



WS-Management Examples  
and Mapping Details  
Version 3

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# Agenda

## Agenda Items

- CapabilityNegotiation method casting example
- “1619” and “interop” CIMOM Namespaces

## Future Agenda Items

- WS-CIM XML Schema for 1619 classes
- WS-Man Security Profiles and CryptoSuite selection for interoperability

## Previous Agenda Items

- Where WS-Man Fits (version II)
- “Allied” Approach Implications
- Example: Mapping WS-Man Get to Key Request
- Example: Mapping 1619 Operations to Methods

# 1619 Class Examples

## 1619\_Key

SO\_GUID : string  
STATE : uint  
T\_EXPIRED : time  
T\_DISABLED : time  
T\_CACHED : time  
CIPHER\_TYPE : string  
KEY : embeddedInstance (1619\_KeyBlob)

## 1619\_KeyBlob

Version : uint  
Length : uint  
Data : string

## 1619\_DataSet

Name : string  
SizeOfValue : uint  
Value : string

## 1619\_Service

ServiceName : string = "1619 Key Management Service"  
GenerateKey (  
    ClientID : string {IN},  
    DataSetContext[] : array of embeddedInstance (1619\_DataSet) {IN},  
    Key : embeddedInstance (1619\_Key) {OUT}  
);  
CapabilityNegotiation (  
    ClientID : string {IN},  
    ClientCapabilities[] : array of embeddedInstance (1619\_Capabilities) {IN},  
    ServerCapabilities[] : array of embeddedInstance (1619\_Capabilities) {OUT}  
);

## 1619\_Capabilities

Name : string

# CapabilityNegotiation Method Invocation Example

## - Payload Header (1 of 2 pages)

```
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope" xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://keyserver:80</a:To>
    <w:ResourceURI s:mustUnderstand="true">http://www.ieee1619.org/wscim-schema/1619_Service</w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://www.ieee1619.org/wscim-schema/1619_Service/CapabilityNegotiation
    </a:Action>
    <a:MessageID>uuid:CE118DCA-C500-49B8-98A7-97DB668BE15E</a:MessageID>
    <w:SelectorSet>
      <w:Selector Name="ServiceName">1619 Key Management Service</w:Selector>
      <w:Selector Name="__cimnamespace">1619.3</w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT30.000S</w:OperationTimeout>
  </s:Header>
```

1619\_Service Class  
XML Schema URI

CapabilityNegotiation  
Method XML Schema  
URI

1619\_Service Class  
ServiceName property  
value as selector

1619.3  
Implementation  
Namespace

# CapabilityNegotiation Method Invocation Example

## – Payload Body (2 of 2 pages)

```
<s:Body>
  <p:CapabilityNegotiation_INPUT xmlns:p="http://www.ieee1619.org/wscim-schema/1619_Service"/>
    <p:ClientID>KEY-CLIENT-100</p:ClientID>
    <p:ClientCapabilities>
      <p:Capability xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:p="http://www.ieee1619.org/wscim-schema/1619_Capability"
        xmlns:cim=http://schemas.dmtf.org/wbem/wsman/1/base
        xml:lang="en-US" >
        <p:Name>Capability-1</p:Name>
      </p:Capability>
      <p:Capability xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:p="http://www.ieee1619.org/wscim-schema/1619_Capability"
        xmlns:cim=http://schemas.dmtf.org/wbem/wsman/1/base
        xml:lang="en-US" >
        <p:Name>Capability-2</p:Name>
      </p:Capability>
    </p:ClientCapabilities>
  </p:CapabilityNegotiation_INPUT>
</s:Body>
</s:Envelope>
```

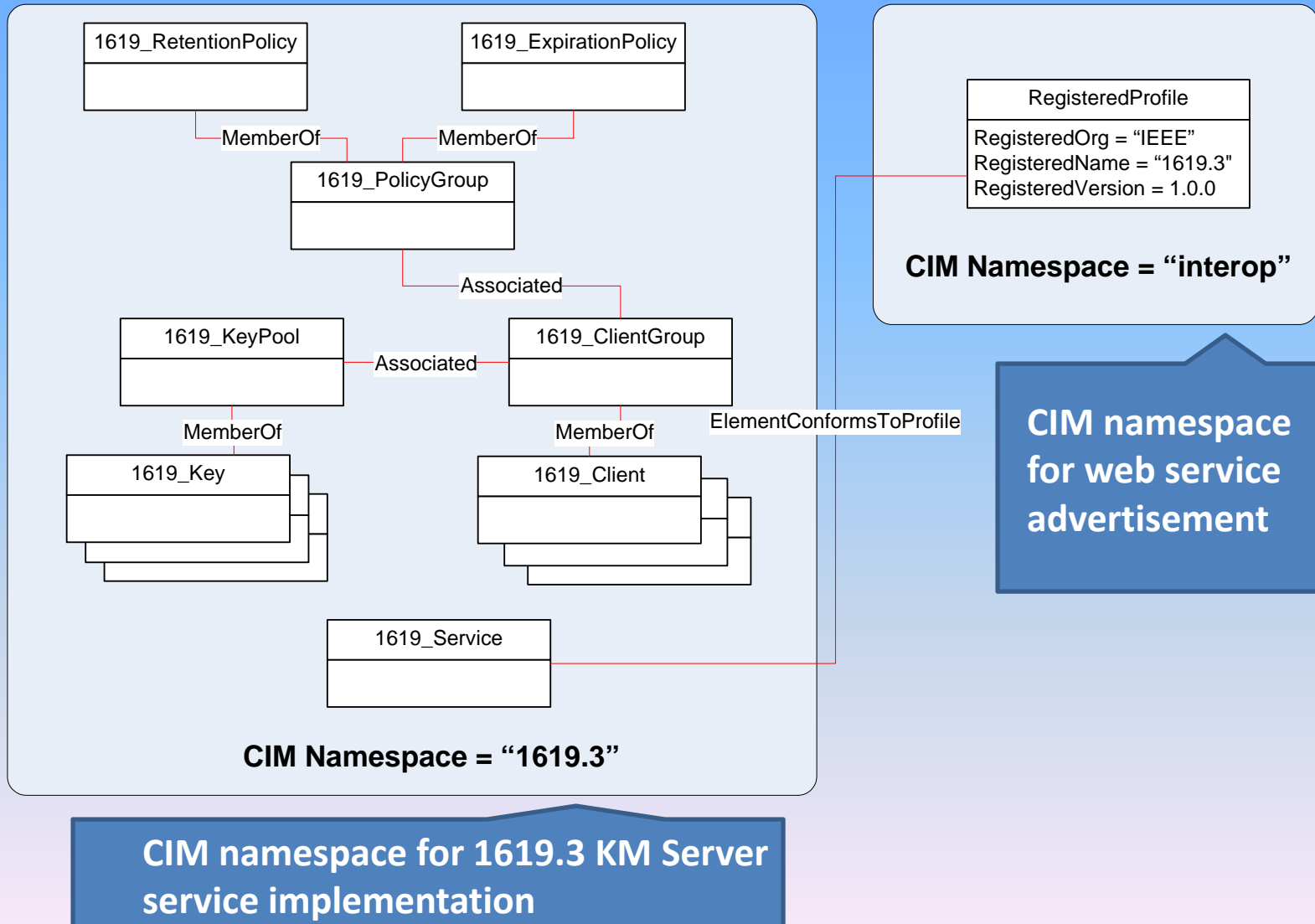
WS-CIM WSDL  
mapping of  
method input  
parameters

1619\_Capability  
Class Schema XML

# CapabilityNegotiation Method Response Example

```
<s:Envelope xml:lang="en-US" xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action >http://www.ieee1619.org/wscim-schema/1619_Service/CapabilityNegotiationResponse</a:Action>
    <a:MessageID >uuid:4E940860-4362-4604-98D4-1C009C2D5E0A</a:MessageID>
    <a:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</a:To>
    <a:RelatesTo >uuid:CE118DCA-C500-49B8-98A7-97DB668BE15E</a:RelatesTo>
  </s:Header>
  <s:Body>
    <p:CapabilityNegotiation_OUTPUT xmlns:p="http://www.ieee1619.org/wscim-schema/1619_Service"
      xmlns:cim="http://schemas.dmtf.org/wbem/wsman/1/base">
      <p:ServerCapabilities>
        <p:Capability xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
          xmlns:p="http://www.ieee1619.org/wscim-schema/1619_Capability"
          xmlns:cim="http://schemas.dmtf.org/wbem/wsman/1/base"
          xml:lang="en-US" >
          <p:Name>Capability-1</p:Name>
        </p:Capability>
        <p:Capability xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
          xmlns:p="http://www.ieee1619.org/wscim-schema/1619_Capability"
          xmlns:cim="http://schemas.dmtf.org/wbem/wsman/1/base"
          xml:lang="en-US" >
          <p:Name>Capability-2</p:Name>
        </p:Capability>
      </p:ServerCapabilities>
      <p:ReturnValue>0</p:ReturnValue>
    </p:CapabilityNegotiation_OUTPUT>
  </s:Body>
</s:Envelope>
```

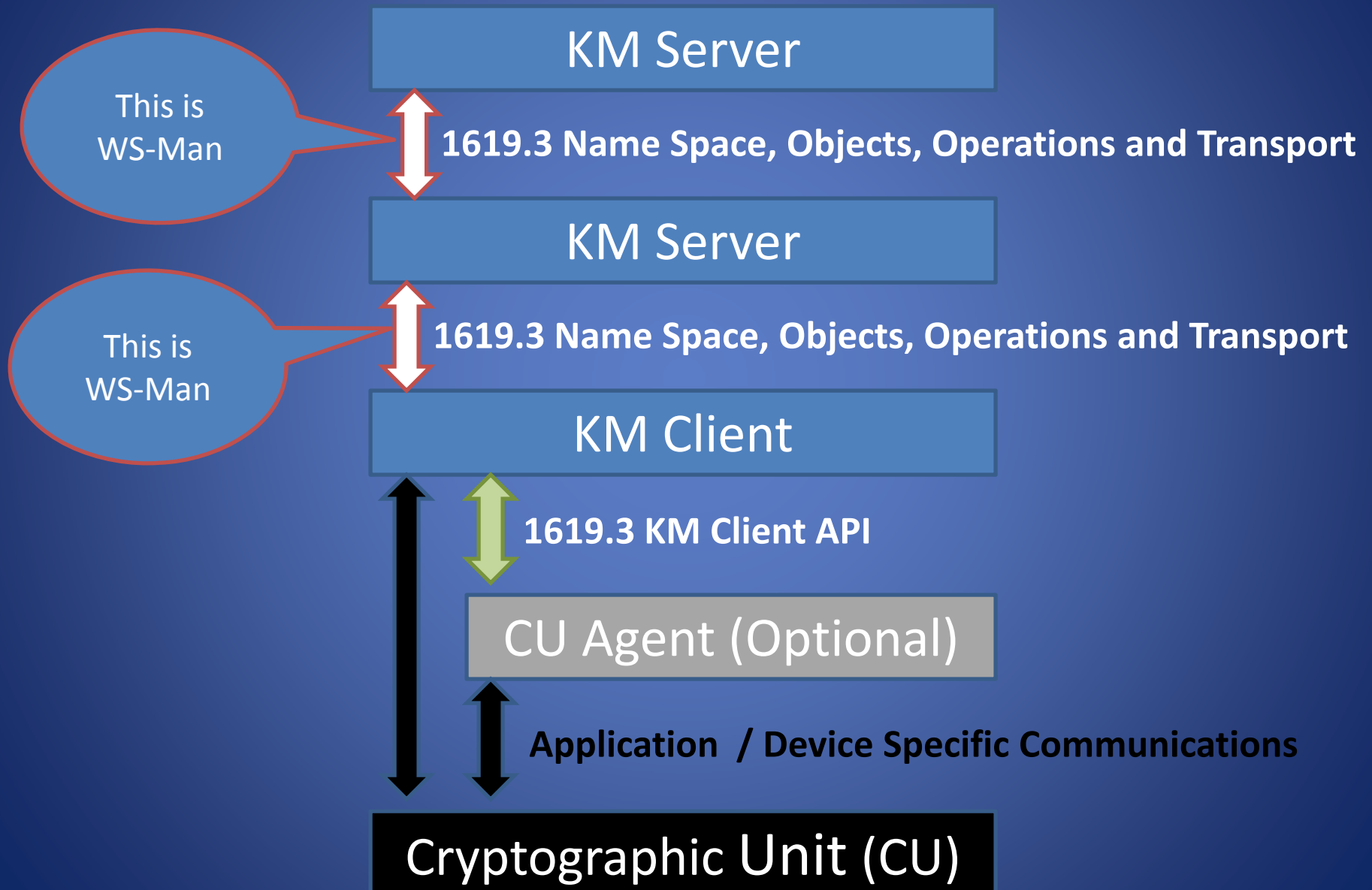
# 1619.3 CIM Namespaces



# Previous Agenda Items

- Where WS-Man Fits (version II)
- “Allied” Approach Implications
- Example: Mapping WS-Man Get to Key Request
- Example: Mapping 1619 Operations to Methods

# Where WS-Management Fits - II



# Implications of WS-CIM “Alliance”

- Subclass 1619.3 objects from CIM\_ManagedElement
  - Provides single root parent object and enables polymorphic enumeration
  - 1619.3 object subclassing
    - Key Object becomes 1619\_Key Object
    - Client Object becomes 1619\_Client Object
    - Retention Policy Object becomes 1619\_RetentionPolicy
    - Etc.
- Map 1619.3 operations
  - To WS-Man operations where semantics apply
  - To methods on 1619\_Service class
    - Extrinsic methods on the service class would map to WSDL in a consistent fashion as defined by WS-CIM Schema Mapping and WS-Management CIM Binding specifications

# 1619 Class Examples

## 1619\_Key

```
SO_GUID : string
STATE : uint
T_EXPIRED : time
T_DISABLED : time
T_CACHED : time
CIPHER_TYPE : string
KEY : embeddedInstance (1619_KeyBlob)
```

## 1619\_KeyBlob

```
Version : uint
Length : uint
Data : string
```

## 1619\_DataSet

```
Name : string
SizeOfValue : uint
Value : string
```

## 1619\_Service

```
ServiceName : string = "1619 Key Management Service"
GenerateKey (
    ClientID : string {IN},
    DataSet : embeddedInstance (1619_DataSet) {IN},
    Key : embeddedInstance (1619_Key) {OUT}
);
```

# Get Key Request Example

## As a WS-Man "Get" Operation

```
<s:Envelope xmlns:s=http://www.w3.org/2003/05/soap-envelope
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://keyserver:80</a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://www.ieee1619.org/wscim-schema/1619_Key
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/transfer/Get
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>uuid:D41A7D37-9A59-45D4-9558-8C5805A229C6</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false"/>
    <w:SelectorSet>
      <w:Selector Name="SO_GUID">THE-KEY-ID</w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
</s:Envelope>
```

IEEE 1619  
Key Object  
Schema XML

WS-Man  
Operation

Requested  
Key ID

# Get Key Response Example

```
<s:Envelope xml:lang="en-US" xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action > http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse</a:Action>
    <a:MessageID >uuid:6FE41695-E872-49FF-9FA8-E7D1EA94A291</a:MessageID>
    <a:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</a:To>
    <a:RelatesTo >uuid:D41A7D37-9A59-45D4-9558-8C5805A229C6</a:RelatesTo>
  </s:Header>
  <s:Body>
    <p:1619_Key xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xmlns:p="http://www.ieee1619.org/wscim-schema/1619_Key"
      xmlns:cim="http://schemas.dmtf.org/wbem/wsman/1/base">
      <p:SO_GUID>THE-KEY-ID</p:SO_GUID>
      <p:STATE>1</p:STATE>
      <p:T_EXPIRED>UTC-TIME</p:T_EXPIRED>
      <p:T_DISABLED>UTC-TIME</p:T_DISABLED>
      <p:T_CACHED>UTC-TIME</p:T_CACHED>
      <p:CIPHER_TYPE>XTS-AES-128</p:CIPHER_TYPE>
      <p:KEY>
        <p:Version>1</p:Version>
        <p:Length>32</p:Length>
        <p>Data>XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX</p>Data>
      </p:KEY>
    </p:1619_Key>
  </s:Body>
</s:Envelope>
```

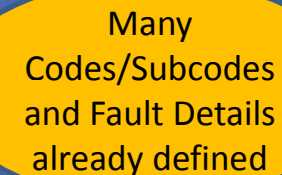
WS-Man  
Operation

IEEE 1619  
Key Object  
Schema XML

Requested  
Key

# Invalid Selector Fault Example

```
<s:Envelope xml:lang="en-US" xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:wxf="http://schemas.xmlsoap.org/ws/2004/09/transfer"
  xmlns:e="http://schemas.xmlsoap.org/ws/2004/08/eventing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>http://schemas.dmtf.org/wbem/wsman/1/wsman/fault</a:Action>
    <a:MessageID>uuid:200326B5-C451-494D-B010-032AF53FD862</a:MessageID>
    <a:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</a:To>
    <a:RelatesTo>uuid:18B4377F-1AAA-4A71-AAEF-7BD8FDF05A81</a:RelatesTo>
  </s:Header>
  <s:Body>
    <s:Fault>
      <s:Code>
        <s:Value>s:Sender</s:Value>
        <s:Subcode>
          <s:Value>w:InvalidSelectors</s:Value>
        </s:Subcode>
      </s:Code>
      <s:Reason>
        <s:Text xml:lang="en-US">The 1619.3 service cannot process the
          request because the selectors for the resource are not valid. </s:Text>
      </s:Reason>
    </s:Fault>
  </s:Body>
</s:Envelope>
```



Many  
Codes/Subcodes  
and Fault Details  
already defined

# GenerateKey Method Invocation Example

```
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope" xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://keyserver:80</a:To>
    <w:ResourceURI s:mustUnderstand="true">http://www.ieee1619.org/wscim-schema/1619_Service</w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">http://www.ieee1619tf.org/wscim-schema/1619_Service/GenerateKey</a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>uuid:CE118DCA-C500-49B8-98A7-97DB668BE15E</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false"/>
    <w:SelectorSet>
      <w:Selector Name="ServiceName">1619 Key Management Service</w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <p:GenerateKey_INPUT xmlns:p="http://www.ieee1619.org/wscim-schema/1619_Service"/>
      <p:ClientID>KEY-CLIENT-100</p:ClientID>
      <p:DataSet xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:p="http://www.ieee1619.org/wscim-schema/1619_DataSet"
        xmlns:cim="http://schemas.dmtf.org/wbem/wsman/1/base" xml:lang="en-US" >
        <p:Name>DATA-SET-1</p:Name>
        <p:Value>VALUE-1</p:Value>
        <p:ValueLength>7</p:ValueLength>
      </p:DataSet>
      ....
    </s:Body>
</s:Envelope>
```

GenerateKey  
Method XML

1619\_Service  
Class Instance ID

WS-CIM WSDL  
mapping of  
method input  
parameters

1619\_DataSet  
Object Instance

Note: Current 1619.3 Object description describes list of DataSets (what is shown here). A method parameter definition would likely be an array of DataSet instances which is not depicted.

# GenerateKey Method Response Example

```
<s:Envelope xml:lang="en-US" xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action >http://www.ieee1619.org/wscim-schema/1619_Service/GenerateKeyResponse</a:Action>
    <a:MessageID >uuid:4E940860-4362-4604-98D4-1C009C2D5E0A</a:MessageID>
    <a:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</a:To>
    <a:RelatesTo >uuid:CE118DCA-C500-49B8-98A7-97DB668BE15E</a:RelatesTo>
  </s:Header>
  <s:Body>
    <p:GenerateKey_OUTPUT xmlns:p="http://www.ieee1619.org/wscim-schema/1619_Service"
      xmlns:cim="http://schemas.dmtf.org/wbem/wsman/1/base">
      <p:1619_Key xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:p="http://www.ieee1619.org/wscim-schema/1619_Key"
        xmlns:cim="http://schemas.dmtf.org/wbem/wsman/1/base">
        <p:SO_GUID>THE-KEY-ID</p:SO_GUID>
        <p:STATE>1</p:STATE>
        <p:T_EXPIRED>UTC-TIME</p:T_EXPIRED>
        <p:T_DISABLED>UTC-TIME</p:T_DISABLED>
        <p:T_CACHED>UTC-TIME</p:T_CACHED>
        <p:CIPHER_TYPE>XTS-AES-128</p:CIPHER_TYPE>
        <p:KEY>
          <p:Version>1</p:Version>
          <p:Length>32</p:Length>
          <p>Data>XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX</p>Data>
        </p:KEY>
      </p:1619_Key>
      <p:ReturnValue>0</p:ReturnValue>
    </p:GenerateKey_OUTPUT>
  </s:Body>
</s:Envelope>
```



Key Instance  
Generated