Profile SHALL allow variation of the following behavior:

- 376  
377  
378
1. A test may omit the clean-up requests and responses (containing Revoke and/or Destroy) at the end of the test provided there is a separate mechanism to remove the created objects during testing.
  - 379 2. A test may omit the test identifiers if the client is unable to include them in requests. This includes  
380 the following attributes:
    - 381 a. Name; and
    - 382 b. x-ID
- 383  
384

---

## Appendix A. Acknowledgments

385 The following individuals have participated in the creation of this specification and are gratefully  
386 acknowledged:

387 **Participants:**

388 Hal Aldridge, Sypris Electronics  
389 Mike Allen, Symantec  
390 Gordon Arnold, IBM  
391 Todd Arnold, IBM  
392 Richard Austin, Hewlett-Packard  
393 Lars Bagnert, PrimeKey  
394 Elaine Barker, NIST  
395 Peter Bartok, Venafi, Inc.  
396 Tom Benjamin, IBM  
397 Anthony Berglas, Cryptsoft  
398 Mathias Björkqvist, IBM  
399 Kevin Bocket, Venafi  
400 Anne Bolgert, IBM  
401 Alan Brown, Thales e-Security  
402 Tim Bruce, CA Technologies  
403 Chris Burchett, Credant Technologies, Inc.  
404 Kelley Burgin, National Security Agency  
405 Robert Burns, Thales e-Security  
406 Chuck Castleton, Venafi  
407 Kenli Chong, QuintessenceLabs  
408 John Clark, Hewlett-Packard  
409 Tom Clifford, Symantec Corp.  
410 Doron Cohen, SafeNet, Inc  
411 Tony Cox, Cryptsoft  
412 Russell Dietz, SafeNet, Inc  
413 Graydon Dodson, Lexmark International Inc.  
414 Vinod Duggirala, EMC Corporation  
415 Chris Dunn, SafeNet, Inc.  
416 Michael Duren, Sypris Electronics  
417 James Dzierzanowski, American Express CCoE  
418 Faisal Faruqui, Thales e-Security  
419 Stan Feather, Hewlett-Packard  
420 David Finkelstein, Symantec Corp.  
421 James Fitzgerald, SafeNet, Inc.  
422 Indra Fitzgerald, Hewlett-Packard  
423 Judith Furlong, EMC Corporation  
424 Susan Gleeson, Oracle  
425 Robert Griffin, EMC Corporation  
426 Paul Grojean, Individual  
427 Robert Haas, IBM  
428 Thomas Hardjono, M.I.T.  
429 ChengDong He, Huawei Technologies Co., Ltd.  
430 Steve He, Vormetric  
431 Kurt Heberlein, Hewlett-Packard  
432 Larry Hofer, Emulex Corporation  
433 Maryann Hondo, IBM  
434 Walt Hubis, NetApp  
435 Tim Hudson, Cryptsoft  
436 Jonas Iggbom, Venafi, Inc.

437 Sitaram Inguva, American Express CcoE  
438 Jay Jacobs, Target Corporation  
439 Glen Jaquette, IBM  
440 Mahadev Karadiguddi, NetApp  
441 Greg Kazmierczak, Wave Systems Corp.  
442 Marc Kenig, SafeNet, Inc.  
443 Mark Knight, Thales e-Security  
444 Kathy Kriese, Symantec Corporation  
445 Mark Lambiase, SecureAuth  
446 John Leiseboer, Quintessence Labs  
447 Hal Lockhart, Oracle Corporation  
448 Robert Lockhart, Thales e-Security  
449 Anne Luk, Cryptsoft  
450 Sairam Manidi, Freescale  
451 Luther Martin, Voltage Security  
452 Neil McEvoy, iFOSSF  
453 Marina Milshtein, Individual  
454 Dale Moberg, Axway Software  
455 Jishnu Mukeri, Hewlett-Packard  
456 Bryan Olson, Hewlett-Packard  
457 John Peck, IBM  
458 Rob Philpott, EMC Corporation  
459 Denis Pochuev, SafeNet, Inc.  
460 Reid Poole, Venafi, Inc.  
461 Ajai Puri, SafeNet, Inc.  
462 Saravanan Ramalingam, Thales e-Security  
463 Peter Reed, SafeNet, Inc.  
464 Bruce Rich, IBM  
465 Christina Richards, American Express CcoE  
466 Warren Robbins, Dell  
467 Peter Robinson, EMC Corporation  
468 Scott Rotondo, Oracle  
469 Saikat Saha, SafeNet, Inc.  
470 Anil Saldhana, Red Hat  
471 Subhash Sankuratripati, NetApp  
472 Boris Schumperli, Cryptomathic  
473 Greg Singh, QuintessenceLabs  
474 David Smith, Venafi, Inc  
475 Brian Spector, Certivox  
476 Terence Spies, Voltage Security  
477 Deborah Steckroth, RouteOne LLC  
478 Michael Stevens, QuintessenceLabs  
479 Marcus Streets, Thales e-Security  
480 Satish Sundar, IBM  
481 Kiran Thota, Vmware  
482 Somanchi Trinath, Freescale Semiconductor, Inc.  
483 Nathan Turajski, Thales e-Security  
484 Sean Turner, IECA, Inc.  
485 Paul Turner, Venafi, Inc.  
486 Rod Wideman, Quantum Corporation  
487 Steven Wierenga, Hewlett-Packard  
488 Jin Wong, QuintessenceLabs  
489 Sameer Yami, Thales e-Security  
490 Peter Yee, EMC Corporation  
491 Krishna Yellepeddy, IBM  
492 Catherine Ying, SafeNet, Inc.  
493 Tatu Ylonen, SSH Communications Security (Tectia Corp)

494 Michael Yoder, Vormetric. Inc.  
495 Magda Zdunkiewicz, Cryptsoft  
496 Peter Zelechowski, Election Systems & Software

## Appendix B. KMIP Specification Cross Reference

Reference Term	KMIP 1.0	KMIP 1.1	KMIP 1.2
<b>1 Introduction</b>			
<i>Non-Normative References</i>	1.3.	1.3.	1.3.
<i>Normative References</i>	1.2.	1.2.	1.2.
<i>Terminology</i>	1.1.	1.1.	1.1.
<b>2 Objects</b>			
<i>Attribute</i>	2.1.1.	2.1.1.	2.1.1.
<i>Base Objects</i>	2.1.	2.1.	2.1.
<i>Certificate</i>	2.2.1.	2.2.1.	2.2.1.
<i>Credential</i>	2.1.2.	2.1.2.	2.1.2.
<i>Data</i>	-	-	2.1.10.
<i>Data Length</i>	-	-	2.1.11.
<i>Extension Information</i>	-	2.1.9.	2.1.9.
<i>Key Block</i>	2.1.3.	2.1.3.	2.1.3.
<i>Key Value</i>	2.1.4.	2.1.4.	2.1.4.
<i>Key Wrapping Data</i>	2.1.5.	2.1.5.	2.1.5.
<i>Key Wrapping Specification</i>	2.1.6.	2.1.6.	2.1.6.
<i>MAC Data</i>	-	-	2.1.13.
<i>Managed Objects</i>	2.2.	2.2.	2.2.
<i>Nonce</i>	-	-	2.1.14.
<i>Opaque Object</i>	2.2.8.	2.2.8.	2.2.8.
<i>PGP Key</i>	-	-	2.2.9.
<i>Private Key</i>	2.2.4.	2.2.4.	2.2.4.
<i>Public Key</i>	2.2.3.	2.2.3.	2.2.3.
<i>Secret Data</i>	2.2.7.	2.2.7.	2.2.7.
<i>Signature Data</i>	-	-	2.1.12.
<i>Split Key</i>	2.2.5.	2.2.5.	2.2.5.
<i>Symmetric Key</i>	2.2.2.	2.2.2.	2.2.2.
<i>Template</i>	2.2.6.	2.2.6.	2.2.6.
<i>Template-Attribute Structures</i>	2.1.8.	2.1.8.	2.1.8.
<i>Transparent DH Private Key</i>	2.1.7.6.	2.1.7.6.	2.1.7.6.
<i>Transparent DH Public Key</i>	2.1.7.7.	2.1.7.7.	2.1.7.7.
<i>Transparent DSA Private Key</i>	2.1.7.2.	2.1.7.2.	2.1.7.2.
<i>Transparent DSA Public Key</i>	2.1.7.3.	2.1.7.3.	2.1.7.3.
<i>Transparent ECDH Private Key</i>	2.1.7.10.	2.1.7.10.	2.1.7.10.
<i>Transparent ECDH Public Key</i>	2.1.7.11.	2.1.7.11.	2.1.7.11.
<i>Transparent ECDSA Private Key</i>	2.1.7.8.	2.1.7.8.	2.1.7.8.
<i>Transparent ECDSA Public Key</i>	2.1.7.9.	2.1.7.9.	2.1.7.9.
<i>Transparent ECMQV Private Key</i>	2.1.7.12.	2.1.7.12.	2.1.7.12.
<i>Transparent ECMQV Public Key</i>	2.1.7.13.	2.1.7.13.	2.1.7.13.
<i>Transparent Key Structures</i>	2.1.7.	2.1.7.	2.1.7.
<i>Transparent RSA Private Key</i>	2.1.7.4.	2.1.7.4.	2.1.7.4.
<i>Transparent RSA Public Key</i>	2.1.7.5.	2.1.7.5.	2.1.7.5.
<i>Transparent Symmetric Key</i>	2.1.7.1.	2.1.7.1.	2.1.7.1.
<b>3 Attributes</b>			
<i>Activation Date</i>	3.19.	3.24.	3.24.
<i>Alternative Name</i>	-	-	3.40.
<i>Application Specific Information</i>	3.30.	3.36.	3.36.
<i>Archive Date</i>	3.27.	3.32.	3.32.

<b>Reference Term</b>	<b>KMIP 1.0</b>	<b>KMIP 1.1</b>	<b>KMIP 1.2</b>
<i>Attributes</i>	3	3	3
<i>Certificate Identifier</i>	3.9.	3.13.	3.13.
<i>Certificate Issuer</i>	3.11.	3.15.	3.15.
<i>Certificate Length</i>	-	3.9.	3.9.
<i>Certificate Subject</i>	3.10.	3.14.	3.14.
<i>Certificate Type</i>	3.8.	3.8.	3.8.
<i>Compromise Date</i>	3.25.	3.30.	3.30.
<i>Compromise Occurrence Date</i>	3.24.	3.29.	3.29.
<i>Contact Information</i>	3.31.	3.37.	3.37.
<i>Cryptographic Algorithm</i>	3.4.	3.4.	3.4.
<i>Cryptographic Domain Parameters</i>	3.7.	3.7.	3.7.
<i>Cryptographic Length</i>	3.5.	3.5.	3.5.
<i>Cryptographic Parameters</i>	3.6.	3.6.	3.6.
<i>Custom Attribute</i>	3.33.	3.39.	3.39.
<i>Deactivation Date</i>	3.22.	3.27.	3.27.
<i>Default Operation Policy</i>	3.13.2.	3.18.2.	3.18.2.
<i>Default Operation Policy for Certificates and Public Key Objects</i>	3.13.2.2.	3.18.2.2.	3.18.2.2.
<i>Default Operation Policy for Secret Objects</i>	3.13.2.1.	3.18.2.1.	3.18.2.1.
<i>Default Operation Policy for Template Objects</i>	3.13.2.3.	3.18.2.3.	3.18.2.3.
<i>Destroy Date</i>	3.23.	3.28.	3.28.
<i>Digest</i>	3.12.	3.17.	3.17.
<i>Digital Signature Algorithm</i>	-	3.16.	3.16.
<i>Fresh</i>	-	3.34.	3.34.
<i>Initial Date</i>	3.18.	3.23.	3.23.
<i>Key Value Location</i>	-	-	3.42.
<i>Key Value Present</i>	-	-	3.41.
<i>Last Change Date</i>	3.32.	3.38.	3.38.
<i>Lease Time</i>	3.15.	3.20.	3.20.
<i>Link</i>	3.29.	3.35.	3.35.
<i>Name</i>	3.2.	3.2.	3.2.
<i>Object Group</i>	3.28.	3.33.	3.33.
<i>Object Type</i>	3.3.	3.3.	3.3.
<i>Operation Policy Name</i>	3.13.	3.18.	3.18.
<i>Operations outside of operation policy control</i>	3.13.1.	3.18.1.	3.18.1.
<i>Original Creation Date</i>	-	-	3.43.
<i>Process Start Date</i>	3.20.	3.25.	3.25.
<i>Protect Stop Date</i>	3.21.	3.26.	3.26.
<i>Revocation Reason</i>	3.26.	3.31.	3.31.
<i>State</i>	3.17.	3.22.	3.22.
<i>Unique Identifier</i>	3.1.	3.1.	3.1.
<i>Usage Limits</i>	3.16.	3.21.	3.21.
<i>X.509 Certificate Identifier</i>	-	3.10.	3.10.
<i>X.509 Certificate Issuer</i>	-	3.12.	3.12.
<i>X.509 Certificate Subject</i>	-	3.11.	3.11.
<b>4 Client-to-Server Operations</b>			
<i>Activate</i>	4.18.	4.19.	4.19.
<i>Add Attribute</i>	4.13.	4.14.	4.14.
<i>Archive</i>	4.21.	4.22.	4.22.
<i>Cancel</i>	4.25.	4.27.	4.27.
<i>Certify</i>	4.6.	4.7.	4.7.
<i>Check</i>	4.9.	4.10.	4.10.
<i>Create</i>	4.1.	4.1.	4.1.
<i>Create Key Pair</i>	4.2.	4.2.	4.2.

<b>Reference Term</b>	<b>KMIP 1.0</b>	<b>KMIP 1.1</b>	<b>KMIP 1.2</b>
<i>Create Split Key</i>	-	-	4.38.
<i>Decrypt</i>	-	-	4.30.
<i>Delete Attribute</i>	4.15.	4.16.	4.16.
<i>Derive Key</i>	4.5.	4.6.	4.6.
<i>Destroy</i>	4.20.	4.21.	4.21.
<i>Discover Versions</i>	-	4.26.	4.26.
<i>Encrypt</i>	-	-	4.29.
<i>Get</i>	4.10.	4.11.	4.11.
<i>Get Attribute List</i>	4.12.	4.13.	4.13.
<i>Get Attributes</i>	4.11.	4.12.	4.12.
<i>Get Usage Allocation</i>	4.17.	4.18.	4.18.
<i>Hash</i>	-	-	4.37.
<i>Join Split Key</i>	-	-	4.39.
<i>Locate</i>	4.8.	4.9.	4.9.
<i>MAC</i>	-	-	4.33.
<i>MAC Verify</i>	-	-	4.34.
<i>Modify Attribute</i>	4.14.	4.15.	4.15.
<i>Obtain Lease</i>	4.16.	4.17.	4.17.
<i>Poll</i>	4.26.	4.28.	4.28.
<i>Query</i>	4.24.	4.25.	4.25.
<i>Re-certify</i>	4.7.	4.8.	4.8.
<i>Recover</i>	4.22.	4.23.	4.23.
<i>Register</i>	4.3.	4.3.	4.3.
<i>Re-key</i>	4.4.	4.4.	4.4.
<i>Re-key Key Pair</i>	-	4.5.	4.5.
<i>Revoke</i>	4.19.	4.20.	4.20.
<i>RNG Retrieve</i>	-	-	4.35.
<i>RNG Seed</i>	-	-	4.36.
<i>Sign</i>	-	-	4.31.
<i>Signature Verify</i>	-	-	4.32.
<i>Validate</i>	4.23.	4.24.	4.24.
<b>5 Server-to-Client Operations</b>			
<i>Notify</i>	5.1.	5.1.	5.1.
<i>Put</i>	5.2.	5.2.	5.2.
<b>6 Message Contents</b>			
<i>Asynchronous Correlation Value</i>	6.8.	6.8.	6.8.
<i>Asynchronous Indicator</i>	6.7.	6.7.	6.7.
<i>Attestation Capable Indicator</i>	-	-	6.17.
<i>Batch Count</i>	6.14.	6.14.	6.14.
<i>Batch Error Continuation Option</i>	6.13.	6.13.	6.13.
<i>Batch Item</i>	6.15.	6.15.	6.15.
<i>Batch Order Option</i>	6.12.	6.12.	6.12.
<i>Maximum Response Size</i>	6.3.	6.3.	6.3.
<i>Message Extension</i>	6.16.	6.16.	6.16.
<i>Operation</i>	6.2.	6.2.	6.2.
<i>Protocol Version</i>	6.1.	6.1.	6.1.
<i>Result Message</i>	6.11.	6.11.	6.11.
<i>Result Reason</i>	6.10.	6.10.	6.10.
<i>Result Status</i>	6.9.	6.9.	6.9.
<i>Time Stamp</i>	6.5.	6.5.	6.5.
<i>Unique Batch Item ID</i>	6.4.	6.4.	6.4.
<b>7 Message Format</b>			



<b>Reference Term</b>	<b>KMIP 1.0</b>	<b>KMIP 1.1</b>	<b>KMIP 1.2</b>
<i>Message Structure</i>	7.1.	7.1.	7.1.
<i>Operations</i>	7.2.	7.2.	7.2.
<b>8 Authentication</b>			
<i>Authentication</i>	8	8	8
<b>9 Message Encoding</b>			
<i>Alternative Name Type Enumeration</i>	-	-	9.1.3.2.34.
<i>Attestation Type Enumeration</i>	-	-	9.1.3.2.36.
<i>Batch Error Continuation Option Enumeration</i>	9.1.3.2.29.	9.1.3.2.30.	9.1.3.2.30.
<i>Bit Masks</i>	9.1.3.3.	9.1.3.3.	9.1.3.3.
<i>Block Cipher Mode Enumeration</i>	9.1.3.2.13.	9.1.3.2.14.	9.1.3.2.14.
<i>Cancellation Result Enumeration</i>	9.1.3.2.24.	9.1.3.2.25.	9.1.3.2.25.
<i>Certificate Request Type Enumeration</i>	9.1.3.2.21.	9.1.3.2.22.	9.1.3.2.22.
<i>Certificate Type Enumeration</i>	9.1.3.2.6.	9.1.3.2.6.	9.1.3.2.6.
<i>Credential Type Enumeration</i>	9.1.3.2.1.	9.1.3.2.1.	9.1.3.2.1.
<i>Cryptographic Algorithm Enumeration</i>	9.1.3.2.12.	9.1.3.2.13.	9.1.3.2.13.
<i>Cryptographic Usage Mask</i>	9.1.3.3.1.	9.1.3.3.1.	9.1.3.3.1.
<i>Defined Values</i>	9.1.3.	9.1.3.	9.1.3.
<i>Derivation Method Enumeration</i>	9.1.3.2.20.	9.1.3.2.21.	9.1.3.2.21.
<i>Digital Signature Algorithm Enumeration</i>	-	9.1.3.2.7.	9.1.3.2.7.
<i>Encoding Option Enumeration</i>	-	9.1.3.2.32.	9.1.3.2.32.
<i>Enumerations</i>	9.1.3.2.	9.1.3.2.	9.1.3.2.
<i>Examples</i>	9.1.2.	9.1.2.	9.1.2.
<i>Hashing Algorithm Enumeration</i>	9.1.3.2.15.	9.1.3.2.16.	9.1.3.2.16.
<i>Item Length</i>	9.1.1.3.	9.1.1.3.	9.1.1.3.
<i>Item Tag</i>	9.1.1.1.	9.1.1.1.	9.1.1.1.
<i>Item Type</i>	9.1.1.2.	9.1.1.2.	9.1.1.2.
<i>Item Value</i>	9.1.1.4.	9.1.1.4.	9.1.1.4.
<i>Key Compression Type Enumeration</i>	9.1.3.2.2.	9.1.3.2.2.	9.1.3.2.2.
<i>Key Format Type Enumeration</i>	9.1.3.2.3.	9.1.3.2.3.	9.1.3.2.3.
<i>Key Role Type Enumeration</i>	9.1.3.2.16.	9.1.3.2.17.	9.1.3.2.17.
<i>Key Value Location Type Enumeration</i>	-	-	9.1.3.2.35.
<i>Link Type Enumeration</i>	9.1.3.2.19.	9.1.3.2.20.	9.1.3.2.20.
<i>Name Type Enumeration</i>	9.1.3.2.10.	9.1.3.2.11.	9.1.3.2.11.
<i>Object Group Member Enumeration</i>	-	9.1.3.2.33.	9.1.3.2.33.
<i>Object Type Enumeration</i>	9.1.3.2.11.	9.1.3.2.12.	9.1.3.2.12.
<i>Opaque Data Type Enumeration</i>	9.1.3.2.9.	9.1.3.2.10.	9.1.3.2.10.
<i>Operation Enumeration</i>	9.1.3.2.26.	9.1.3.2.27.	9.1.3.2.27.
<i>Padding Method Enumeration</i>	9.1.3.2.14.	9.1.3.2.15.	9.1.3.2.15.
<i>Put Function Enumeration</i>	9.1.3.2.25.	9.1.3.2.26.	9.1.3.2.26.
<i>Query Function Enumeration</i>	9.1.3.2.23.	9.1.3.2.24.	9.1.3.2.24.
<i>Recommended Curve Enumeration for ECDSA, ECDH, and ECMQV</i>	9.1.3.2.5.	9.1.3.2.5.	9.1.3.2.5.
<i>Result Reason Enumeration</i>	9.1.3.2.28.	9.1.3.2.29.	9.1.3.2.29.
<i>Result Status Enumeration</i>	9.1.3.2.27.	9.1.3.2.28.	9.1.3.2.28.
<i>Revocation Reason Code Enumeration</i>	9.1.3.2.18.	9.1.3.2.19.	9.1.3.2.19.
<i>Secret Data Type Enumeration</i>	9.1.3.2.8.	9.1.3.2.9.	9.1.3.2.9.
<i>Split Key Method Enumeration</i>	9.1.3.2.7.	9.1.3.2.8.	9.1.3.2.8.
<i>State Enumeration</i>	9.1.3.2.17.	9.1.3.2.18.	9.1.3.2.18.
<i>Storage Status Mask</i>	9.1.3.3.2.	9.1.3.3.2.	9.1.3.3.2.
<i>Tags</i>	9.1.3.1.	9.1.3.1.	9.1.3.1.
<i>TTLV Encoding</i>	9.1.	9.1.	9.1.
<i>TTLV Encoding Fields</i>	9.1.1.	9.1.1.	9.1.1.
<i>Usage Limits Unit Enumeration</i>	9.1.3.2.30.	9.1.3.2.31.	9.1.3.2.31.

<b>Reference Term</b>	<b>KMIP 1.0</b>	<b>KMIP 1.1</b>	<b>KMIP 1.2</b>
<i>Validity Indicator Enumeration</i>	9.1.3.2.22.	9.1.3.2.23.	9.1.3.2.23.
<i>Wrapping Method Enumeration</i>	9.1.3.2.4.	9.1.3.2.4.	9.1.3.2.4.
<i>XML Encoding</i>	9.2.	-	-
<b>10 Transport</b>			
<i>Transport</i>	10	10	10
<b>12 KMIP Server and Client Implementation Conformance</b>			
<i>Conformance clauses for a KMIP Server</i>	12.1.	-	-
<i>KMIP Client Implementation Conformance</i>	-	12.2.	12.2.
<i>KMIP Server Implementation Conformance</i>	-	12.1.	12.1.

497

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## Appendix C. Revision History

Revision	Date	Editor	Changes Made
wd01	27-Jun-2013	Tim Hudson / Rod Wideman / Stan Feather	Converted from draft proposal to OASIS template incorporating updates from Stan Feather and inclusion of references to KMIP 1.2 documents. Editorial and formatting cleanup.
wd02	6-August-2013	Tim Hudson	Updated to include Permitted Test Case Variations and updated Test Cases based on July 2013 Interop
wd03	8-August-2013	Stan Feather / Rod Wideman	Editorial changes to section 3
wd04	10-August-2013	Tim Hudson	Updated Permitted Test Case Variations
wd04a	24-October-2013	Tim Hudson	Editorial update to include VendorIdentification in the list of allowed variations as per TC motion.