Test Script for IEC 61968-6 Messages

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Technical Report, August, 2015

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Abstract

Placeholder

Keywords

Work Management System

Enterprise Integration

Placeholder

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# Introduction and background

The IEC has recently published a new Final Draft International Standard that supports maintenance and service work for utilities,. The formal designation for this document is:

**IEC 61968-6:FDIS Application integration at electric utilities – System interfaces for distribution management – Part 6: Interfaces for maintenance and construction**

This FDIS details three Common Information Model (CIM) profiles. One of the purposes of profiles is their use in systems integration. Coupled with IEC 61968-100, Application Integration Guidance for 61968, these specifications provide the details for application integration specific to the maintenance use cases. The formal designation for the Part 100 standard is:

**IEC 61968-100:2013 Application integration at electric utilities - System interfaces for distribution management - Part 100: Implementation profiles**

The IEC 61968-6 FDIS contains three XSDs (also referred to as profiles) that inform the interactions of Work Management related systems:

* Work Request
* Maintenance Order
* Service Order

However, the IEC profiles tend to have many optional classes and attributes and for the novice it may not be clear how to construct messages in a way that will ensure interoperability. The issue is further complicated by the fact that Part 100 supports implementation of the messaging using multiple protocols, including:

* Java Message Service (JMS)
* Generic Web Services
* Strongly-typed Web Services

Please refer to Section 5 of this Report for explanatory material concerning the usage, similarities, and differences of these three messaging protocols.

To help close the gaps in understanding, this test script describes in significant detail how the Part 6 and Part 100 profiles are to be used to support the creation, modification, and deletion of Work Requests, Maintenance Orders, and Service orders over the lifecycle of the work. UML sequence diagrams and extensive sample XML are provided in further support of this goal.

The test script will assume that the EPRI Test Harness will be used as a component in the testing. The EPRI Test Harness uses soapUI to emulate systems that will use these messages. In this fashion a vendor can send a request message to the EPRI Test Harness and, if it is well-formed, receive the appropriate response. Or, the EPRI Test Harness can send an unsolicited notification message to the vendor application. These examples, in which the EPRI Test Harness is functioning in a Server role, are illustrated in Figure 1-1.

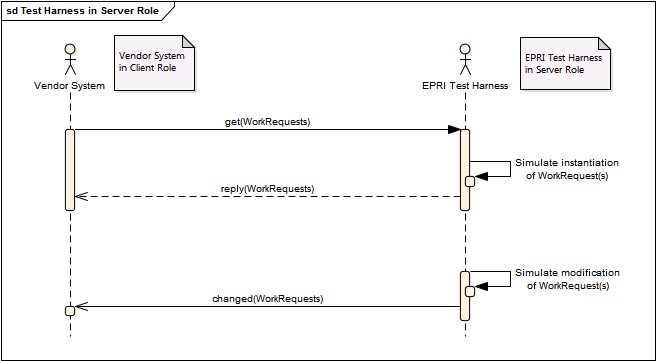


Figure ‑ Example message exchanges with the EPRI Test Harness acting in a Server Role

Conversely, the EPRI Test Harness can also be used to initiate requests and the vendor can test whether their software can appropriately consume or act on the message that it receives. Some examples are shown in Figures 1-1 and 1-2 below.

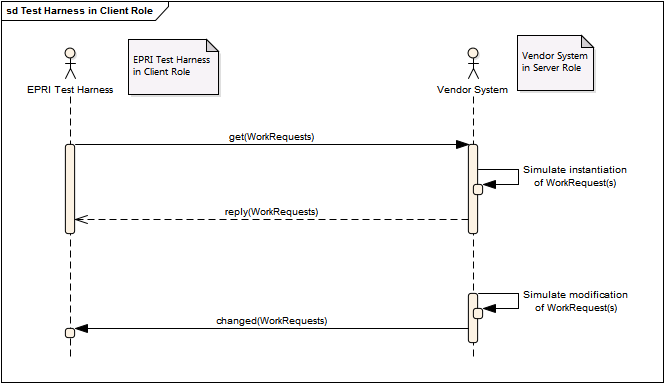


Figure ‑ Example message exchanges with the EPRI Test Harness acting in a Client Role

In the preceding diagrams, "get" and "changed" are examples of CIM *verbs* supported by IEC 61968-100. Present tense verbs (e.g., "get" and "change") are used to to initiate a request in a request/reply interaction pattern. In such a pattern, the verb for the response is always "reply". Past tense verbs (e.g., "changed" and "created") are used when one system sends an unsolicited message to another system. In this case there is no response at the CIM messaging level (although there is generally a transport-level acknowledgment in Web Service implementations).

In the above diagrams, a WorkRequest is referred to as the *noun* in Part 100 and it is the CIM object that is being instantiated or changed.

This Test Script document will address the usage of the following subset of verbs and nouns in various verb-noun combinations:

| **CIM Verbs** |
| --- |
| create |
| change |
| delete |
| get |
| execute |
| reply |
| created |
| changed |
| deleted |
| executed |

| **Part 6 CIM Nouns** |
| --- |
| WorkRequests |
| MaintenanceOrders |
| ServiceOrders |
|  |

The scope of this Test Script document is to support the testing and illustrate the use of the WorkRequest, MaintenanceOrder, and ServiceOrder profiles published in the IEC 61968-6 FDIS. However, since the time of publication of the FDIS, some deficiencies in the FDIS versions of the profiles have been identifed. These deficiencies are described in Section 3.

In addition, the Part 6 FDIS does not contain a set of profiles that can be used in conjunction with the "get" verb to identify the "query parameters" for the get transaction.

And finally, EPRI has noted that the FDIS-provided profiles have a bias for work performed in the field rather than in a building. EPRI believes it desirable to add elements within the profiles to identify locations within a building, for example a building ID, a floor, and room number.

Consequently, the profiles that will be used for the EPRI-sponsored testing defined in this Test Script document will utilize:

* modified versions of the WorkRequests, MaintenanceOrders and ServiceOrders profiles that remedy the identified deficiencies in the FDIS profiles and provide for the specification of an internal location.
* EPRI-created "GetWorkRequests", "GetMaintenanceOrders" and "GetServiceOrders" profiles to be used to specify the "query parameters" when the "get" verb is used. These profiles follow the same conventions used in other IEC 61968-series standards (for example IEC 61968 Part 9 for Meter Reading and Control).

The EPRI-generated, revised and new Part 6 profiles have been discussed in detail with the IEC 61968 Part 6 team and the IEC CIM Model Manager for the IEC 61968 package within the CIM. All parties have acknowledged the aforementioned limitations in the FDIS profile set. It is EPRI's intent to share the EPRI-generated revised and new Part 6 profiles with the IEC, with the expectation that a future edition of IEC 61968 Part 6 will contain profiles much closer to the EPRI-generated set than to those in the FDIS. It is for this reason that the decision was made to base the testing to be performed with this Test Script document using the EPRI-generated profiles in place of and in addition to the profiles in the FDIS.

## Supplemental Resources File

A supplemental Resources zip file is available from EPRI to support this Test Script document. This zip file contains XSDs, XSD Templates, WSDLs, WSDL Templates and other supporting files. A full description of the contents of this zip file can be found in Annex B of this document.

In addition, there are various references within this document to specific locations with in the zip file.

Third Party Intellectual Property

The Common Information Model is a set of International Electrotechnical Committee (IEC) standards (standards are the IP of IEC, the model is Open Source) represented in Unified Modeling Language. As a member of the IEC, EPRI has access to all CIM artifacts for software development.

# Background Information

## Definitions and Acronyms

| Term | Definition or Explanation |
| --- | --- |
| Advanced Metering Infrastructure (AMI) | Communications hardware and software and associated system and data management software that creates a network between advanced meters and utility business systems which allows collection and distribution of information to customers and other parties such as competitive retail suppliers, in addition to the utility itself |
| AMI System | A Metering System (as defined elsewhere in this table) that involves the use of Advanced Metering Infrastructure |
| Back Office System | For purposes of this Guideline document, a Back Office System is an Enterprise System other than a Head End System. *(See also Enterprise System.)* |
| CIM | Common Information Model; Standard developed by the electric power industry that has been officially adopted by the International Electrotechnical Commission (IEC) and that aims to allow application software to exchange information about the configuration and status of an electrical network. The CIM and associated standards also provide limited support for gas and water commodities and networks. |
| CIM-compliant | A term signifying compliance with the IEC Common Information Model. For purposes of this Test Script, CIM-compliant also signifies compliance with the IEC 61968-6 and 61968-100 Standards. |
| CIS | Customer Information System |
| Customer | Person or organisation receiving services from a Service Supplier. |
| Customer Account | Assignment of a group of products and services purchased by the Customer through a Customer Agreement, used as a mechanism for customer billing and payment. It contains common information from the various types of Customer Agreements to create billings (invoices) for a Customer and to receive payment. |
| Customer Agreement | Agreement between a Customer and a Service Supplier to pay for service at a specific Service Location. It records certain billing information about the type of service provided at the Service Location and is used during charge creation to characterize the type of service. |
| Enterprise System | A system in the utility enterprise dedicated to the support of one or more business functions. Examples include, but are not limited to, work management systems, asset management systems, mobile work dispatching systems, metering Systems and outage management systems. |
| IEC | International Electrotechnical Commission |
| JMS | Java Message Service is a messaging standard that allows application components based on the Java 2 Platform, Enterprise Edition to create, send, receive, and read messages. |
| Meter | Physical asset that performs the metering role of the Usage Point. Used for measuring consumption and detection of events. |
| Meter Exchange | A business operation that involves the removal of one Meter and the installation of another meter at a Usage Point. |
| OperationSet | A special construct used with the payload of a CIM-Compliant message to request execution of multiple CIM-based transactions in a single request or to handle special transactions that call for deletion of attributes or instances of associated classes. Can also used to report the results of OperationSet requests. |
| Service Category | Category of service provided to the Customer (e.g., electricity, gas, water, etc.) |
| Service Supplier | Organisation that provides services to Customers (e.g., a distribution utility or a retailer). |
| SOAP | Simple Object Access Protocol |
| Usage Point | Logical or physical point in the network to which readings or events may be attributed. Used at the place where a physical or virtual meter may be located; however, it is not required that a meter be present. (See also Service Delivery Point.) |
| Usage Point Location | The location of an individual Usage Point. |
| UUID | A globally unique identifier. A UUID is a unique reference number used as an identifier in computer software.  The value of a GUID is represented as a 32-character hexadecimal string, such as {21EC2020-3AEA-1069-A2DD-08002B30309D}, and is usually stored as a 128-bit integer. The total number of unique keys is 2128 or 3.4×1038. This number is so large that the probability of the same number being generated randomly twice is negligible. Nevertheless, certain techniques have been developed to help ensure that GUID numbers are not duplicated. |
| XML | eXtensible Markup Language, a method of organizing data so that individual data items are delimited by descriptive tags. (see http://www.w3.org/XML/) |
| XSD | XML Schema Definition |

## Assumptions and Conventions

| ID | Assumption / Convention Description |
| --- | --- |
| 1 | It is assumed that primary users of this Test Script document are sufficiently skilled in the use of XML, XSDs, WSDLs and associated integration technologies. |
| 2 | In the CIM-Compliant XML Schema Definitions (XSDs), certain fields are required and others are optional. Fields designated as optional in the XSDs may or may not appear in the examples in this document. Some such fields may be optional in the XSD yet required in specific test case scenarios. For purposes of the test cases described in this document, any fields appearing in the XSDs but not mentioned in the examples in this document can be ignored; however to pass the tests requires that the messages sent by the Application Being Tested can pass validation against the applicable IEC 61968-100 and (EPRI-modified ) IEC 61968-6 XSDs (profiles). |
| 3 | Within XML messages, CIM verbs must be in lower case. |
| 4 | The sequence (order) of elements in CIM-compliant XML messages must match the sequence of elements in the XSDs. Everyt attempt has been made to ensure the sequence of elements appearing in sample XML within this document is consistent with the applicable XSDs; however, in case of conflict between the sequence in the XSDs and the sequence in the test case steps in this Test Script document, the sequence in the XSDs shall take precedence. |
| 5 | Timestamps (to convey dates and/or times) in XML messages shall be formatted consistent with International Standard ISO-8601 (2004). Two formats are supported:   1. Times are expressed in UTC (Coordinated Universal Time), with a special UTC designator ("Z"). 2. Times are expressed in local time, together with a time zone offset in hours and minutes. A time zone offset of "+hh:mm" indicates that the date/time uses a local time zone which is "hh" hours and "mm" minutes ahead of UTC. A time zone offset of "-hh:mm" indicates that the date/time uses a local time zone which is "hh" hours and "mm" minutes behind UTC.   For example, the following are valid representations of 8:15:30 am, US Central Standard Time on November 15, 1994:  1994-11-15T14:15:30Z  1994-11-15T08:15:30-06:00  A time stamp of 00:00:00 refers to midnight at the beginning of the specified day. For example, 1994-11-15T00:00:00-06:00 refers to midnight US Central Standard Time at the first moment of November 15, 1994. The following midnight (24 hours later) may be referred to in any of the following ways:  1994-11-16T06:00:00Z  1994-11-16T00:00:00-06:00  1994-11-15T24:00:00-06:00  Situations can arise where it is desirable to express a time independent of a date. In such cases, follow the above examples, but delete the date portion of the string and the “T” separator. |
| 6 | When deleting an attribute from a CIM object using an Operation (within an OperationSet) where the elementOperation Boolean is "true" and the Operation verb is "delete", it is necessary to supply a value for the attribute that will pass XML schema validation. In these instances, the actual value supplied is ignored and thus may be any value that is of the proper data type to pass validation. |
| 7 | When required to fully qualify a reply to an OperationSet request, the operationID element for the relevant Operation in the request message is supplied in the reply message(s). This is used, in conjunction with the overall CorrelationID in the message Header, to correlate replies with their corresponding requests. If an operationID is not supplied in a reply, the reply is interpreted as applying to the entire OperationSet. |
| 8 | In the XSD diagrams generated by XMLSpy®, solid lines indicate mandatory elements and dashed lines indicate optional elements. |
| 9 | Placeholder: Add assumption regarding presence or absense of payloads in reply messages. |

## 61968 Part 100 Considerations

Placeholder: Discuss Message.xsd and point to Annex C. Also Point to Annex D for information on the use of OperationSets.

Placeholder: Discuss the 3 transport protocols and how they are supported by both profiles taken from the standards as well as profiles and WSDLs derived from those in the standards using the procedures documented in Part 100.

Placeholder: Discuss Message Patterns and and Sequence Diagrams for Test Cases

## Message Patterns and Sequence Diagram Conventions

Placeholder: Following text from EPRI DER document needs to be altered for this document.

Include

For the purposes of this test plan there is no “system of record” for the DERMS or other systems that might communicate with the DERMS, hence why generic actors such as “requesting entity” and “providing entity” will be shown in the various sequence diagrams. The idea is that a DERMS might be a standalone product, or perhaps subsumed into an existing DMS; the idea is that the specification is not prescriptive as to where the DERMS functionality resides, only to test the communications that will need to occur.

One caveat for the purposes of MultiSpeak: Specific examples have been used as potential guidance that will be reflected in the new version 5.0.x specification.

## Object Identifiers in Messages

Figure xx shows the CIM models used for names. In Figure 9.2, the model is seen from the perspective of an example XML structure that would be realized within a message profile.

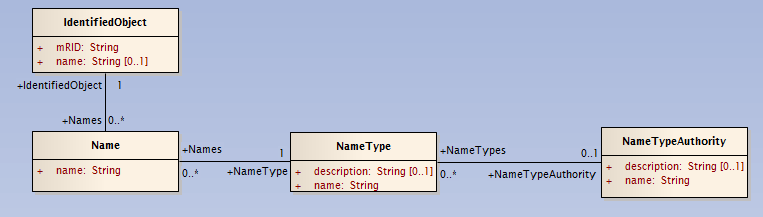


Figure ‑ CIM Naming

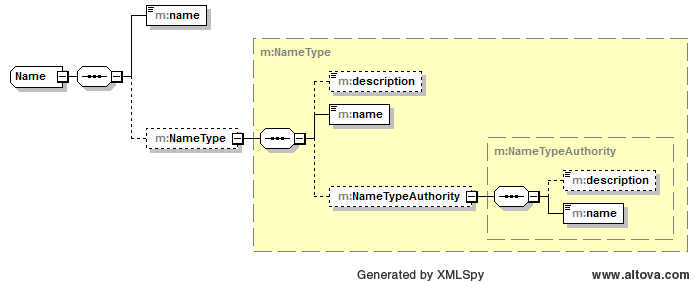


Figure ‑ Example XML Structure for Names

Using the above example as a reference, there are a number of important rules that must be followed:

* An object may be identified using a globally unique mRID
* An object may be identified using one or more Names.name values
* An object may have both mRID and Names.name identifiers
* If more than one Names.name value is supplied, each name should have a corresponding Names.NameType.name
* A Names.NameType.NameTypeAuthority.name must be specified if two objects have identical Names.name and Names.NameType.name values and there is a need for them to be identified uniquely.
* While the IdenitifiedObject.name value is defined in the CIM, it is not used within IEC 61968 profiles in order to avoid ambiguities where a producer could choose to use IdentifiedObject.name, but a consumer could expect IdentifiedObject.Names.name. Therefore, from the perspective of IEC 61968, IdentifiedObject.name is deprecated.
* Producers and consumers must agree upon the use of mRID or Names.name values to be used for object identification. This can vary for a given implementation, although the use of Names.name values is strongly recommended.
* In the implementation cases where multiple consumers may exist, a producer may need to supply multiple Names.name values, each with a different Names.NameType.name in order to support the specific needs of each consumer.

## Uniqueness Requirements for Object Identifiers

When mRIDs are used, the mRID for a given instance of a CIM class must, by definition, be globally unique.

The uniqueness constraints on Names class identifiers are usage-dependent. Names.name instances may be:

* globally unique across all IEC messages
* globally unique across all IEC messages when combined with a Names.NameType.name and/or a Names.NameTypeAuthority.name
* unique within the context of a single IEC message
* unique within the context of a single IEC message when combined with a Names.NameType.name and/or a Names.NameTypeAuthority.name
* non-unique

Although instances of the Names class may be non-unique, every CIM object that is referenced by Names class in an IEC message must be referenced unambiguously.

## Use of "ref=" Syntax within IEC Messages

Within IEC messages, it is possible to refer to an object “by reference” as well as the common (nested) “by value”. These references may be done using mRID or Names.name values. A common example of this for IEC 61968-6 can be seen for the reference of ReadingTypes and ReadingQualityTypes in the ServiceOrders profile.

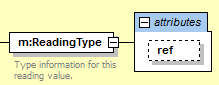


Figure ‑ Use of ref= Syntax

Within an XML message the “ref” attribute would then identify a specific ReadingType using a Names.name value for the ReadingType.This scheme has many benefits, such as reducing the size of the XML message and allowing for aliasing of objects, where an object can be known by more than one name.

When the “ref=” notation refers to an enumerated value defined in the an IEC 61968-series Standard, it is not necessary for the reference to be fully resolved (expanded) at the root level in the XML of a given message (although it is perfectly acceptable to do so). When the enumeration is not defined in an IEC 61968 Standard, the reference should be resolved in the XML by including an element at the root level of the payload having an mRID or a Names.name matching the string specified in the “ref=” notation. The Sample XML for Test Case Client-SO-1a in this Test Scripts document illustrates the use of the "ref=" syntax.

## Message Correlation

The Message HeaderType contains elements that provide domain-level context to the payload contained in the Message PayloadType.

To enable the ability for a requesting system to correlate particular responses with the originating request, the message-level element Message.Header.CorrelationID is used.

The following XML illustrates the Message.Header.CorrelationID:

<RequestMessage>

<Header>

<Verb>get</verb>

<Noun>WorkRequests</noun>

<CorrelationID>cc52b3a0-a3b9-420e-a976-40b9cfaa433a</CorrelationID>

<!--...other header elements -->

</Header>

<Payload>

<!--..some payload -->

</ Payload >

</RequestMessage>

The value provided in this CorrelationID element in the RequestMessage must be echoed back to the requesting system in the ResponseMessage’s Header element of the same name, to allow for full request-response correlation in the original requesting system.

## Best Practices for Assignment of Message IDs and Correlation IDs

Depending upon the specifics of any given use case involving CIM-Compliant transactions, a system may function as a either a client or a server (or both). Such a system may initiate requests, respond to requests, publish information or receive published information. Some systems may also receive messages from one system and relay them to another system.

All CIM-Compliant messages will have a MessageID in the IEC Message Header. Messages following a Request/Response pattern will have also have a CorrelationID in the IEC Message Header.

The Best Practices for the generation and use of MessageIDs and CorrelationIDs are as follows:

* Every message, whether sent received, should have a Message ID that is a non-intelligent, machine-generated string guaranteed to be unique. Use of UUIDs as defined in RFC 4122 is recommended. Message IDs are generated by the system originating the message.
* Request messages will also include a Correlation ID. For a request message, the MessageID of the request may also be used as the CorrelationID; however it is entirely acceptable to generate a different unique string. Either way, CorrelationIDs should also be non-intelligent, machine-generated strings that are generated by the system originating the request message.
* Response (verb=reply) messages will also include a CorrelationID. The CorrelationID in the response (reply) message must be the same as the CorrelationID from the original (corresponding) request message. *Note: Although there are no such cases documented in this Test Script document, CIM messaging may involve multiple response messages to a given request message; in this case the CorrelationID in each such response message will be identical.*
* In cases where a System C is acting as an intermediary in receiving requests from System A, forwarding requests to System B, receiving responses from System B and forwarding the responses to System A, the MessageIDs and CorrelationIDs used in the communications between System C and System A should be different from and entirely independent of the MessageIDs and CorrelationIDs used in the communications between the System C and System B.

Strict compliance with these Best Practices is highly recommended but not required.

# IDENTIFIED ISSUES WITH IEC 61968-6 FDIS PROFILES

Placeholder: Add discussion describing the variety of problems. Include some XMLSpy diagrams as called for, particularly to illustrate the introduction of the WorkRequests, maintenanceOrders and ServiceOrders:

Problems include:

* missing root elements of WorkRequests, MaintenanceOrders, and ServiceOrders
* incorrect structure to support "Organization"
* problems with use of ref= notation for Organization, ReadingTypes and ReadingQualities
* Use of ServiceLocation vs. UsagePointLocation in ServiceOrders profile
* lack of parallel structure in the 3 XSDs where it made sense to have parallel structure. Specific example is WorkLocation.
* no support for "get" transactions

# EPRI-generated IEC 61968-6 Profiles and WSDLs

Placeholder: Add discussion of:

* Reason for generating these profiles and WSDLs
  + to remedy identified deficiencies
  + to support "get" use cases
  + to support internal location
  + to provide Constrained profiles for create use cases
  + to provide Unconstrained profiles for change and delete use cases
  + to support testing using strongly-typed Web Services
* Discuss some problems with the Message and WSDL templates in part 100
* Itemize the profiles that were created and their intended use
* Identify where each of the EPRI-generated profiles and templates can be found

Artifact Generation Flowchart.emf

Figure ‑ Artifact Generation Flowchart

Please refer to the Supplemental Resources zip file described in Section 1 and Annex B for copies of these various artifacts.

# use of jms, generic web services, and Strongly-typed Web Services

Placeholder: Add discussion of:

* the 3 protocols supported by Part 100
* the fact that this section describes some of the considerations and differences in using them
* the commonality of Message.xsd in JMS and Generic Web Services compared with the service-specific XSDs used to support the strongly-typed web services
* fact that the test cases in this document utilize strongly-typed web services exclusively and use of JMS and Generic Web Services is not in scope at this time.
* Remainder of this section is included for completeness to provide the reader with supplemental understanding that could inform the use of JMS and/or Generic Web Services in the future.
* The remainder of this section utilizes Test Case WR-1a (see Section xx) to illustrate some key differences in using the different Part 100 transport protocols.

## JMS or Generic Web Services Variant

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via JMS or Generic Web Services as defined in IEC 61968 Part 100.

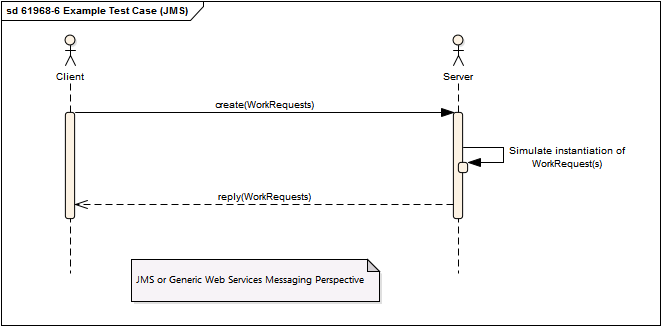


Figure ‑ Example message exchange using JMS

Sample XML for the JMS or Generic Web Services variant of the "create/WorkRequests" test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

Step 1 *(Message Stereotype = Request Message)*

<?xml version="1.0" encoding="UTF-8"?>

<RequestMessage xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2011/schema/message Message.xsd">

<Header>

<Verb>create</Verb>

<Noun>WorkRequests</Noun>

<Timestamp>2001-12-17T09:30:47Z</Timestamp>

<MessageID>407903a3-4725-465f-a56b-45cf1cde5ede</MessageID>

<CorrelationID>291ab243-49ba-463b-9fca-d61901bf7319</CorrelationID>

</Header>

<Payload>

<WorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequests# WorkRequests.xsd">

<WorkRequest>

<mRID>375776be-d731-433c-a41a-3eefbc289344</mRID>

<Names>

<name>WR-14657</name>

<NameType>

<name>Work Request Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>cbf227f9-dfa1-487d-b787-7f4c818ea737</mRID>

<Names>

<name>DSOP</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>57</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 82</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Harrison</name>

<number>3372</number>

<suffix>NE</suffix>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>0249dbbe-9f3b-481c-982a-1fa7ea90b45a</mRID>

<kind>repair</kind>

<lastModifiedDateTime>2015-06-16T11:55:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-06-16T11:55:24-06:00</requestDateTime>

<statusKind>waitingToBeScheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-06-16T11:55:24-06:00</createdDateTime>

<reason>Damage Reported</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<justification>Safety Hazard</justification>

<rank>1</rank>

<type>Emergency</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-06-16T17:00:00-06:00</end>

<start>2015-06-16T11:55:24-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fb92ddab-09e0-4973-a890-89b1f6700f1d</mRID>

<direction>NW</direction>

<Hazards>

<type>Exposed Conductor</type>

</Hazards>

<InternalLocation>

<BuildingName>Warehouse</BuildingName>

<BuildingNumber>2</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>101-E</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2nd building along driveway</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Rogers</name>

<number>122</number>

<prefix>N</prefix>

<suffix>SW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>07c461d4-fca9-4097-a3e1-70f478e87832</mRID>

<instruction>Repair damaged meter panel</instruction>

<subject>Damaged meter panel</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>17fa20de-8949-40d5-9bce-93b9e5a74ce5</mRID>

<critical>true</critical>

<utcNumber>8752-90765-830632</utcNumber>

</Assets>

<Crews>

<mRID>b0b5e22d-a438-4021-9a85-d745b9bcd18b</mRID>

<Names>

<name>Jacobs, Brian</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

</WorkRequests>

</Payload>

</RequestMessage>

Step 2 *(Message Stereotype = Response Message)*

<?xml version="1.0" encoding="UTF-8"?>

<ResponseMessage xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2011/schema/message Message.xsd">

<Header>

<Verb>reply</Verb>

<Noun>WorkRequests</Noun>

<Timestamp>2015-06-25T20:21:03-06:00</Timestamp>

<MessageID>71b323ba-2619-4e02-89ae-8a40528baa8c</MessageID>

<CorrelationID>291ab243-49ba-463b-9fca-d61901bf7319</CorrelationID>

</Header>

<Reply>

<Result>OK</Result>

<Error>

<code>0.0</code>

</Error>

</Reply>

</ResponseMessage>

## Strongly-typed Web Services Variant

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

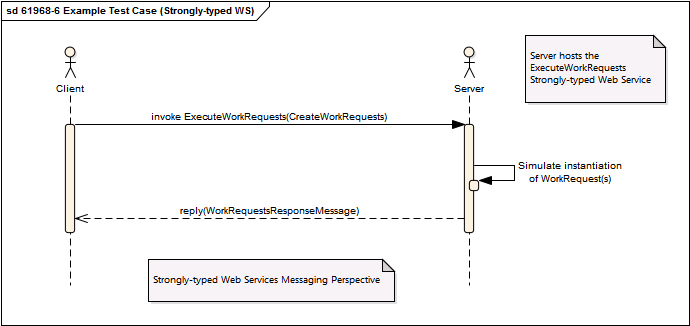


Figure ‑ Example message exchange using Strongly-typed Web Services

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. As is the case with the previously-documented JMS and Generic Web Services variant, Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 (Message Stereotype = Request Message)*

<?xml version="1.0" encoding="UTF-8"?>

<tns:CreateWorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-06-25T20:21:01-06:00</msg:Timestamp>

<msg:MessageID>3e53841d-fe8d-4bbb-80c8-ace4de871c59</msg:MessageID>

<msg:CorrelationID>21cd4ac5c-c81d-4cec-85a0-3d1685c7a47c</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<mRID>375776be-d731-433c-a41a-3eefbc289344</mRID>

<Names>

<name>WR-14657</name>

<NameType>

<name>Work Request Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>cbf227f9-dfa1-487d-b787-7f4c818ea737</mRID>

<Names>

<name>DSOP</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>57</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 82</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Harrison</name>

<number>3372</number>

<suffix>NE</suffix>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>0249dbbe-9f3b-481c-982a-1fa7ea90b45a</mRID>

<kind>repair</kind>

<lastModifiedDateTime>2015-06-16T11:55:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-06-16T11:55:24-06:00</requestDateTime>

<statusKind>waitingToBeScheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-06-16T11:55:24-06:00</createdDateTime>

<reason>Damage Reported</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<justification>Safety Hazard</justification>

<rank>1</rank>

<type>Emergency</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-06-16T17:00:00-06:00</end>

<start>2015-06-16T11:55:24-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fb92ddab-09e0-4973-a890-89b1f6700f1d</mRID>

<direction>NW</direction>

<Hazards>

<type>Exposed Conductor</type>

</Hazards>

<InternalLocation>

<BuildingName>Warehouse</BuildingName>

<BuildingNumber>2</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>101-E</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2nd building along driveway</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Rogers</name>

<number>122</number>

<prefix>N</prefix>

<suffix>SW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>07c461d4-fca9-4097-a3e1-70f478e87832</mRID>

<instruction>Repair damaged meter panel</instruction>

<subject>Damaged meter panel</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>17fa20de-8949-40d5-9bce-93b9e5a74ce5</mRID>

<critical>true</critical>

<utcNumber>8752-90765-830632</utcNumber>

</Assets>

<Crews>

<mRID>b0b5e22d-a438-4021-9a85-d745b9bcd18b</mRID>

<Names>

<name>Jacobs, Brian</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:CreateWorkRequests>

*Step 2 (Message Stereotype = Response Message)*

<?xml version="1.0" encoding="UTF-8"?>

<tns:WorkRequestsResponseMessage xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-06-25T20:21:01-06:00</msg:Timestamp>

<msg:MessageID>4d727223-d4ac-47e6-8728-19e85e2ad54d</msg:MessageID>

<msg:CorrelationID>1cd4ac5c-c81d-4cec-85a0-3d1685c7a47c</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:WorkRequestsResponseMessage>

## Identification and Discussion of Differences

Placeholder: -Discuss:

* namespacing
* stereotypes
* use of service-specific XSDs that combine the message wrapper with the payload
* incorporation of the message-specific XSDs into the strongly-typed WSDLs
* use of "constrained" vs. "unconstrained" profiles - "constrained" for create scenarios and 'unconstrained for change and delete scenarios.

# GENERATION OF SAMPLE XML fOR TEST CASES

Placeholder: This section to be revised and extended.

These examples were generating using XMLSpy. They were creating by selecting the XSDs provided in *Enterprise Integration Functions for Distributed Energy Resources, Phase 1.* EPRI, Palo Alto, CA: 2013. 3002001249. Under the **DTD/Schema** option from the main menu, then **Generate Sample XML file…** option was selected with the following attributes:

Placeholder: Add statement that the first test case for each of the profiles includes a richly-populated profile to help illustrate the business intent and business usefulness of the profile.

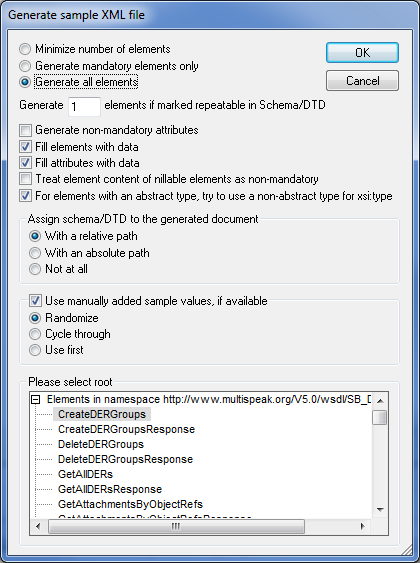


Figure 6‑1 Generating example XML using XMLSpy – v2015 options

**Use of Example XML**

The example XML typically represents an example of the minimum XML required to satisfy a message requirement. These example represent optimistic, positive, tests. That is, no expectation is made for error-handling in this version of the test plan. Additionally, while both the CIM-based and MultiSpeak XSDs support extensions, this capability is also not being tested so extensions are not included.

Finally, it should be noted that these example are for messages *payloads* only. For WSDL examples please see the associated annex.

# Test case overview

Placeholder: Discuss the nature of and the rationale for the set of test cases included in the document

* not intended to be exhaustive
* not intended to handle every combination and/or permutation
* intended to clearly illustrate fundamental concepts and usage conventions that can be applied to generate additional and more complex test cases.

In some cases where there are only minor differences, the description and steps for a test case may simply reference the similar test case and enumerate the differences.

**Work Request Test Cases**

| Test Case | Test Case Description |
| --- | --- |
| WR-1a | Create WR-14657 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew |
| WR-1b | Fail creation of (duplicate) WR-14657 |
| WR-1c | Create WR-14433 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew  Create WR-14434 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew |
| WR-1d | Create WR-15433 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew  Fail creation of WR-15434 |
| WR-2a | Change schedule for WR-14657 from Test Case WR-1a |
| WR-2b | Add a 2nd Crew to WR-14433 from Test Case WR-1c |
| WR-3 | Delete one of the 2 crews from WR-14433 from Test Case WR-1c |
| WR-4 | Delete WR-14657 from Test Case WR-1a |
| WR-5a | Get returning WR-14433 from Test Case WR-1c |
| WR-5b | Get returning WR-14434 from Test Case WR-1c and WR-15433 from Test Case WR-1d |
| WR-6 | Created WR-24255 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew and priority=3  Created WR-24256 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew |
| WR-7 | Changed priority of WR-24255 from Test Case WR-6 |
| WR-8 | Deleted extension from Org in WR-24256 from Test Case WR-6 |
| WR-9 | Deleted WR-24255 from Test Case WR-6 |

**Maintenance Order Test Cases**

| Test Case | Test Case Description |
| --- | --- |
| MO-1a | Create MO-21897 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew |
| MO-1b | Fail creation of (duplicate) MO-21897 |
| MO-1c | Create MO-86653 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew  Create MO-86654 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew |
| MO-1d | Create MO-65888 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew  Fail creation of MO-65889 |
| MO-2a | Change schedule for MO-21897 from Test Case MO-1a |
| MO-2b | Add a 2nd Crew to MO-86653 from Test Case MO-1c |
| MO-3 | Delete one of the 2 crews from MO-86653 from Test Case MO-1c |
| MO-4 | Delete MO-21897 from Test Case MO-1a |
| MO-5a | Get returning MO-86653 from Test Case MO-1c |
| MO-5b | Get returning MO-65888 and MO-65889 from Test Case MO-1d |
| MO-6 | Created MO-33344 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew and priority=3  Created MO-33345 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew |
| MO-7 | Changed priority of MO-33344 from Test Case MO-6 |
| MO-8 | Deleted extension from Org in MO-33345 from Test Case MO-6 |
| MO-9 | Deleted MO-33344 from Test Case MO-6 |

**Service Order Test Cases**

| Test Case | Test Case Description |
| --- | --- |
| SO-1a | Create SO-36784 with 1 Work Item, 1 Work Task, 1 Crew (no readings) |
| SO-1b | Fail creation of (duplicate) SO-36784 |
| SO-1c | Create SO-56214 with 1 Work Item, 1 Work Task, 1 Crew (no readings)  Create SO-56215 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew (no readings) |
| SO-1d | Create SO-86339 with 1 Org, 1 Work Item, 1 Work Task, 1 Crew (no readings)  Fail creation of SO-86340 |
| SO-2 | Change SO-36784 from Test Case SO-1a, reflecting completion and capture of meter readings |
| SO-3 | Delete the InternalLocation from the WorkLocation in SO-56214 from Test Case SO-1c |
| SO-4 | Delete SO-86339 from Test Case SO-1d |
| SO-5 | Get returning SO-36784 from Test Cases SO-1a and SO-2 and SO-56215 from Test Case SO-1c |
| SO-6 | Created SO-76677 with 1 Work Item, 1 Work Task (meter exchange), 1 Crew (no readings)  Created SO-76678 with 1 Work Item, 1 Work Task, 1 Crew (no readings) |
| SO-7 | Changed SO-76677 from Test Case SO-6 to reflect completion and meter readings |
| SO-8 | Deleted phone extension from WorkLocation in SO-76678 from Test Case SO-6 |
| SO-9 | Deleted SO-76678 from Test Case SO-6 |

# Test Environment

Placeholder:

Provide general description of:

* the Test Environment to be provided by EPRI and the expectations for how the Tst environment will be used
* how the testing will be performed using strongly-typed Web Services
* JMS and Generic Web Services are out of scope at this time

## Test Environment Requirements and Recommendations

Add material describing the actor roles of:

* Application Being Tested
* EPRI Test Harness

including the fact that either can serve as client or server.

* Use of the Sample XML that accompanies the individual Test Cases
* Test sequence relative to Preconditions
* Expectations for adherence to certain conventions and practices concerning:
  + MessageIDs and CorrelationIDs
  + Use of UUIDs
  + mRID and Names, used independently and together for a given object
  + population of time fields
  + population of additional optional fields in the messages

## Using the EPRI Test Harness

In soapUI, to change the URL for control type messages – simply bring up each test case by double clicking, then click the pulldown bar for the url

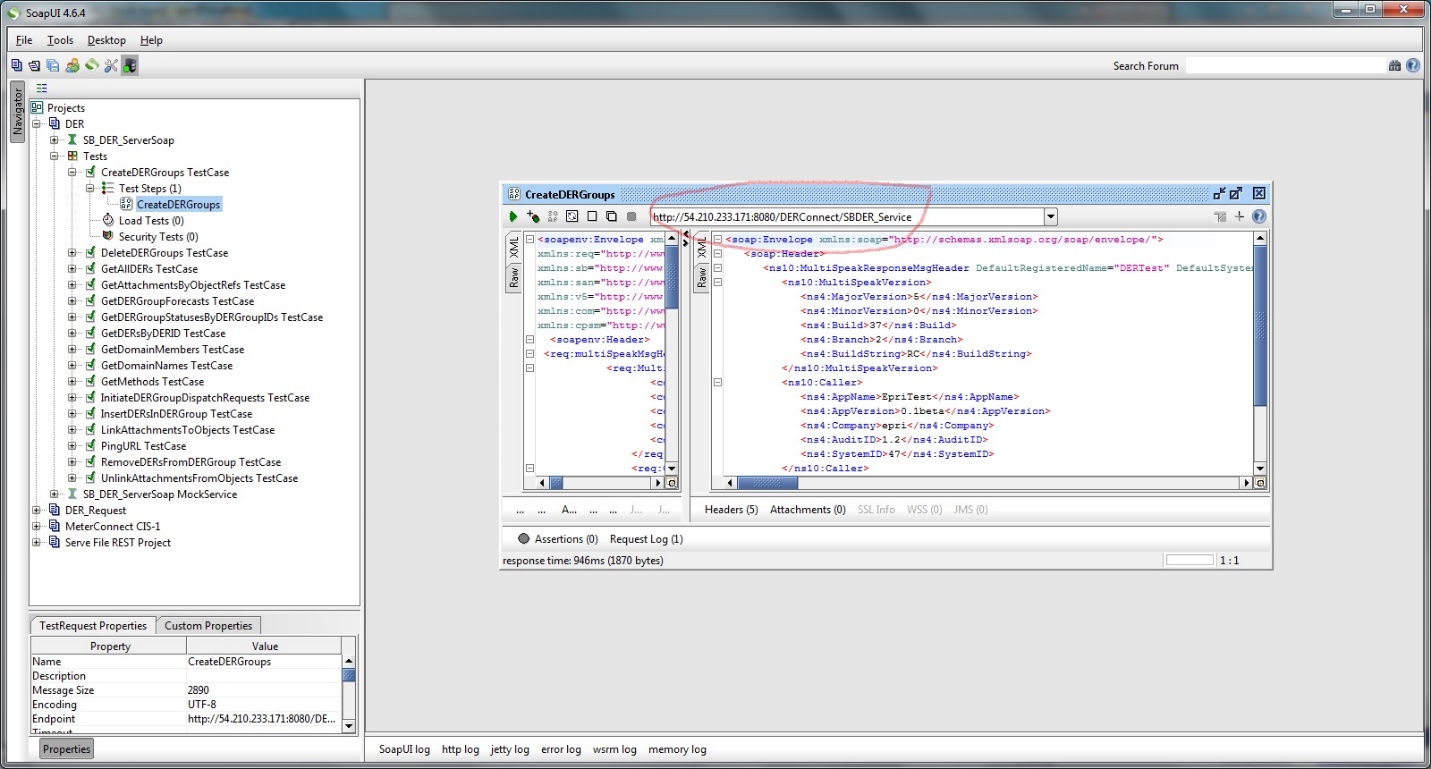


Figure ‑ - soapUI screenshot with the URL example

Then click the “*add new endpoint”*, change the IP/hostname to the EPRI EC2 instance, which is 54.210.233.171 (in these screenshots).

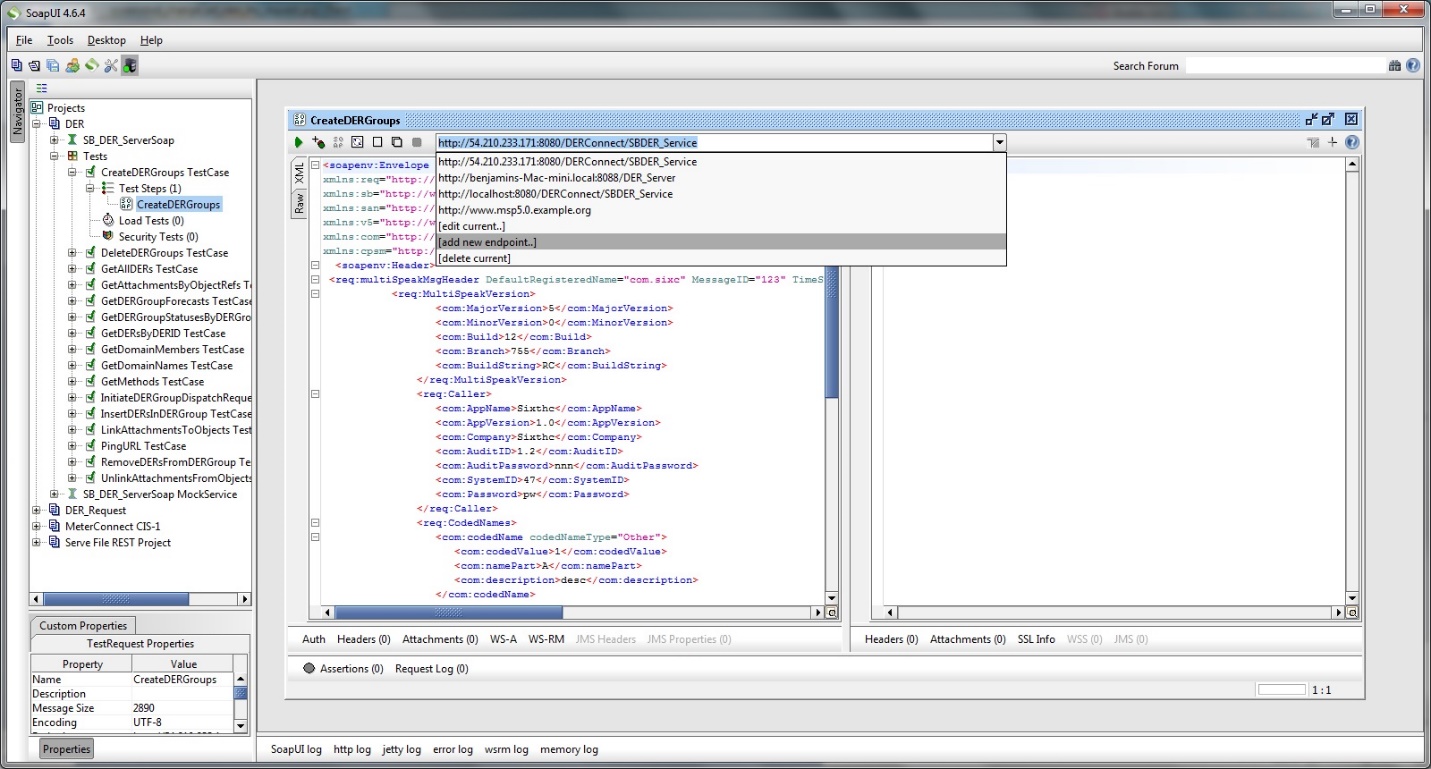


Figure ‑ - soapUI screenshot for the request type example

For request type messages, edit the URL as above, but also supply the response URL. The response URL is the endpoint that the test harness will use when sending the test message. You could point it back to the server, for a sort of loopback test, but each customer will be pointing that at their own receiving server/code.

Using soapUI variables will make the exchanges easier to manage. Clicking on the high level project (DER Request in the screenshot below), then clicking on custom properties will bring up the variable list. Editing these should change settings for all the test cases. The user can still change them in the individual messages by direct edit, however.

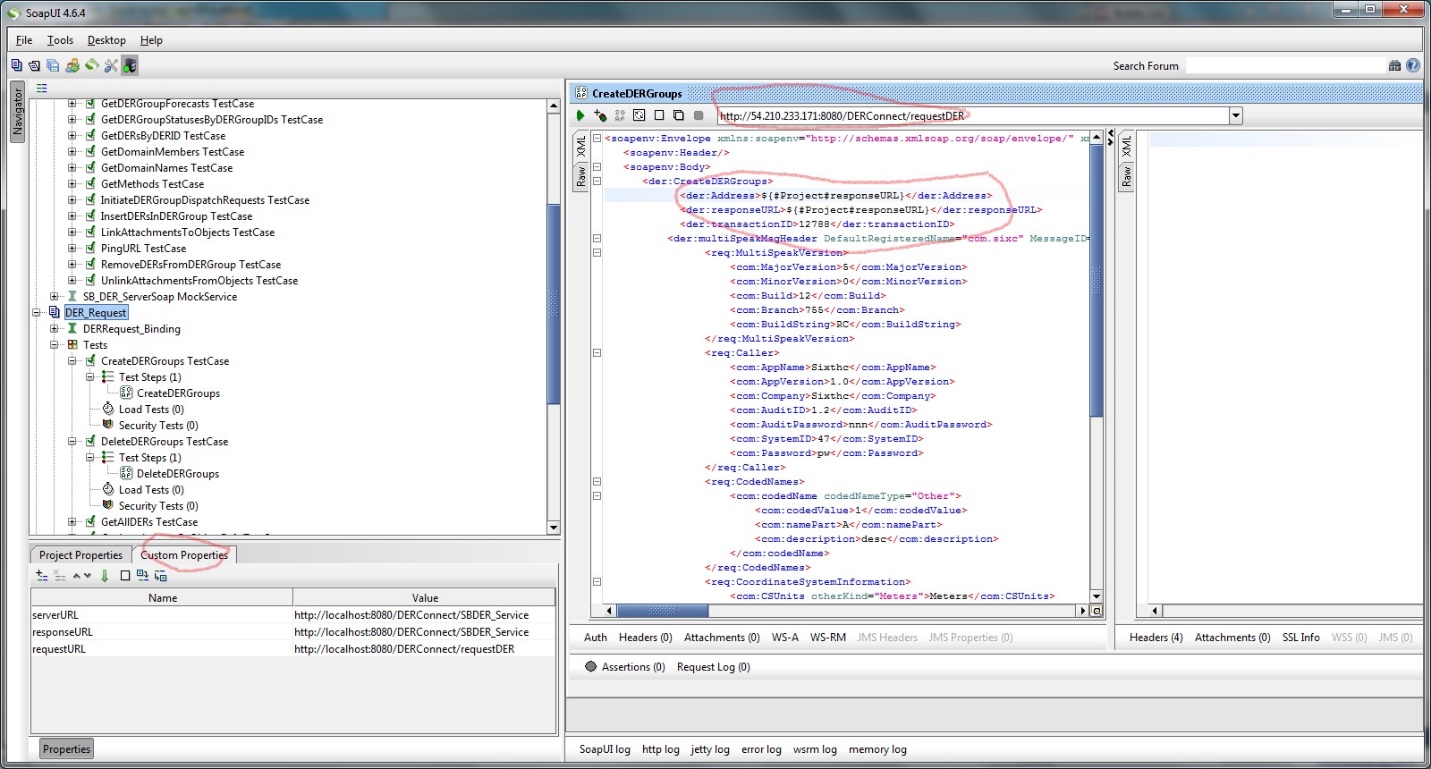


Figure ‑ - soapUI example illustrating how to change variables

# Test Acceptance Criteria

Placeholder:

Describe acceptance criteria for cases where Application Being Tested functions as a Client.

Describe acceptance criteria for cases where Application Being Tested functions as a Server.

# Work Request Test cases

## WR-1a: Client requests creation of a Work Request and Server replies (Success - Single Work Request)

In this test case, the Client requests the Server to instantiate a single Work Request. The Server returns a response message indicating success with no errors.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the Work Request would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "create" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

Also as noted, this test case illustrates the successful creation of a single Work Request. Subsequent test cases will illustrate attempts to create multiple Work Requests via a single request message as well as responses indicating various failures as well as successes.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | A new Work Request is created with the mRID and Names identifier(s) that were passed in the request message. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

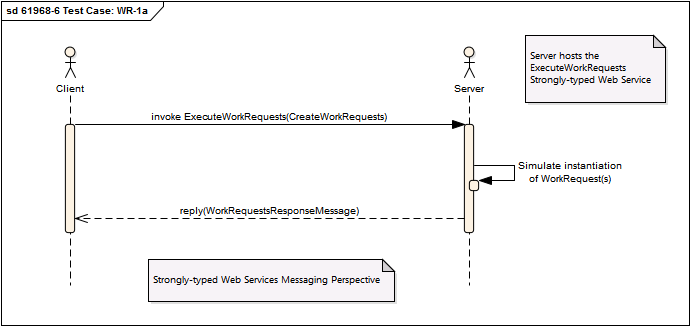


Figure ‑ Sequence Diagram for Test Case WR-1a

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateWorkRequests | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreateMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-27T14:35:04-06:00</msg:Timestamp>

<msg:MessageID>b98a0172-6658-4aed-b13b-e4ac9d33b985</msg:MessageID>

<msg:CorrelationID>8583c8d6-a9fb-4708-88ab-341186f04437</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<mRID>8687d5d9-d972-4aec-990e-ea3c01175e42</mRID>

<Names>

<name>MO-21897</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>09aff76b-20c0-4ea0-b259-1990f0172dc3</mRID>

<Names>

<name>MNT04</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>201</extension>

<localNumber>5655</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>446 Main St, Palo, IA 52324</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Main</name>

<number>446</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>2404b40d-a8d6-4eed-9f52-74b7a464eb28</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-27T14:35:03-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-27T14:35:03-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-27T14:35:03-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-29T17:00:00-06:00</end>

<start>2015-07-29T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>db63f900-b36f-40f1-9614-105ae5a48fef</mRID>

<Hazards>

<type>High Voltage</type>

</Hazards>

<mainAddress>

<streetDetail>

<addressGeneral>14455 Blairsferry Rd, Palo, IA 52324</addressGeneral>

<name>Blairsferry</name>

<number>14445</number>

<type>Rd</type>

<withinTownLimits>false</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>5e61408b-fa2a-4692-8cdc-623e6bc65d53</mRID>

<instruction>Exchange cover on equipment panel</instruction>

<statusKind>scheduled</statusKind>

<subject>Replace cover</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>ddc0e9cd-29db-4ea8-b0de-002a73028a0c</mRID>

<critical>false</critical>

<Location>

<mRID>790fd69b-c9b8-4fcd-a19b-0a357587e8ad</mRID>

<direction>S</direction>

<Hazards>

<type>High Voltage</type>

</Hazards>

<InternalLocation>

<BuildingName>Shed</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>14455 Blairsferry Rd, Palo, IA 52324</addressGeneral>

<name>Blairsferry</name>

<number>14445</number>

<type>Rd</type>

<withinTownLimits>false</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</Location>

</Assets>

<Crews>

<CrewMembers>

<Person>

<firstName>Eric</firstName>

<lastName>Norton</lastName>

</Person>

</CrewMembers>

<Names>

<name>Norton, Eric</name>

</Names>

</Crews>

<MaterialItems>

<Names>

<name>XC-4459848-CH</name>

<NameType>

<description>Panel Cover</description>

<name>Part Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<quantity>

<multiplier>none</multiplier>

<unit>count</unit>

<value>1</value>

</quantity>

</MaterialItems>

</WorkTasks>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:CreateMaintenanceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | WorkRequests.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | WorkRequestsResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:WorkRequestsResponseMessage xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-06-25T20:21:01-06:00</msg:Timestamp>

<msg:MessageID>12389616-c4a4-4fe2-857e-64652e68be8d</msg:MessageID>

<msg:CorrelationID>90b6799e-b39a-468f-b2cb-9ee42d706b4d</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:WorkRequestsResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Work Request | http://xx.xxx.xxx.xxx/ | create | WorkRequests |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | WorkRequests |  |

## WR-1b: Client requests creation of a Work Request and Server replies (Failure - Single Work Request)

In this test case, the Client requests the Server to instantiate a single Work Request; however the ID of the Work Request is the same as in Test Case WR-1a. Consquently, the Server returns a response message indicating a failure based on a business rule prohibiting duplicate Work Requests.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

Also as noted, this test case illustrates a failure of a request to create a single Work Request. Subsequent test cases will illustrate attempts to create multiple Work Requests via a single request message as well as responses indicating various failures as well as successes.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | Creation of the Work Request failed as indicated in the Step 2 response message. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

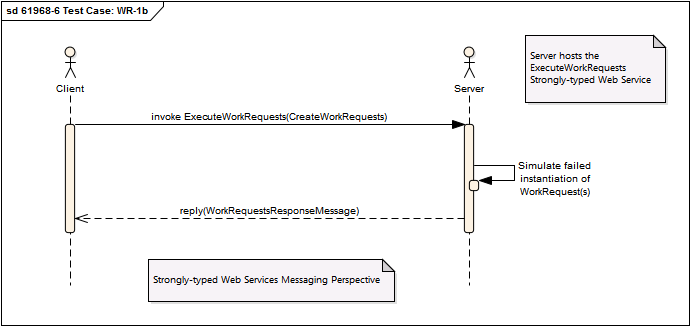


Figure ‑ Sequence Diagram for Test Case WR-1b

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateWorkRequests | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:CreateWorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-06-25T20:22:01-06:00</msg:Timestamp>

<msg:MessageID>19abfea4-1816-4ea5-9280-409b1e816d20</msg:MessageID>

<msg:CorrelationID>156345af-67e7-4d7e-81a3-250612105c0a</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<mRID>375776be-d731-433c-a41a-3eefbc289344</mRID>

<Names>

<name>WR-14657</name>

<NameType>

<name>Work Request Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>cbf227f9-dfa1-487d-b787-7f4c818ea737</mRID>

<Names>

<name>DSOP</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>57</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 82</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Harrison</name>

<number>3372</number>

<suffix>NE</suffix>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>0249dbbe-9f3b-481c-982a-1fa7ea90b45a</mRID>

<kind>repair</kind>

<lastModifiedDateTime>2015-06-16T11:55:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-06-16T11:55:24-06:00</requestDateTime>

<statusKind>waitingToBeScheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-06-16T11:55:24-06:00</createdDateTime>

<reason>Damage Reported</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<justification>Safety Hazard</justification>

<rank>1</rank>

<type>Emergency</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-06-16T17:00:00-06:00</end>

<start>2015-06-16T11:55:24-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fb92ddab-09e0-4973-a890-89b1f6700f1d</mRID>

<direction>NW</direction>

<Hazards>

<type>Exposed Conductor</type>

</Hazards>

<InternalLocation>

<BuildingName>Warehouse</BuildingName>

<BuildingNumber>2</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>101-E</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2nd building along driveway</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Rogers</name>

<number>122</number>

<prefix>N</prefix>

<suffix>SW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>07c461d4-fca9-4097-a3e1-70f478e87832</mRID>

<instruction>Repair damaged meter panel</instruction>

<subject>Damaged meter panel</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>17fa20de-8949-40d5-9bce-93b9e5a74ce5</mRID>

<critical>true</critical>

<utcNumber>8752-90765-830632</utcNumber>

</Assets>

<Crews>

<mRID>b0b5e22d-a438-4021-9a85-d745b9bcd18b</mRID>

<Names>

<name>Jacobs, Brian</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:CreateWorkRequests>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | WorkRequests.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | WorkRequestsResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:WorkRequestsResponseMessage xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-06-25T20:22:02-06:00</msg:Timestamp>

<msg:MessageID>156345af-67e7-4d7e-81a3-250612105c0a</msg:MessageID>

<msg:CorrelationID>156345af-67e7-4d7e-81a3-250612105c0a</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>FAILED</msg:Result>

<msg:Error>

<msg:code>6.1</msg:code>

<msg:level>FATAL</msg:level>

<msg:details>Request cancelled per business rule</msg:details>

<msg:ID idType="Work Request Number" idAuthority="Utility XYZ" kind="name" objectType="WorkRequest">WR-14657</msg:ID>

</msg:Error>

</tns:Reply>

</tns:WorkRequestsResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Work Request | http://xx.xxx.xxx.xxx/ | create | WorkRequests |  |
| 2 | Failure Response | http://xx.xxx.xxx.xxx/ | reply | WorkRequests |  |

## WR-1c: Client requests creation of two Work Requests and Server replies (Success - Two Work Requests in a single message)

In this test case, the Client requests the Server to instantiate two Work Requests. The Server returns a response message indicating success with no errors.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the Work Requests would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "create" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | Two new Work Requests are created with the Names identifiers that were passed in the request message. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

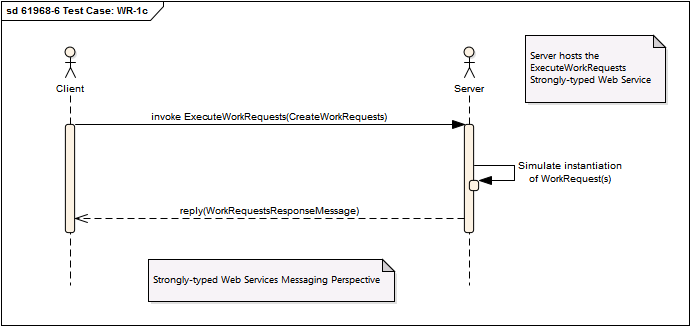


Figure ‑ Sequence Diagram for Test Case WR-1c

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateWorkRequests | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:CreateWorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-01T20:21:01-06:00</msg:Timestamp>

<msg:MessageID>9330db07-bbb8-475c-8353-f865659d703e</msg:MessageID>

<msg:CorrelationID>35fc5aab-42ad-4c23-97c0-8541b8be8b97</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<Names>

<name>WR-14433</name>

</Names>

<Organisation>

<Names>

<name>DSOP</name>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>57</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 82</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Harrison</name>

<number>3372</number>

<suffix>NE</suffix>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>9330db07-bbb8-475c-8353-f865659d703e</mRID>

<kind>repair</kind>

<lastModifiedDateTime>2015-07-16T11:55:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-16T11:55:24-06:00</requestDateTime>

<statusKind>waitingToBeScheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-01T11:55:24-06:00</createdDateTime>

<reason>Damage Reported</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<justification>Safety Hazard</justification>

<rank>1</rank>

<type>Emergency</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-16T17:00:00-06:00</end>

<start>2015-07-16T11:55:24-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fb92ddab-09e0-4973-a890-89b1f6700f1d</mRID>

<direction>NW</direction>

<Hazards>

<type>Exposed Conductor</type>

</Hazards>

<InternalLocation>

<BuildingName>Warehouse</BuildingName>

<BuildingNumber>2</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>101-E</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2nd building along driveway</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Rogers</name>

<number>122</number>

<prefix>N</prefix>

<suffix>SW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>5364d65c-92b3-4ae6-9bf4-403c3edc6051</mRID>

<instruction>Repair damaged meter panel</instruction>

<subject>Damaged meter panel</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>17fa20de-8949-40d5-9bce-93b9e5a74ce5</mRID>

<critical>true</critical>

<utcNumber>8752-90765-830632</utcNumber>

</Assets>

<Crews>

<Names>

<name>Jacobs, Brian</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

<WorkRequest>

<Names>

<name>WR-14434</name>

</Names>

<Organisation>

<Names>

<name>DSOP2</name>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>58</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 83</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Harrison</name>

<number>3372</number>

<suffix>NE</suffix>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>5364d65c-92b3-4ae6-9bf4-403c3edc6051</mRID>

<kind>repair</kind>

<lastModifiedDateTime>2015-07-01T11:55:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-01T11:55:24-06:00</requestDateTime>

<statusKind>waitingToBeScheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-01T11:55:24-06:00</createdDateTime>

<reason>Damage Reported</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<justification>Safety Hazard</justification>

<rank>1</rank>

<type>Emergency</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-16T17:00:00-06:00</end>

<start>2015-07-16T11:55:24-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fb92ddab-09e0-4973-a890-89b1f6700f1d</mRID>

<direction>NW</direction>

<Hazards>

<type>Exposed Conductor</type>

</Hazards>

<InternalLocation>

<BuildingName>Warehouse</BuildingName>

<BuildingNumber>2</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>101-E</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2nd building along driveway</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Rogers</name>

<number>122</number>

<prefix>N</prefix>

<suffix>SW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>327ea2fa-a831-4823-a76b-d651fd69d5d2</mRID>

<instruction>Repair damaged meter panel</instruction>

<subject>Damaged meter panel</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>17fa20de-8949-40d5-9bce-93b9e5a74ce5</mRID>

<critical>true</critical>

<utcNumber>8752-90765-830632</utcNumber>

</Assets>

<Crews>

<Names>

<name>Jacobs, Brian</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:CreateWorkRequests>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | WorkRequests.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | WorkRequestsResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:WorkRequestsResponseMessage xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-01T20:21:02-06:00</msg:Timestamp>

<msg:MessageID>c22702a7-a6f4-459f-ade1-8723b7d8f473</msg:MessageID>

<msg:CorrelationID>35fc5aab-42ad-4c23-97c0-8541b8be8b97</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:WorkRequestsResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Work Request | http://xx.xxx.xxx.xxx/ | create | WorkRequests |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | WorkRequests |  |

## WR-1d: Client requests creation of two Work Requests and Server replies (Two Work Requests in a single message - One succeeds and one fails)

In this test case, the Client requests the Server to instantiate two Work Requests. The Server returns a response message indicating that instantiation of the second Work Request failed. Since no error is reported for the first Work Request, the interpretation of the response message is that the instantiation of the first Work Request succeeded.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the first of the two Work Requests would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "create" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | One new Work Request is created with the Names identifier that was passed in the request message. An error is returned indicating that instantiation of the second Work Request failed. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

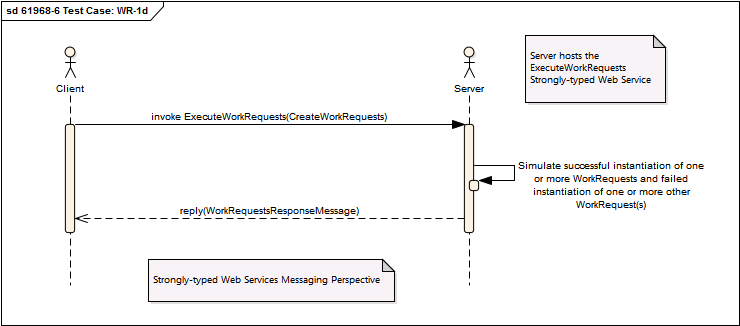


Figure ‑ Sequence Diagram for Test Case WR-1d

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateWorkRequests | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:CreateWorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-01T22:21:01-06:00</msg:Timestamp>

<msg:MessageID>c66efe7e-2e3f-4792-930a-9af66ba3f512</msg:MessageID>

<msg:CorrelationID>061dd7b0-3ff5-4087-94b2-66ca780f1411</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<Names>

<name>WR-15433</name>

</Names>

<Organisation>

<Names>

<name>DSOP</name>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>57</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 82</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Harrison</name>

<number>3372</number>

<suffix>NE</suffix>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<kind>repair</kind>

<lastModifiedDateTime>2015-07-16T11:55:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-16T11:55:24-06:00</requestDateTime>

<statusKind>waitingToBeScheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-01T11:55:24-06:00</createdDateTime>

<reason>Damage Reported</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<justification>Safety Hazard</justification>

<rank>1</rank>

<type>Emergency</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-16T17:00:00-06:00</end>

<start>2015-07-16T11:55:24-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fb92ddab-09e0-4973-a890-89b1f6700f1d</mRID>

<direction>NW</direction>

<Hazards>

<type>Exposed Conductor</type>

</Hazards>

<InternalLocation>

<BuildingName>Warehouse</BuildingName>

<BuildingNumber>2</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>101-E</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2nd building along driveway</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Rogers</name>

<number>122</number>

<prefix>N</prefix>

<suffix>SW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>c14d3151-b107-4231-9daf-ebf0b51251e9</mRID>

<instruction>Repair damaged meter panel</instruction>

<subject>Damaged meter panel</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>17fa20de-8949-40d5-9bce-93b9e5a74ce5</mRID>

<critical>true</critical>

<utcNumber>8752-90765-830632</utcNumber>

</Assets>

<Crews>

<Names>

<name>Jacobs, Brian</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

<WorkRequest>

<Names>

<name>WR-15434</name>

</Names>

<Organisation>

<Names>

<name>DSOP2</name>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>58</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 83</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Harrison</name>

<number>3372</number>

<suffix>NE</suffix>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>5364d65c-92b3-4ae6-9bf4-403c3edc6051</mRID>

<kind>repair</kind>

<lastModifiedDateTime>2015-07-01T11:55:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-01T11:55:24-06:00</requestDateTime>

<statusKind>waitingToBeScheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-01T11:55:24-06:00</createdDateTime>

<reason>Damage Reported</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<justification>Safety Hazard</justification>

<rank>1</rank>

<type>Emergency</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-16T17:00:00-06:00</end>

<start>2015-07-16T11:55:24-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fb92ddab-09e0-4973-a890-89b1f6700f1d</mRID>

<direction>NW</direction>

<Hazards>

<type>Exposed Conductor</type>

</Hazards>

<InternalLocation>

<BuildingName>Warehouse</BuildingName>

<BuildingNumber>2</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>101-E</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2nd building along driveway</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Rogers</name>

<number>122</number>

<prefix>N</prefix>

<suffix>SW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>88b70f44-443e-4a64-9719-04640130118c</mRID>

<instruction>Repair damaged meter panel</instruction>

<subject>Damaged meter panel</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>17fa20de-8949-40d5-9bce-93b9e5a74ce5</mRID>

<critical>true</critical>

<utcNumber>8752-90765-830632</utcNumber>

</Assets>

<Crews>

<Names>

<name>Paulson, Grant</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:CreateWorkRequests>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | WorkRequests.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | WorkRequestsResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:WorkRequestsResponseMessage xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-01T22:21:02-06:00</msg:Timestamp>

<msg:MessageID>156345af-67e7-4d7e-81a3-250612105c0a</msg:MessageID>

<msg:CorrelationID>061dd7b0-3ff5-4087-94b2-66ca780f1411</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>FAILED</msg:Result>

<msg:Error>

<msg:code>6.1</msg:code>

<msg:level>FATAL</msg:level>

<msg:details>Request cancelled per business rule</msg:details>

<msg:ID idType="" idAuthority="" kind="name" objectType="WorkRequest">WR-15434</msg:ID>

</msg:Error>

</tns:Reply>

</tns:WorkRequestsResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Work Request | http://xx.xxx.xxx.xxx/ | create | WorkRequests |  |
| 2 | Mixed Success / Failure Response | http://xx.xxx.xxx.xxx/ | reply | WorkRequests |  |

## WR-2a: Client requests modification of an existing Work Request and Server replies (Success - Change schedule)

In this test case, the Client requests the Server to modify an existing Work Request by changing the schedule. The Server returns a response message indicating success with no errors.

*Note that to change only the schedule, providing an updated start time and an updated end time, the only required content in the payload is the identifiers of the WorkRequest and Work (item) plus the new start and end times.*

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Work Request with a mRID identifier of 375776be-d731-433c-a41a-3eefbc289344, as created in test case WR-1a, is assumed to exist. |
| **Post Condition(s):** | The subject Work Request is modified to have a new schedule. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

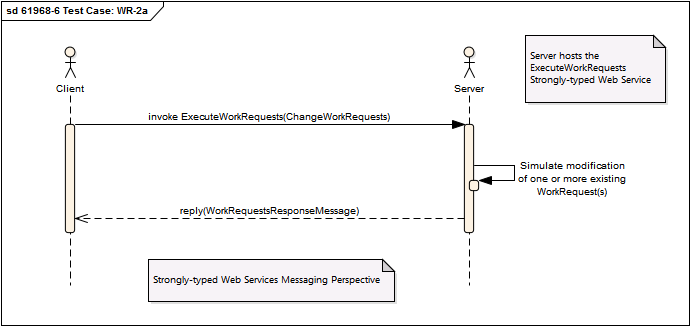


Figure ‑ Sequence Diagram for Test Case WR-2a

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ChangeWorkRequests | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:ChangeWorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>change</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-01T16:40:33-06:00</msg:Timestamp>

<msg:MessageID>f1be66ae-842f-42ac-a626-27d7f5948497</msg:MessageID>

<msg:CorrelationID>67266933-f509-4d53-923a-fe745328f806</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<mRID>375776be-d731-433c-a41a-3eefbc289344</mRID>

<Work>

<mRID>0249dbbe-9f3b-481c-982a-1fa7ea90b45a</mRID>

<TimeSchedules>

<scheduleInterval>

<end>2015-07-16T17:00:00-06:00</end>

<start>2015-07-16T12:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

</Work>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:ChangeWorkRequests>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | WorkRequests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | WorkRequestsResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:WorkRequestsResponseMessage xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-01T16:40:35-06:00</msg:Timestamp>

<msg:MessageID>5dbc69be-0622-4d47-bf4c-c71087cf2e45</msg:MessageID>

<msg:CorrelationID>67266933-f509-4d53-923a-fe745328f806</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:WorkRequestsResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Change Work Request | http://xx.xxx.xxx.xxx/ | change | WorkRequests |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | WorkRequests |  |

## WR-2b: Client requests modification of an existing Work Request and Server replies (Success - Add a second Crew)

In this test case, the Client requests the Server to modify an existing Work Request by adding a additional Crew to the Work (item) in the Work Request. The Server returns a response message indicating success with no errors.

*Note that to add a crew, the only required content in the payload is the identifiers of the WorkRequest and Work (item) plus the identifiers and (if applicable) details for the new crew.*

*(Note also that if the intent had been to remove the existing crew and substitute a new crew, it would be necessary to leverage the OperationSet technique illustrated in test case WR-3 in order to remove the existing crew. A second transaction, similar to the one illustrated in this test case, could then be performed to add the new crew. If desired, the two operations (deleting one crew and adding anothe crew, could be combined in one request message using an OperationSet with two operations.)*

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Work Request with a Names.name identifier of WR-14433 as created in test case WR-1c is assumed to exist. |
| **Post Condition(s):** | The subject Work Request is modified to have a second crew. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

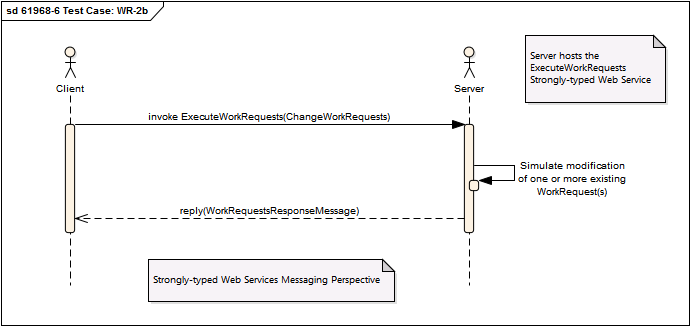


Figure ‑ Sequence Diagram for Test Case WR-2b

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ChangeWorkRequests | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:ChangeWorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>change</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-01T17:50:10-06:00</msg:Timestamp>

<msg:MessageID>85cf9b8f-37d5-427c-ab3c-86a567126f05</msg:MessageID>

<msg:CorrelationID>8bfa12c5-4eb6-4c8e-bc87-19314c6f9a24</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<Names>

<name>WR-14433</name>

</Names>

<Work>

<mRID>9330db07-bbb8-475c-8353-f865659d703e</mRID>

<WorkTasks>

<mRID>5364d65c-92b3-4ae6-9bf4-403c3edc6051</mRID>

<Crews>

<Names>

<name>Construction Team 4</name>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:ChangeWorkRequests>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | WorkRequests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | WorkRequestsResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:WorkRequestsResponseMessage xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-01T17:50:11-06:00</msg:Timestamp>

<msg:MessageID>04b0768a-8258-45bf-a6f4-1f1ba74b05ae</msg:MessageID>

<msg:CorrelationID>8bfa12c5-4eb6-4c8e-bc87-19314c6f9a24</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:WorkRequestsResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Change Work Request | http://xx.xxx.xxx.xxx/ | change | WorkRequests |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | WorkRequests |  |

## WR-3: Client requests modification of an existing Work Request and Server replies (Success - Delete a Crew)

In this test case, the Client requests the Server to modify an existing Work Request by deleting one of the two Crews assigned to the Work (item) in the Work Request. The Server returns a response message indicating success with no errors.

***IMPORTANT: Because the intent is to remove an existing crew, it is necessary to leverage the OperationSet technique. Please refer to the subsection entitled 61968 Part 100 Considerations in Section 2 and Annex D for a more complete discussion concerning the use of OperationSets to accomplish the deletion of attributes and/or association classes. A crew assignment is an example of an association class - in the UML a Crew is a separate CIM object that is associated with a Work (item) in a WorkRequest. Attributes, in contrast, are just that - they appear in the UML as an attribute of a CIM Class (sometimes inherited from a parent class).***

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, WorkRequest WR-14433 already exists and has two crews, with Names.name identifiers of "Jacobs, Brian" and "Construction Team 4" assigned. This test case will delete the assignment of "Jacobs, Brian".

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Work Request with a Work (item) having 2 assigned crews and a WorkRequest Names.name identifier of WR-14433, as created in test case WR-1c and modified in test case WR-2b, is assumed to exist. |
| **Post Condition(s):** | The subject Work Request is modified to have crew "Jacobs, Brian" removed. This leaves the Work Request having a single assigned Crew of "Construction team 4". |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

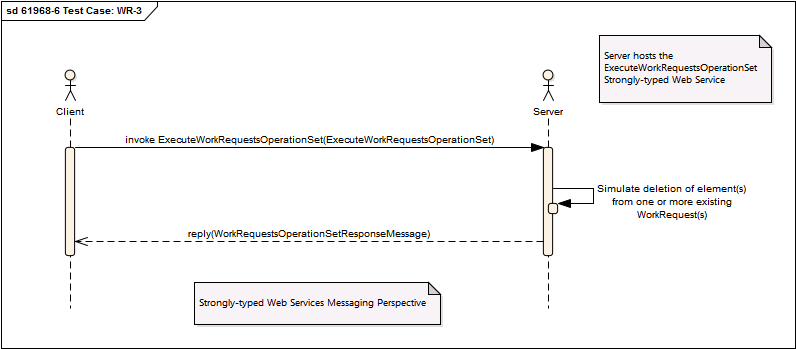


Figure ‑ Sequence Diagram for Test Case WR-3

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequestsOperationSet.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsOperationSetMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ExecuteWorkRequestsOperationSet | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:ExecuteWorkRequestsOperationSet xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsOperationSetMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsOperationSetMessage WorkRequestsOperationSetMessage.xsd">

<tns:Header>

<Verb>execute</Verb>

<Noun>OperationSet</Noun>

<Timestamp>2015-07-02T12:50:10-06:00</Timestamp>

<MessageID>cf03657b-4c41-4a8e-9afe-69df5ee70755</MessageID>

<CorrelationID>e5961833-4caa-4586-b281-7e644cd818c0</CorrelationID>

</tns:Header>

<tns:Payload>

<tns:OperationSet>

<Operation>

<operationId>1</operationId>

<noun>WorkRequests</noun>

<verb>delete</verb>

<elementOperation>true</elementOperation>

<WorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequests# WorkRequests.xsd">

<WorkRequest>

<Names>

<name>WR-14433</name>

</Names>

<Work>

<mRID>9330db07-bbb8-475c-8353-f865659d703e</mRID>

<WorkTasks>

<mRID>5364d65c-92b3-4ae6-9bf4-403c3edc6051</mRID>

<Crews>

<Names>

<name>Jacobs, Brian"</name>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

</WorkRequests>

</Operation>

</tns:OperationSet>

</tns:Payload>

</tns:ExecuteWorkRequestsOperationSet>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequestsOperationSet.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | WorkRequests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsOperationSetMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | WorkRequestsOperationSetResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:WorkRequestsOperationSetResponseMessage xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsOperationSetMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsOperationSetMessage WorkRequestsOperationSetMessage.xsd">

<tns:Header>

<Verb>reply</Verb>

<Noun>OperationSet</Noun>

<Timestamp>2015-07-02T12:50:13-06:00</Timestamp>

<MessageID>d4ec0c10-3978-4063-9a05-476eb9978de1</MessageID>

<CorrelationID>e5961833-4caa-4586-b281-7e644cd818c0</CorrelationID>

</tns:Header>

<tns:Reply>

<Result>OK</Result>

<Error>

<code>0.0</code>

<operationId>1</operationId>

</Error>

<operationId>1</operationId>

</tns:Reply>

</tns:WorkRequestsOperationSetResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Delete Details from existing Work Request | http://xx.xxx.xxx.xxx/ | execute | OperationSet\* |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | OperationSet\* |  |

\*The OperationSet includes a single Operation having:

* verb = "delete"
* noun = "WorkRequests"
* elementOperation = "true"

## WR-4: Client requests deletion of an existing Work Request and Server replies (Success)

In this test case, the Client requests the Server to delete an existing Work Request (in its entirety). The Server returns a response message indicating success with no errors.

It is noted that in practice, WorkRequests would seldom be deleted; instead they would more likely be closed or cancelled. Nevertheless, this use case is included for completeness and to distinguish the deletion of a Work Request in its entirety from the deletion of attributes or associated classes from an existing Work Request (as illustrated in test case WR-3).

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, WorkRequest WR-14657, which was previously created in test case WR-1a, will be deleted. However, for illustrative purposes, this deletion will be processed by referencing the mRID of the existing WorkRequest ("375776be-d731-433c-a41a-3eefbc289344", as assigned when it was created in test case WR-1a) rather than its Names.name identifier of WR-14657.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Work Request with a Names.name identifier of WR-14657 and mRID of 375776be-d731-433c-a41a-3eefbc289344, as created in test case WR-1a, is assumed to exist. |
| **Post Condition(s):** | The subject Work Request is deleted. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

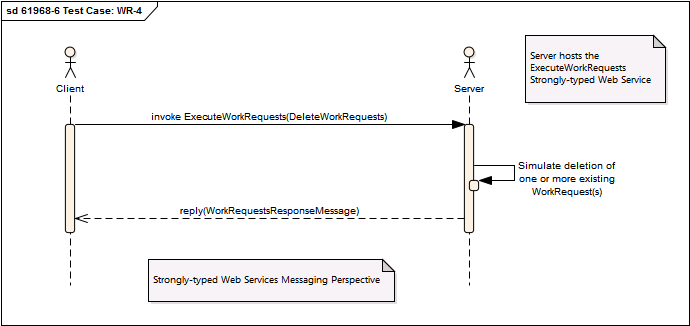


Figure ‑ Sequence Diagram for Test Case WR-4

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | DeleteWorkRequests | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:DeleteWorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>delete</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-02T14:06:43-06:00</msg:Timestamp>

<msg:MessageID>01a1488f-00d5-4e7c-86d1-0713a86d98e6</msg:MessageID>

<msg:CorrelationID>c2da1ffc-6187-4420-b53a-a07eedcc760e</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<mRID>375776be-d731-433c-a41a-3eefbc289344</mRID>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:DeleteWorkRequests>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteWorkRequests.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | WorkRequests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | WorkRequestsResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:WorkRequestsResponseMessage xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-02T14:06:46-06:00</msg:Timestamp>

<msg:MessageID>3cdea278-ad63-46f0-8766-ec67d16fcba5</msg:MessageID>

<msg:CorrelationID>c2da1ffc-6187-4420-b53a-a07eedcc760e</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:WorkRequestsResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Delete existing Work Request | http://xx.xxx.xxx.xxx/ | delete | WorkRequests |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | WorkRequests |  |

## WR-5a: Client requests retrieval of an existing Work Request and Server replies (Success - Single Work Request)

In this test case, the Client requests the Server to provide the details of a single Work Request identified by its Names.name identifier of WR-14434. This Work Request was previously created in test case WR-1c. The Server returns a response message indicating success with no errors and including the details of the current state of the Work Request in the payload section of the response message.

*Note 1: The parameters for the request query (in this case the Names.name identifier of the Work Request whose details are being requested) are supplied using XML generated using the GetMeterReadings profile. The xml for this request is placed in the Request section of the Message envelope and not in the Payload section of the message envelope.*

*Note 2: Not all response messages will contain a payload; only those for which the query returns one or more Work Requests will have contents in the payload section. In response messages that contain a payload, the payload must validate against the "constrained" version of the WorkRequests.xsd that is used for "create" scenarios and not the "unconstrained" version that is used for "change or delete" scenarios.*

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Applications Being Tested may contain any of the request and payload elements and attributes permitted by the XSDs found in Annex G and F respectively.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Work Request with a Names.name identifier of WR-14434, as created in test case WR-1c, is assumed to exist. |
| **Post Condition(s):** | The full content of the subject Work Request is returned in response to the query. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

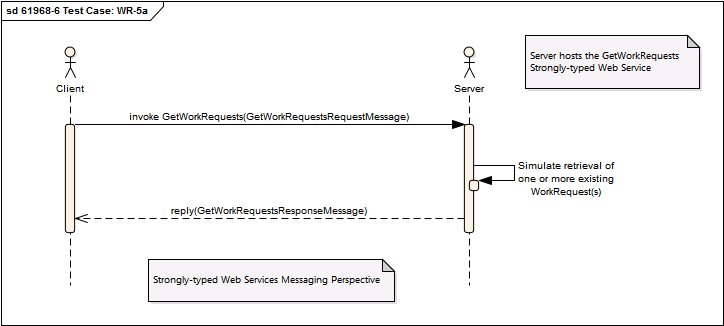


Figure ‑ Sequence Diagram for Test Case WR-5a

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | GetWorkRequests.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'} |
| **Part 6 XSD** | GetWork Requests.xsd  WorkRequests.xsd | {02-Part 6 XSDs modified by EPRI\'get' Profiles}  {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | GetWorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd} |
| **Message Stereotype** | GetWorkRequestsRequestMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:GetWorkRequestsRequestMessage xmlns="http://iec.ch/TC57/2015/GetWorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/GetWorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/GetWorkRequestsMessage GetWorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>get</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-06T09:24:02-06:00</msg:Timestamp>

<msg:MessageID>c2728003-5ac1-4df2-959e-e3d172b0552d</msg:MessageID>

<msg:CorrelationID>9bcb67e3-8ca2-480c-875b-afaea07297cc</msg:CorrelationID>

</tns:Header>

<tns:Request>

<GetWorkRequests>

<WorkRequest>

<Names>

<name>WR-14434</name>

</Names>

</WorkRequest>

</GetWorkRequests>

</tns:Request>

</tns:GetWorkRequestsRequestMessage>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |  |
| --- | --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** | |
| **WSDL** | GetWorkRequests.wsdl | | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'} |
| **Part 6 XSD** | WorkRequests.xsd | | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | GetWorkRequestsMessage.xsd | | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd} |
| **Message Stereotype** | GetWorkRequestsResponseMessage | | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:GetWorkRequestsResponseMessage xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/GetWorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/GetWorkRequestsMessage GetWorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-06T09:24:03-06:00</msg:Timestamp>

<msg:MessageID>f9809598-37b7-4c0d-b927-306714e4e7ce</msg:MessageID>

<msg:CorrelationID>9bcb67e3-8ca2-480c-875b-afaea07297cc</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<Names>

<name>WR-14434</name>

</Names>

<Organisation>

<Names>

<name>DSOP2</name>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>58</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 83</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Harrison</name>

<number>3372</number>

<suffix>NE</suffix>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>5364d65c-92b3-4ae6-9bf4-403c3edc6051</mRID>

<kind>repair</kind>

<lastModifiedDateTime>2015-07-01T11:55:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-01T11:55:24-06:00</requestDateTime>

<statusKind>waitingToBeScheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-01T11:55:24-06:00</createdDateTime>

<reason>Damage Reported</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<justification>Safety Hazard</justification>

<rank>1</rank>

<type>Emergency</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-16T17:00:00-06:00</end>

<start>2015-07-16T11:55:24-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fb92ddab-09e0-4973-a890-89b1f6700f1d</mRID>

<direction>NW</direction>

<Hazards>

<type>Exposed Conductor</type>

</Hazards>

<InternalLocation>

<BuildingName>Warehouse</BuildingName>

<BuildingNumber>2</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>101-E</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2nd building along driveway</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Rogers</name>

<number>122</number>

<prefix>N</prefix>

<suffix>SW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>327ea2fa-a831-4823-a76b-d651fd69d5d2</mRID>

<instruction>Repair damaged meter panel</instruction>

<subject>Damaged meter panel</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>17fa20de-8949-40d5-9bce-93b9e5a74ce5</mRID>

<critical>true</critical>

<utcNumber>8752-90765-830632</utcNumber>

</Assets>

<Crews>

<Names>

<name>Jacobs, Brian</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:GetWorkRequestsResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Get Work Requests | http://xx.xxx.xxx.xxx/ | get | WorkRequests |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | WorkRequests |  |

## WR-5b: Client requests retrieval of Work Requests and Server replies (Success - Two Work Requests in a single message)

In this test case, the Client requests the Server to provide the details of Work Request(s) assigned to the Crew "Jacobs, Brian". Test cases WR-1a, WR-1c, and WR-1d previously created a total of four Work Requests assigned to "Jacobs, Brian"; however, test cases WR-3 removed "Jacobs, Brian" from one of the Work Requsts and test case WR-4 deleted another Work Request assigned to 'Jacobs, Brian". Consequently, this query for Work Requests assigned to "Jacobs, Brian returns two Work Requests (WR-14434 and WR-15433). The Server returns a response message indicating success with no errors and including the details of the current state of the two Work Requests in the payload section of the response message.

*Note 1: The parameters for the request query (in this case the Names.name identifier of the Crew to whom the Work Requests were assigned) are supplied using XML generated using the GetMeterReadings profile . The xml for this request is placed in the Request section of the Message envelope and not in the Payload section of the message envelope.*

*Note 2: Not all response messages will contain a payload; only those for which the query returns one or more Work Requests will have contents in the payload section. In response messages that contain a payload, the payload must validate against the "constrained" version of the WorkRequests.xsd that is used for "create" scenarios and not the "unconstrained" version that is used for "change or delete" scenarios.*

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Applications Being Tested may contain any of the request and payload elements and attributes permitted by the XSDs found in Annex G and F respectively.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | Work Requests with Names.name identifiers of WR-14434 and WR-15433, as created in test cases WR-1c and WR-1d respectively, are assumed to exist. |
| **Post Condition(s):** | The full contents of the subject Work Requests are returned in response to the query. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

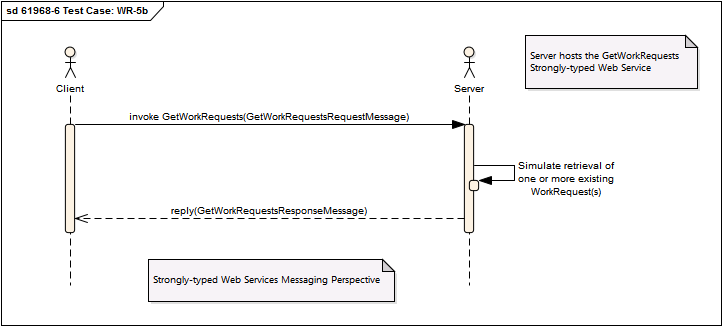


Figure ‑ Sequence Diagram for Test Case WR-5b

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | GetWorkRequests.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'} |
| **Part 6 XSD** | GetWork Requests.xsd  WorkRequests.xsd | {02-Part 6 XSDs modified by EPRI\'get' Profiles}  {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | GetWorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd} |
| **Message Stereotype** | GetWorkRequestsRequestMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:GetWorkRequestsRequestMessage xmlns="http://iec.ch/TC57/2015/GetWorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/GetWorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/GetWorkRequestsMessage GetWorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>get</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-06T17:36:14-06:00</msg:Timestamp>

<msg:MessageID>4bf4e70f-538f-4f4e-98b9-2f7ac9709095</msg:MessageID>

<msg:CorrelationID>96136dd7-0cf8-473e-9f44-94f3a33cddff</msg:CorrelationID>

</tns:Header>

<tns:Request>

<GetWorkRequests>

<Crew>

<Names>

<name>Jacobs, Brian</name>

</Names>

</Crew>

</GetWorkRequests>

</tns:Request>

</tns:GetWorkRequestsRequestMessage>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |  |
| --- | --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** | |
| **WSDL** | GetWorkRequests.wsdl | | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'} |
| **Part 6 XSD** | WorkRequests.xsd | | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | GetWorkRequestsMessage.xsd | | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd} |
| **Message Stereotype** | GetWorkRequestsResponseMessage | | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:GetWorkRequestsResponseMessage xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/GetWorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/GetWorkRequestsMessage GetWorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-06T17:36:16-06:00</msg:Timestamp>

<msg:MessageID>f80c625e-fcac-468a-a6b0-79f129fabc68</msg:MessageID>

<msg:CorrelationID>96136dd7-0cf8-473e-9f44-94f3a33cddff</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<Names>

<name>WR-14434</name>

</Names>

<Organisation>

<Names>

<name>DSOP2</name>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>58</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 83</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Harrison</name>

<number>3372</number>

<suffix>NE</suffix>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>5364d65c-92b3-4ae6-9bf4-403c3edc6051</mRID>

<kind>repair</kind>

<lastModifiedDateTime>2015-07-01T11:55:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-01T11:55:24-06:00</requestDateTime>

<statusKind>waitingToBeScheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-01T11:55:24-06:00</createdDateTime>

<reason>Damage Reported</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<justification>Safety Hazard</justification>

<rank>1</rank>

<type>Emergency</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-16T17:00:00-06:00</end>

<start>2015-07-16T11:55:24-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fb92ddab-09e0-4973-a890-89b1f6700f1d</mRID>

<direction>NW</direction>

<Hazards>

<type>Exposed Conductor</type>

</Hazards>

<InternalLocation>

<BuildingName>Warehouse</BuildingName>

<BuildingNumber>2</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>101-E</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2nd building along driveway</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Rogers</name>

<number>122</number>

<prefix>N</prefix>

<suffix>SW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>327ea2fa-a831-4823-a76b-d651fd69d5d2</mRID>

<instruction>Repair damaged meter panel</instruction>

<subject>Damaged meter panel</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>17fa20de-8949-40d5-9bce-93b9e5a74ce5</mRID>

<critical>true</critical>

<utcNumber>8752-90765-830632</utcNumber>

</Assets>

<Crews>

<Names>

<name>Jacobs, Brian</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

<WorkRequest>

<Names>

<name>WR-15433</name>

</Names>

<Organisation>

<Names>

<name>DSOP</name>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>57</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 82</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Harrison</name>

<number>3372</number>

<suffix>NE</suffix>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<kind>repair</kind>

<lastModifiedDateTime>2015-07-16T11:55:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-16T11:55:24-06:00</requestDateTime>

<statusKind>waitingToBeScheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-01T11:55:24-06:00</createdDateTime>

<reason>Damage Reported</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<justification>Safety Hazard</justification>

<rank>1</rank>

<type>Emergency</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-16T17:00:00-06:00</end>

<start>2015-07-16T11:55:24-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fb92ddab-09e0-4973-a890-89b1f6700f1d</mRID>

<direction>NW</direction>

<Hazards>

<type>Exposed Conductor</type>

</Hazards>

<InternalLocation>

<BuildingName>Warehouse</BuildingName>

<BuildingNumber>2</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>101-E</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2nd building along driveway</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Rogers</name>

<number>122</number>

<prefix>N</prefix>

<suffix>SW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>c14d3151-b107-4231-9daf-ebf0b51251e9</mRID>

<instruction>Repair damaged meter panel</instruction>

<subject>Damaged meter panel</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>17fa20de-8949-40d5-9bce-93b9e5a74ce5</mRID>

<critical>true</critical>

<utcNumber>8752-90765-830632</utcNumber>

</Assets>

<Crews>

<Names>

<name>Jacobs, Brian</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:GetWorkRequestsResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Get Work Requests | http://xx.xxx.xxx.xxx/ | change | WorkRequests |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | WorkRequests |  |

## WR-6: Server informs Client of the creation of Work Requests (Two Work Requests in a single message)

In this test case, the Server informs the Client of the creation of two Work Requests. Such a notification may occur if the Client is not the original requestor, but instead is being notified of the Work Requests instantiated directly within the Server or as a result of a request by a third system. The notification may occur immediately upon instantiation or at some later date/time. This is an asynchronous notification using an Event Stereotype message. There is no response message.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the Work Requests would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "created" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | It is assumed that Work Requests WR-24255 and WR-24256 were created at different times earlier in the day. |
| **Post Condition(s):** | The Client is informed of the details of two Work Requests created earlier in the day. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

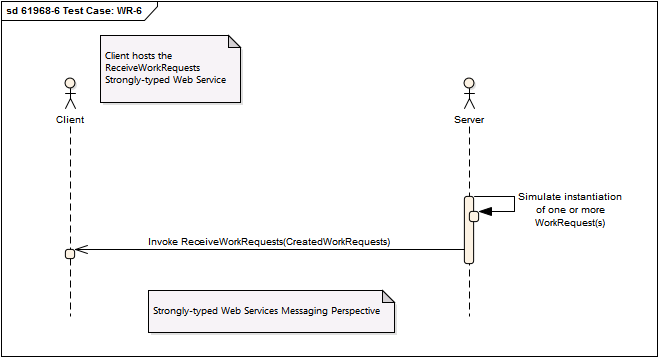


Figure ‑ Sequence Diagram for Test Case WR-6

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveWorkRequests.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreatedWorkRequests | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:CreatedWorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>created</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-06T18:33:55-06:00</msg:Timestamp>

<msg:MessageID>0923fa41-22b4-4200-a26e-4ca06befd579</msg:MessageID>

</tns:Header>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<Names>

<name>WR-24255</name>

</Names>

<Organisation>

<Names>

<name>DSOP3</name>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>66</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 97</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Grant</name>

<number>1122</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>f3ff5e26-9ef6-4b54-a2f8-b1132fabd0fb</mRID>

<kind>inspection</kind>

<lastModifiedDateTime>2015-07-06T15:27:02-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-06T15:27:02-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-06T15:27:02-06:00</createdDateTime>

<reason>Routine Inspection</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Routine</type>

</priority>

<TimeSchedules>

<kind>estimate</kind>

<scheduleInterval>

<end>2015-07-22T17:00:00-06:00</end>

<start>2015-07-22T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>af00b889-bd82-4fb3-9a53-87b944c51784</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>175 N Ellis Rd NW, Cedar Rapids, IA 52405</addressGeneral>

<name>Ellis</name>

<number>175</number>

<prefix>N</prefix>

<suffix>NW</suffix>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52405</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>f72e0137-3d98-47cd-bc5f-0bb77d0d2733</mRID>

<instruction>Perform Routine Inspection</instruction>

<subject>Inspect meter</subject>

<taskKind>investigate</taskKind>

<Crews>

<Names>

<name>Edmonds, Jeff</name>

<NameType>

<name>Crew ID</name>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

<WorkRequest>

<Names>

<name>WR-24256</name>

</Names>

<Organisation>

<Names>

<name>DSOP4</name>

</Names>

<phone1>

<areaCode>800</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>22</extension>

<localNumber>8000</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>Mail Stop 4</addressGeneral>

<name>Adirondack</name>

<number>3136</number>

<suffix>NE</suffix>

<type>Dr</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<kind>inspection</kind>

<lastModifiedDateTime>2015-07-16T16:22:31-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-16T16:22:31-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-16T16:22:31-06:00</createdDateTime>

<reason>Routine Inspection</reason>

<type>Work Request Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Routine</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-25T17:00:00-06:00</end>

<start>2015-07-25T09:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>9044a1f6-f988-4244-bb68-17b3f3d6979d</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>24456 Mt Vernon Rd SE, Cedar Rapids, IA</addressGeneral>

<buildingName>Warehouse</buildingName>

<name>Mt Vernon</name>

<number>24456</number>

<suffix>SE</suffix>

<type>Rd</type>

<withinTownLimits>false</withinTownLimits>

</streetDetail>

<townDetail>

<code>52403</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>541dc520-2959-4da6-b3e2-087e7a58b754</mRID>

<instruction>Perform Routine Inspection</instruction>

<subject>Inspect meter</subject>

<taskKind>investigate</taskKind>

<Crews>

<Names>

<name>Michels, Barbara</name>

<NameType>

<name>Crew ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Crews>

</WorkTasks>

</Work>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:CreatedWorkRequests>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Created Work Requests Notification | http://xx.xxx.xxx.xxx/ | created | WorkRequests |  |

## WR-7: Server informs Client of modification of an existing Work Request (Change priority and update LastModifiedDateTime)

In this test case, the Server informs the Client that the priority of an existing Work Request has been changed from 3-Routine to 4-High. In addition, the time at which this change occurred is used to update the LastModifiedDateTime element. Such a notification may occur if the Client is not the original requestor of the change, but instead is being notified of the change made directly within the Server or as a result of a request by a third system. The notification may occur immediately at the time of the change or at some later date/time. This is an asynchronous notification using an Event Stereotype message. There is no response message.

In this test case, Work Request WR-24255 was previously created with a priority of 3-Routine and the change in priority occurred earlier in the day.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Work Request with a Names.name identifier of WR-24255 and a priority of 3-Routine, as created in test case WR-6, is assumed to exist. |
| **Post Condition(s):** | The Client is informed that the subject Work Request has been modified to have a priority of 2-High and a new LastModifiedDateTime. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

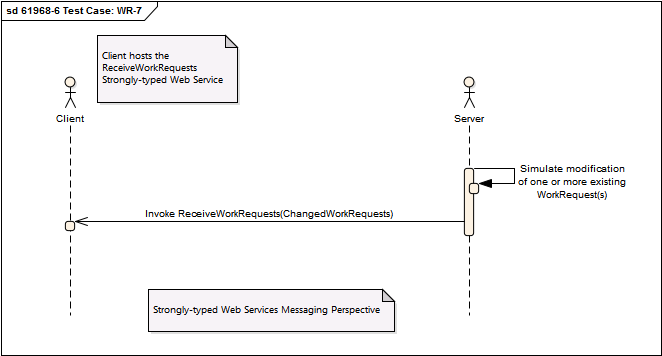


Figure ‑ Sequence Diagram for Test Case WR-7

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveWorkRequests.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ChangedWorkRequests | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:ChangedWorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>changed</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-06T20:07:39-06:00</msg:Timestamp>

<msg:MessageID>838a2b89-efc4-45b2-8341-abfb14dc28de</msg:MessageID>

</tns:Header>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<Names>

<name>WR-24255</name>

</Names>

<Work>

<mRID>f3ff5e26-9ef6-4b54-a2f8-b1132fabd0fb</mRID>

<lastModifiedDateTime>2015-07-06T15:37:02-06:00</lastModifiedDateTime>

<priority>

<rank>2</rank>

<type>High</type>

</priority>

</Work>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:ChangedWorkRequests>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Changed Work Request Notification | http://xx.xxx.xxx.xxx/ | changed | WorkRequests |  |

## WR-8: Server informs Client of modification of an existing Work Request (Deletion of an attribute)

In this test case, the Server informs the Client of the deletion of an extension from the phone number of the Organization to which a Work Request has been assigned. This is an asynchronous notification using an Event Stereotype message. There is no response message.

***IMPORTANT: Because the intent is to remove an existing element (phone extension), it is necessary to leverage the OperationSet technique. Please refer to the subsection entitled 61968 Part 100 Considerations in Section 2 and Annex D for a more complete discussion concerning the use of OperationSets to accomplish the deletion of attributes and/or association classes. A phone extension is an example of an attribute.***

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, Work Request WR-24256 was previously created earlier in the day with a phone extension of 22 for the DSOP4 Organization.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Work Request with a Names.name identifier of WR-24256 and a phone extension of 22 for the DSOP4 Organization, as created in test case WR-6, is assumed to exist. |
| **Post Condition(s):** | The Client is informed that the subject Work Request has been modified to delete the phone extension. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

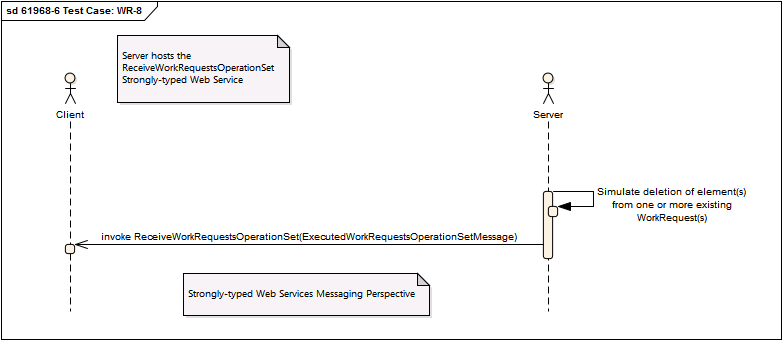


Figure ‑ Sequence Diagram for Test Case WR-8

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveWorkRequestsOperationSet.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsOperationSetMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ExecutedWorkRequestsOperationSet | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:ExecutedWorkRequestsOperationSet xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsOperationSetMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsOperationSetMessage WorkRequestsOperationSetMessage.xsd">

<tns:Header>

<Verb>executed</Verb>

<Noun>OperationSet</Noun>

<Timestamp>2015-07-06T21:20:47-06:00</Timestamp>

<MessageID>a9c42e33-2e16-40a5-8472-ef420f942098</MessageID>

</tns:Header>

<tns:Payload>

<tns:OperationSet>

<Operation>

<operationId>1</operationId>

<noun>WorkRequests</noun>

<verb>deleted</verb>

<elementOperation>true</elementOperation>

<WorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequests# WorkRequests.xsd">

<WorkRequest>

<Names>

<name>WR-24256</name>

</Names>

<Organisation>

<Names>

<name>DSOP4</name>

</Names>

<phone1>

<extension>22</extension>

</phone1>

</Organisation>

</WorkRequest>

</WorkRequests>

</Operation>

</tns:OperationSet>

</tns:Payload>

</tns:ExecutedWorkRequestsOperationSet>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Deleted Details from existing Work Request Notification | http://xx.xxx.xxx.xxx/ | executed | OperationSet\* |  |

\*The OperationSet includes a single Operation having:

* verb = "deleted"
* noun = "WorkRequests"
* elementOperation = "true"

## WR-9: Server informs Client of the deletion of an existing Work Request

In this test case, the Server informs the Client of the deletion of an existing Work Request. This is an asynchronous notification using an Event Stereotype message. There is no response message.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, Work Request WR-24255, which was previously created earlier in the day, is deleted.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Work Request with a Names.name identifier of WR-24255, as created in test case WR-6, is assumed to exist. |
| **Post Condition(s):** | The Client is informed that the subject Work Request has been deleted. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

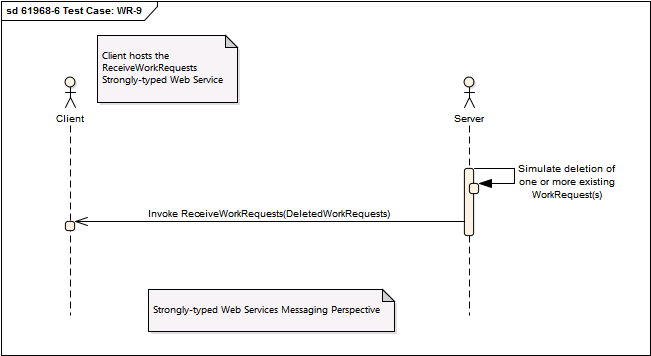


Figure ‑ Sequence Diagram for Test Case WR-9

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveWorkRequests.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Work Requests.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | WorkRequestsMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | DeletedWorkRequests | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 (x64) (http://www.altova.com)-->

<tns:DeletedWorkRequests xmlns="http://iec.ch/TC57/2015/WorkRequests#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/WorkRequestsMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/WorkRequestsMessage WorkRequestsMessage.xsd">

<tns:Header>

<msg:Verb>deleted</msg:Verb>

<msg:Noun>WorkRequests</msg:Noun>

<msg:Timestamp>2015-07-06T22:01:19-06:00</msg:Timestamp>

<msg:MessageID>755dd3dc-3cd8-415f-a2a7-2e9e912ac5e3</msg:MessageID>

</tns:Header>

<tns:Payload>

<WorkRequests>

<WorkRequest>

<Names>

<name>WR-24255</name>

</Names>

</WorkRequest>

</WorkRequests>

</tns:Payload>

</tns:DeletedWorkRequests>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Deleted Details from existing Work Request Notification | http://xx.xxx.xxx.xxx/ | deleted | WorkRequests |  |

# Maintenance Order Test Cases

## MO-1a: Client requests creation of a Maintenance Order and Server replies (Success - Single Maintenance Order)

In this test case, the Client requests the Server to instantiate a single Maintenance Order. The Server returns a response message indicating success with no errors.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the Maintenance Order would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "create" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

Also as noted, this test case illustrates the successful creation of a single Maintenance Order. Subsequent test cases will illustrate attempts to create multiple Maintenance Orders via a single request message as well as responses indicating various failures as well as successes.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | A new Maintenance Order is created with the mRID and Names identifier(s) that were passed in the request message. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

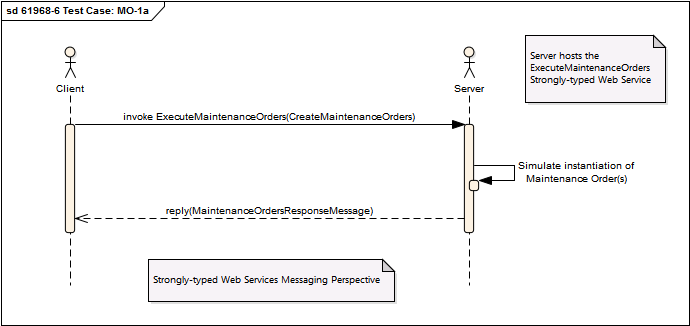


Figure ‑ Sequence Diagram for Test Case MO-1a

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateMaintenanceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreateMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-27T14:35:04-06:00</msg:Timestamp>

<msg:MessageID>b98a0172-6658-4aed-b13b-e4ac9d33b985</msg:MessageID>

<msg:CorrelationID>8583c8d6-a9fb-4708-88ab-341186f04437</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<mRID>8687d5d9-d972-4aec-990e-ea3c01175e42</mRID>

<Names>

<name>MO-21897</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>09aff76b-20c0-4ea0-b259-1990f0172dc3</mRID>

<Names>

<name>MNT04</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>201</extension>

<localNumber>5655</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>446 Main St, Palo, IA 52324</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Main</name>

<number>446</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>2404b40d-a8d6-4eed-9f52-74b7a464eb28</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-27T14:35:03-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-27T14:35:03-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-27T14:35:03-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-29T17:00:00-06:00</end>

<start>2015-07-29T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>db63f900-b36f-40f1-9614-105ae5a48fef</mRID>

<Hazards>

<type>High Voltage</type>

</Hazards>

<mainAddress>

<streetDetail>

<addressGeneral>14455 Blairsferry Rd, Palo, IA 52324</addressGeneral>

<name>Blairsferry</name>

<number>14445</number>

<type>Rd</type>

<withinTownLimits>false</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>5e61408b-fa2a-4692-8cdc-623e6bc65d53</mRID>

<instruction>Exchange cover on equipment panel</instruction>

<statusKind>scheduled</statusKind>

<subject>Replace cover</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>ddc0e9cd-29db-4ea8-b0de-002a73028a0c</mRID>

<critical>false</critical>

<Location>

<mRID>790fd69b-c9b8-4fcd-a19b-0a357587e8ad</mRID>

<direction>S</direction>

<Hazards>

<type>High Voltage</type>

</Hazards>

<InternalLocation>

<BuildingName>Shed</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>14455 Blairsferry Rd, Palo, IA 52324</addressGeneral>

<name>Blairsferry</name>

<number>14445</number>

<type>Rd</type>

<withinTownLimits>false</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</Location>

</Assets>

<Crews>

<CrewMembers>

<Person>

<firstName>Eric</firstName>

<lastName>Norton</lastName>

</Person>

</CrewMembers>

<Names>

<name>Norton, Eric</name>

</Names>

</Crews>

<MaterialItems>

<Names>

<name>XC-4459848-CH</name>

<NameType>

<description>Panel Cover</description>

<name>Part Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<quantity>

<multiplier>none</multiplier>

<unit>count</unit>

<value>1</value>

</quantity>

</MaterialItems>

</WorkTasks>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:CreateMaintenanceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | MaintenanceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | MaintenanceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:MaintenanceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-27T14:35:06-06:00</msg:Timestamp>

<msg:MessageID>9579940b-c8c6-4349-8ec7-abdc6cff6848</msg:MessageID>

<msg:CorrelationID>8583c8d6-a9fb-4708-88ab-341186f04437</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:MaintenanceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Maintenance Order | http://xx.xxx.xxx.xxx/ | create | MaintenanceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | MaintenanceOrders |  |

## MO-1b: Client requests creation of a Maintenance Order and Server replies (Failure - Single Maintenance Order)

In this test case, the Client requests the Server to instantiate a single Maintenance Order; however the ID of the Maintenance Order is the same as in Test Case MO-1a. Consquently, the Server returns a response message indicating a failure based on a business rule prohibiting duplicate Maintanence Orders.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

Also as noted, this test case illustrates a failure of a request to create a single Maintenance Order. Subsequent test cases will illustrate attempts to create multiple Maintenance Orders via a single request message as well as responses indicating various failures as well as successes.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | Creation of the Maintenance Order failed as indicated in the Step 2 response message. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

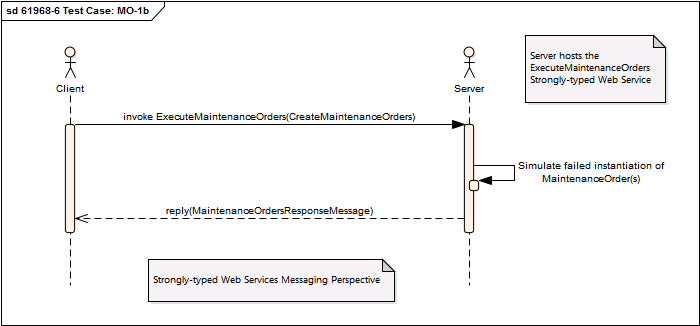


Figure ‑ Sequence Diagram for Test Case MO-1b

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateMaintenanceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreateMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-27T16:35:04-06:00</msg:Timestamp>

<msg:MessageID>28565fb1-1e42-4b39-8420-12d4086ee950</msg:MessageID>

<msg:CorrelationID>617d4293-00ca-4f65-86a9-1134ed6ee276</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<mRID>8687d5d9-d972-4aec-990e-ea3c01175e42</mRID>

<Names>

<name>MO-21897</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>09aff76b-20c0-4ea0-b259-1990f0172dc3</mRID>

<Names>

<name>MNT04</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>201</extension>

<localNumber>5655</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>446 Main St, Palo, IA 52324</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Main</name>

<number>446</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>2404b40d-a8d6-4eed-9f52-74b7a464eb28</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-27T16:35:03-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-27T16:35:03-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-27T16:35:03-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-29T17:00:00-06:00</end>

<start>2015-07-29T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>db63f900-b36f-40f1-9614-105ae5a48fef</mRID>

<Hazards>

<type>High Voltage</type>

</Hazards>

<mainAddress>

<streetDetail>

<addressGeneral>14455 Blairsferry Rd, Palo, IA 52324</addressGeneral>

<name>Blairsferry</name>

<number>14445</number>

<type>Rd</type>

<withinTownLimits>false</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>5e61408b-fa2a-4692-8cdc-623e6bc65d53</mRID>

<instruction>Exchange cover on equipment panel</instruction>

<statusKind>scheduled</statusKind>

<subject>Replace cover</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>ddc0e9cd-29db-4ea8-b0de-002a73028a0c</mRID>

<critical>false</critical>

<Location>

<mRID>790fd69b-c9b8-4fcd-a19b-0a357587e8ad</mRID>

<direction>S</direction>

<Hazards>

<type>High Voltage</type>

</Hazards>

<InternalLocation>

<BuildingName>Shed</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>14455 Blairsferry Rd, Palo, IA 52324</addressGeneral>

<name>Blairsferry</name>

<number>14445</number>

<type>Rd</type>

<withinTownLimits>false</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</Location>

</Assets>

<Crews>

<CrewMembers>

<Person>

<firstName>Eric</firstName>

<lastName>Norton</lastName>

</Person>

</CrewMembers>

<Names>

<name>Norton, Eric</name>

</Names>

</Crews>

<MaterialItems>

<Names>

<name>XC-4459848-CH</name>

<NameType>

<description>Panel Cover</description>

<name>Part Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<quantity>

<multiplier>none</multiplier>

<unit>count</unit>

<value>1</value>

</quantity>

</MaterialItems>

</WorkTasks>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:CreateMaintenanceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | MaintenanceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | MaintenanceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:MaintenanceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-27T16:35:05-06:00</msg:Timestamp>

<msg:MessageID>a88f485c-2657-48ba-a3af-926f64f40286</msg:MessageID>

<msg:CorrelationID>617d4293-00ca-4f65-86a9-1134ed6ee276</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>FAILED</msg:Result>

<msg:Error>

<msg:code>6.1</msg:code>

<msg:level>FATAL</msg:level>

<msg:details>Request cancelled per business rule</msg:details>

<msg:ID idType="Maintenance Order Number" idAuthority="Utility XYZ" kind="name" objectType="MaintenanceOrder">MO-21897</msg:ID>

</msg:Error>

</tns:Reply>

</tns:MaintenanceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Maintenance Order | http://xx.xxx.xxx.xxx/ | create | MaintenanceOrders |  |
| 2 | Failure Response | http://xx.xxx.xxx.xxx/ | reply | MaintenanceOrders |  |

## MO-1c: Client requests creation of two Maintenance Orders and Server replies (Success - Two Maintenance Orders in a single message)

In this test case, the Client requests the Server to instantiate two Maintenance Orders. The Server returns a response message indicating success with no errors.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the Maintenance Orders would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "create" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | Two new Maintenance Orders are created with the Names identifiers that were passed in the request message. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

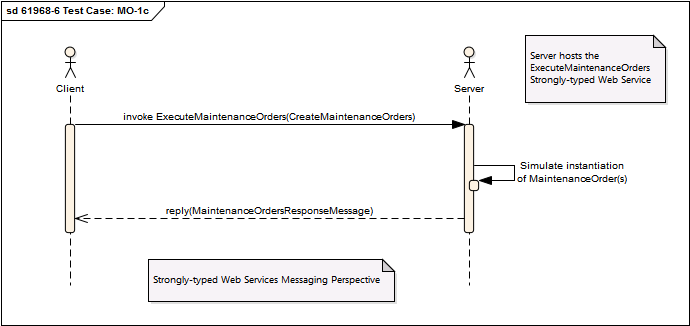


Figure ‑ Sequence Diagram for Test Case MO-1c

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateMaintenanceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreateMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-27T16:53:04-06:00</msg:Timestamp>

<msg:MessageID>6bca9967-f99f-4316-9d8d-d28d06deb4f3</msg:MessageID>

<msg:CorrelationID>0f8991e8-e6c8-47de-b082-bef7782e4c39</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<mRID>ed38a3c4-5f09-41eb-a23e-3bd7407fca57</mRID>

<Names>

<name>MO-86653</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>09aff76b-20c0-4ea0-b259-1990f0172dc3</mRID>

<Names>

<name>MNT04</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>201</extension>

<localNumber>5655</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>446 Main St, Palo, IA 52324</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Main</name>

<number>446</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>74a92bc2-00ab-4def-8568-36e53e523b26</mRID>

<kind>test</kind>

<lastModifiedDateTime>2015-07-27T16:53:03-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-27T16:53:03-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-27T16:53:03-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-30T17:00:00-06:00</end>

<start>2015-07-30T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>0cc91741-b3ea-405b-be13-20c2ceea72c7</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>2201 Gordon Rd, Palo, IA 52324</addressGeneral>

<name>Gordon</name>

<number>2201</number>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>4c8c9a14-af79-42df-9fb6-fe257ee15c9f</mRID>

<instruction>Perform test</instruction>

<statusKind>scheduled</statusKind>

<subject>Routine test</subject>

<taskKind>investigate</taskKind>

<Assets>

<mRID>77676d48-1658-465f-8a6f-9027cb936d17</mRID>

<critical>true</critical>

<Location>

<mRID>790fd69b-c9b8-4fcd-a19b-0a357587e8ad</mRID>

<direction>SW</direction>

<Hazards>

<type>High Voltage</type>

</Hazards>

<InternalLocation>

<BuildingName>NW Sub</BuildingName>

<BuildingNumber>0</BuildingNumber>

<Floor>0</Floor>

<RoomNumber>0</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2201 Gordon Rd, Palo, IA 52324</addressGeneral>

<name>Gordon</name>

<number>2201</number>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</Location>

</Assets>

<Crews>

<CrewMembers>

<Person>

<firstName>Colton</firstName>

<lastName>Buchanan</lastName>

</Person>

</CrewMembers>

<Names>

<name>Buchanan, Colton</name>

</Names>

</Crews>

</WorkTasks>

</Work>

</MaintenanceOrder>

<MaintenanceOrder>

<mRID>b2c13378-35d3-4110-8247-91a44bdac90c</mRID>

<Names>

<name>MO-86654</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>09aff76b-20c0-4ea0-b259-1990f0172dc3</mRID>

<Names>

<name>MNT04</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>201</extension>

<localNumber>5655</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>446 Main St, Palo, IA 52324</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Main</name>

<number>446</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>448dcfc9-1330-4d0e-9d3a-62d10205c5d1</mRID>

<kind>test</kind>

<lastModifiedDateTime>2015-07-27T16:53:03-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-27T16:53:03-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-27T16:53:03-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-30T17:00:00-06:00</end>

<start>2015-07-30T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>0cc91741-b3ea-405b-be13-20c2ceea72c7</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>2201 Gordon Rd, Palo, IA 52324</addressGeneral>

<name>Gordon</name>

<number>2201</number>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>4ac615ef-1a39-4980-82e0-ccd18417ca10</mRID>

<instruction>Perform test</instruction>

<statusKind>scheduled</statusKind>

<subject>Routine test</subject>

<taskKind>investigate</taskKind>

<Assets>

<mRID>746e96c8-bca2-417b-89b4-b48957d4fabf</mRID>

<critical>true</critical>

<Location>

<mRID>790fd69b-c9b8-4fcd-a19b-0a357587e8ad</mRID>

<direction>SW</direction>

<Hazards>

<type>High Voltage</type>

</Hazards>

<InternalLocation>

<BuildingName>NW Sub</BuildingName>

<BuildingNumber>0</BuildingNumber>

<Floor>0</Floor>

<RoomNumber>0</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2201 Gordon Rd, Palo, IA 52324</addressGeneral>

<name>Gordon</name>

<number>2201</number>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</Location>

</Assets>

<Crews>

<CrewMembers>

<Person>

<firstName>Colton</firstName>

<lastName>Buchanan</lastName>

</Person>

</CrewMembers>

<Names>

<name>Buchanan, Colton</name>

</Names>

</Crews>

</WorkTasks>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:CreateMaintenanceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | MaintenanceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | MaintenanceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:MaintenanceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-27T16:53:07-06:00</msg:Timestamp>

<msg:MessageID>b066e6df-7586-419a-aa16-693f12df0320</msg:MessageID>

<msg:CorrelationID>0f8991e8-e6c8-47de-b082-bef7782e4c39</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:MaintenanceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Maintenance Order | http://xx.xxx.xxx.xxx/ | create | MaintenanceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | MaintenanceOrders |  |

## MO-1d: Client requests creation of two Maintenance Orders and Server replies (Two Maintenance Orders in a single message - One succeeds and one fails)

In this test case, the Client requests the Server to instantiate two Maintenance Orders. The Server returns a response message indicating that instantiation of the second Maintenance Order failed. Since no error is reported for the first Maintenance Order, the interpretation of the response message is that the instantiation of the first Maintenance Order succeeded.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the first of the two Maintenance Orders would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "create" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | One new Maintenance Order is created with the Names identifier that was passed in the request message. An error is returned indicating that instantiation of the second Maintenance Order failed. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

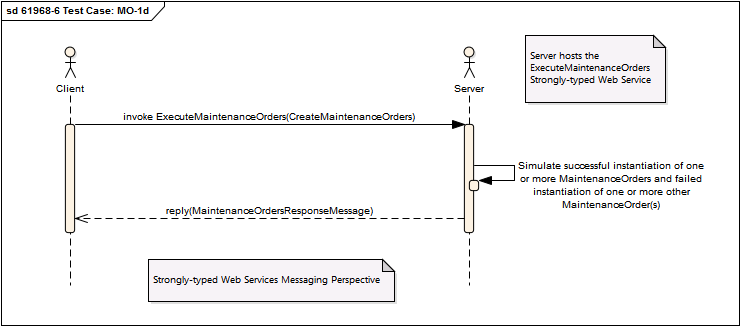


Figure ‑ Sequence Diagram for Test Case MO-1d

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateMaintenanceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreateMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-27T17:17:44-06:00</msg:Timestamp>

<msg:MessageID>25cf66ad-b5bd-409a-8709-231a6527d4d4</msg:MessageID>

<msg:CorrelationID>b4efacd7-31dc-4807-8f0f-24e38b491c25</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<mRID>cb89d96d-f858-4188-b64d-6bddad2d9af5</mRID>

<Names>

<name>MO-65888</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>0043dbbe-57fd-4979-9336-82ef3ff5ea4a</mRID>

<Names>

<name>MNT07</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>74</extension>

<localNumber>8124</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>223 Commerce St, Fairfax, IA 52228</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Commerce</name>

<number>223</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52228</code>

<country>USA</country>

<name>Fairfax</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>b4229828-612c-4c12-be9d-338572b0268f</mRID>

<kind>maintenance</kind>

<lastModifiedDateTime>2015-07-27T17:17:42-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-27T17:17:42-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-27T17:17:42-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T16:00:00-06:00</end>

<start>2015-08-01T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkTasks>

<mRID>4c8c9a14-af79-42df-9fb6-fe257ee15c9f</mRID>

<instruction>Perform test</instruction>

<statusKind>scheduled</statusKind>

<subject>Routine test</subject>

<taskKind>investigate</taskKind>

<Assets>

<critical>true</critical>

<Location>

<mRID>328b186a-fb46-45e0-b796-d15b78e64c71</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>1554 Lilly Dr, Fairfax, IA 52228</addressGeneral>

<name>Lilly</name>

<number>1554</number>

<type>Dr</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52228</code>

<country>USA</country>

<name>Fairfax</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</Location>

<Names>

<name>BR-144673</name>

<NameType>

<name>Breaker ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Assets>

<Crews>

<CrewMembers>

<Person>

<firstName>Margaret</firstName>

<lastName>Pickard</lastName>

</Person>

</CrewMembers>

<Names>

<name>Pickard, Margaret</name>

</Names>

</Crews>

</WorkTasks>

</Work>

</MaintenanceOrder>

<MaintenanceOrder>

<mRID>8f415637-d4ce-4f7c-9489-5a054d6394f6</mRID>

<Names>

<name>MO-65889</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>0043dbbe-57fd-4979-9336-82ef3ff5ea4a</mRID>

<Names>

<name>MNT07</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>74</extension>

<localNumber>8124</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>223 Commerce St, Fairfax, IA 52228</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Commerce</name>

<number>223</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52228</code>

<country>USA</country>

<name>Fairfax</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>31ef8f68-841c-4632-9286-163eff5717ce</mRID>

<kind>maintenance</kind>

<lastModifiedDateTime>2015-07-27T17:17:42-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-27T17:17:42-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-27T17:17:42-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T16:00:00-06:00</end>

<start>2015-08-01T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkTasks>

<mRID>250f234a-681b-4bb3-9605-560e14bc067c</mRID>

<instruction>Perform test</instruction>

<statusKind>scheduled</statusKind>

<subject>Routine test</subject>

<taskKind>investigate</taskKind>

<Assets>

<critical>true</critical>

<Location>

<mRID>328b186a-fb46-45e0-b796-d15b78e64c71</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>1554 Lilly Dr, Fairfax, IA 52228</addressGeneral>

<name>Lilly</name>

<number>1554</number>

<type>Dr</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52228</code>

<country>USA</country>

<name>Fairfax</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</Location>

<Names>

<name>BR-9773877</name>

<NameType>

<name>Breaker ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Assets>

<Crews>

<CrewMembers>

<Person>

<firstName>Margaret</firstName>

<lastName>Pickard</lastName>

</Person>

</CrewMembers>

<Names>

<name>Pickard, Margaret</name>

</Names>

</Crews>

</WorkTasks>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:CreateMaintenanceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | MaintenanceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | MaintenanceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:MaintenanceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-27T17:17:47-06:00</msg:Timestamp>

<msg:MessageID>10ece46c-26c1-4210-ae0f-cf4e129aec7a</msg:MessageID>

<msg:CorrelationID>b4efacd7-31dc-4807-8f0f-24e38b491c25</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>FAILED</msg:Result>

<msg:Error>

<msg:code>6.1</msg:code>

<msg:level>FATAL</msg:level>

<msg:details>Request cancelled per business rule</msg:details>

<msg:ID idType="Maintenance Order Number" idAuthority="Utility XYZ" kind="name" objectType="MaintenanceOrder">MO-65889</msg:ID>

</msg:Error>

</tns:Reply>

</tns:MaintenanceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Maintenance Order | http://xx.xxx.xxx.xxx/ | create | MaintenanceOrders |  |
| 2 | Mixed Success / Failure Response | http://xx.xxx.xxx.xxx/ | reply | MaintenanceOrders |  |

## MO-2a: Client requests modification of an existing Maintenance Order and Server replies (Success - Change schedule)

In this test case, the Client requests the Server to modify an existing Maintenance Order by changing the schedule. The Server returns a response message indicating success with no errors.

*Note that to change only the schedule, providing an updated start time and an updated end time, the only required content in the payload is the identifiers of the MaintenanceOrder and Work (item) plus the new start and end times.*

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Maintenance Order with a Names.name identifier of MO-21897, as created in test case MO-1a, is assumed to exist. |
| **Post Condition(s):** | The subject Maintenance Order is modified to have a new schedule. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

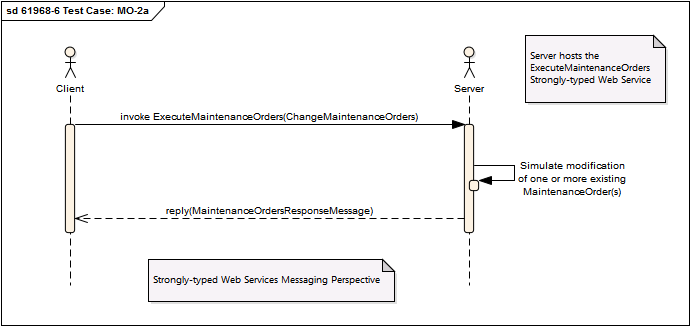


Figure ‑Sequence Diagram for Test Case MO-2a

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ChangeMaintenanceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ChangeMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>change</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T10:44:44-06:00</msg:Timestamp>

<msg:MessageID>1c255a18-f05b-4e41-9ab4-b90a271a4b21</msg:MessageID>

<msg:CorrelationID>4e2a46ca-7a34-4d51-8d0e-d9452a28e23b</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<Names>

<name>MO-21897</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>2404b40d-a8d6-4eed-9f52-74b7a464eb28</mRID>

<TimeSchedules>

<scheduleInterval>

<end>2015-07-31T17:00:00-06:00</end>

<start>2015-07-31T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:ChangeMaintenanceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | MaintenanceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | MaintenanceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:MaintenanceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>MaintenanceOrdes</msg:Noun>

<msg:Timestamp>2015-07-28T10:44:47-06:00</msg:Timestamp>

<msg:MessageID>4d09e642-44aa-4002-9018-e6a43bd58cff</msg:MessageID>

<msg:CorrelationID>4e2a46ca-7a34-4d51-8d0e-d9452a28e23b</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:MaintenanceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Change Maintenance Order | http://xx.xxx.xxx.xxx/ | change | MaintenanceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | MaintenanceOrders |  |

## MO-2b: Client requests modification of an existing Maintenance Order and Server replies (Success - Add a second Crew)

In this test case, the Client requests the Server to modify an existing Maintenance Order by adding a additional Crew to the Work (item) in the Maintenance Order. The Server returns a response message indicating success with no errors.

*Note that to add a crew, the only required content in the payload is the identifiers of the MaintenanceOrder and Work (item) plus the identifiers and (if applicable) details for the new crew.*

*(Note also that if the intent had been to remove the existing crew and substitute a new crew, it would be necessary to leverage the OperationSet technique illustrated in test case MO-3 in order to remove the existing crew. A second transaction, similar to the one illustrated in this test case, could then be performed to add the new crew. If desired, the two operations (deleting one crew and adding anothe crew, could be combined in one request message using an OperationSet with two operations.)*

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Maintenance Order with an mRID identifier of ed38a3c4-5f09-41eb-a23e-3bd7407fca57, as created in test case MO-1c, is assumed to exist. |
| **Post Condition(s):** | The subject Maintenance Order is modified to have a second crew. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

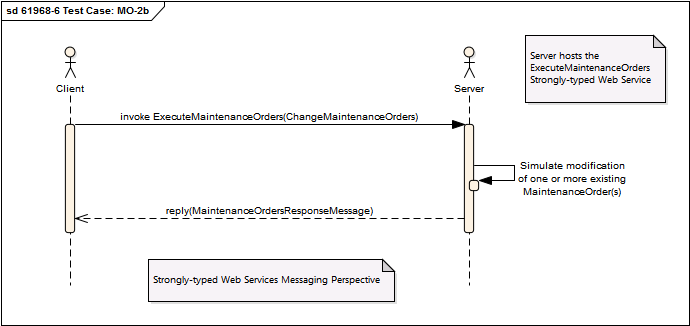


Figure ‑ Sequence Diagram for Test Case MO-2b

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ChangeMaintenanceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ChangeMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>change</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T11:37:16-06:00</msg:Timestamp>

<msg:MessageID>804606de-c0e4-4d05-815e-2e968f2910dc</msg:MessageID>

<msg:CorrelationID>3b9da3b8-9770-4d3a-8b8c-fd9734811b1f</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<mRID>ed38a3c4-5f09-41eb-a23e-3bd7407fca57</mRID>

<Work>

<mRID>74a92bc2-00ab-4def-8568-36e53e523b26</mRID>

<WorkTasks>

<mRID>4c8c9a14-af79-42df-9fb6-fe257ee15c9f</mRID>

<Crews>

<Names>

<name>Fritz, Thomas </name>

</Names>

</Crews>

</WorkTasks>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:ChangeMaintenanceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | MaintenanceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | MaintenanceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:MaintenanceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T11:37:18-06:00</msg:Timestamp>

<msg:MessageID>264a1dc7-ea9e-43dd-b80d-b3c5d165e72e</msg:MessageID>

<msg:CorrelationID>3b9da3b8-9770-4d3a-8b8c-fd9734811b1f</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:MaintenanceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Change Maintenance Order | http://xx.xxx.xxx.xxx/ | change | MaintenanceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | MaintenanceOrders |  |

## MO-3: Client requests modification of an existing Maintenance Order and Server replies (Success - Delete a Crew)

In this test case, the Client requests the Server to modify an existing Maintenance Order by deleting one of the two Crews assigned to the Work (item) in the Maintenance Order. The Server returns a response message indicating success with no errors.

***IMPORTANT: Because the intent is to remove an existing crew, it is necessary to leverage the OperationSet technique. Please refer to the subsection entitled 61968 Part 100 Considerations in Section 2 and Annex D for a more complete discussion concerning the use of OperationSets to accomplish the deletion of attributes and/or association classes. A crew assignment is an example of an association class - in the UML a Crew is a separate CIM object that is associated with a Work (item) in a MaintenanceOrder. Attributes, in contrast, are just that - they appear in the UML as an attribute of a CIM Class (sometimes inherited from a parent class).***

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, MaintenanceOrder MO-86653 already exists and has two crews, with Names.name identifiers of "Buchanan, Colton" and "Fritz, Thomas" assigned. This test case will delete the assignment of "Buchanan, Colton ".

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Maintenance Order with a Work (item) having 2 assigned crews and a MaintenanceOrder Names.name identifier of MO-86653, as created in test case MO-1c and modified in test case MO-2b, is assumed to exist. |
| **Post Condition(s):** | The subject Maintenance Order is modified to have crew "Buchanan, Colton" removed. This leaves the Maintenance Order having a single assigned Crew of "Fritz, Thomas". |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

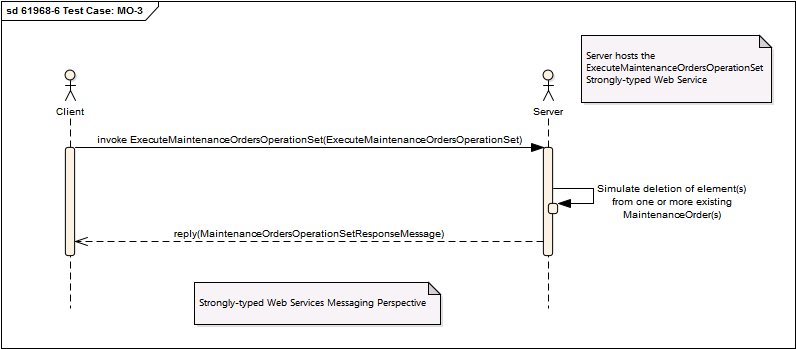


Figure ‑ Sequence Diagram for Test Case MO-3

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrdersOperationSet.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersOperationSetMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ExecuteMaintenanceOrdersOperationSet | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ExecuteMaintenanceOrdersOperationSet xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersOperationSetMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersOperationSetMessage MaintenanceOrdersOperationSetMessage.xsd">

<tns:Header>

<Verb>execute</Verb>

<Noun>OperationSet</Noun>

<Timestamp>2015-07-28T12:33:55-06:00</Timestamp>

<MessageID>71b00e74-a8af-48a0-9c99-0ba69d3401b9</MessageID>

<CorrelationID>8f50d4ab-e9e3-44c4-89b8-7cc3a094dc1e</CorrelationID>

</tns:Header>

<tns:Payload>

<tns:OperationSet>

<Operation>

<operationId>1</operationId>

<noun>MaintenanceOrders</noun>

<verb>delete</verb>

<elementOperation>true</elementOperation>

<MaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrders# MaintenanceOrders.xsd">

<MaintenanceOrder>

<Names>

<name>MO-86653</name>

</Names>

<Work>

<mRID>74a92bc2-00ab-4def-8568-36e53e523b26</mRID>

<WorkTasks>

<mRID>4c8c9a14-af79-42df-9fb6-fe257ee15c9f</mRID>

<Crews>

<Names>

<name>Buchanan, Colton</name>

</Names>

</Crews>

</WorkTasks>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</Operation>

</tns:OperationSet>

</tns:Payload>

</tns:ExecuteMaintenanceOrdersOperationSet>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrdersOperationSet.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | MaintenanceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersOperationSetMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | MaintenanceOrdersOperationSetResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:MaintenanceOrdersOperationSetResponseMessage xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersOperationSetMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersOperationSetMessage MaintenanceOrdersOperationSetMessage.xsd">

<tns:Header>

<Verb>reply</Verb>

<Noun>OperationSet</Noun>

<Timestamp>2015-07-02T12:50:15-06:00</Timestamp>

<MessageID>3bd179ac-86d8-4f64-99bd-afc07b652df7</MessageID>

<CorrelationID>e5961833-4caa-4586-b281-7e644cd818c0</CorrelationID>

</tns:Header>

<tns:Reply>

<Result>OK</Result>

<Error>

<code>0.0</code>

<operationId>1</operationId>

</Error>

<operationId>1</operationId>

</tns:Reply>

</tns:MaintenanceOrdersOperationSetResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Delete Details from existing Maintenance Order | http://xx.xxx.xxx.xxx/ | execute | OperationSet\* |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | OperationSet\* |  |

\*The OperationSet includes a single Operation having:

* verb = "delete"
* noun = "MaintenanceOrders"
* elementOperation = "true"

## MO-4: Client requests deletion of an existing Maintenance Order and Server replies (Success)

In this test case, the Client requests the Server to delete an existing Maintenance Order (in its entirety). The Server returns a response message indicating success with no errors.

It is noted that in practice, MaintenanceOrders would seldom be deleted; instead they would more likely be closed or cancelled. Nevertheless, this use case is included for completeness and to distinguish the deletion of a Maintenance Order in its entirety from the deletion of attributes or associated classes from an existing Maintenance Order (as illustrated in test case MO-3).

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, MaintenanceOrder MO-21897, which was previously created in test case MO-1a, will be deleted. However, for illustrative purposes, this deletion will be processed by referencing the mRID of the existing MaintenanceOrder ("8687d5d9-d972-4aec-990e-ea3c01175e42", as assigned when it was created in test case MO-1a) rather than its Names.name identifier of MO-21897.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Maintenance Order with a Names.name identifier of MO-21897 and mRID of 8687d5d9-d972-4aec-990e-ea3c01175e42, as created in test case MO-1a, is assumed to exist. |
| **Post Condition(s):** | The subject Maintenance Order is deleted. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

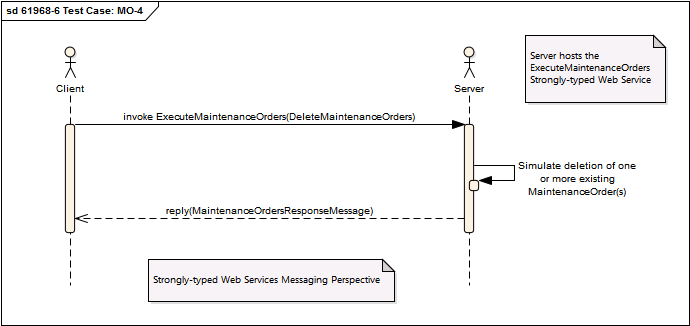


Figure ‑ Sequence Diagram for Test Case MO-4

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | DeleteMaintenanceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:DeleteMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>delete</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T13:46:25-06:00</msg:Timestamp>

<msg:MessageID>f3043298-68f7-4c1f-8457-d2470a1f5e07</msg:MessageID>

<msg:CorrelationID>2076009d-da37-4c9e-8f64-1065618adec5</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<mRID>8687d5d9-d972-4aec-990e-ea3c01175e42</mRID>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:DeleteMaintenanceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteMaintenanceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | MaintenanceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | MaintenanceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:MaintenanceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T13:47:25-06:00</msg:Timestamp>

<msg:MessageID>e778042a-cdbd-4945-9dcd-e0fc85f6e193</msg:MessageID>

<msg:CorrelationID>2076009d-da37-4c9e-8f64-1065618adec5</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:MaintenanceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Delete existing Maintenance Order | http://xx.xxx.xxx.xxx/ | delete | MaintenanceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | MaintenanceOrders |  |

## MO-5a: Client requests retrieval of an existing Maintenance Order and Server replies (Success - Single Maintenance Order)

In this test case, the Client requests the Server to provide the details of a single Maintenance Order identified by its Names.name identifier of MO-86653. This Maintenance Order was previously created in test case MO-1c and modified in test cases MO-2b and MO-3. The Server returns a response message indicating success with no errors and including the details of the current state of the Maintenance Order in the payload section of the response message. In this instance, the Crew assignment in the Maintenance Order reflects the addition of a 2nd Crew (test case MO-2b) and the deletion of the original Crew (test case MO-3).

*Note 1: The parameters for the request query (in this case the Names.name identifier of the Maintenance Order whose details are being requested) are supplied using XML generated using the GetMeterReadings profile. The xml for this request is placed in the Request section of the Message envelope and not in the Payload section of the message envelope.*

*Note 2: Not all response messages will contain a payload; only those for which the query returns one or more Maintenance Orders will have contents in the payload section. In response messages that contain a payload, the payload must validate against the "constrained" version of the MaintenanceOrders.xsd that is used for "create" scenarios and not the "unconstrained" version that is used for "change or delete" scenarios.*

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Applications Being Tested may contain any of the request and payload elements and attributes permitted by the XSDs found in Annex G and F respectively.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Maintenance Order with a Names.name identifier of MO-86653, as created in test case MO-1c, is assumed to exist. |
| **Post Condition(s):** | The full content of the subject Maintenance Order is returned in response to the query. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

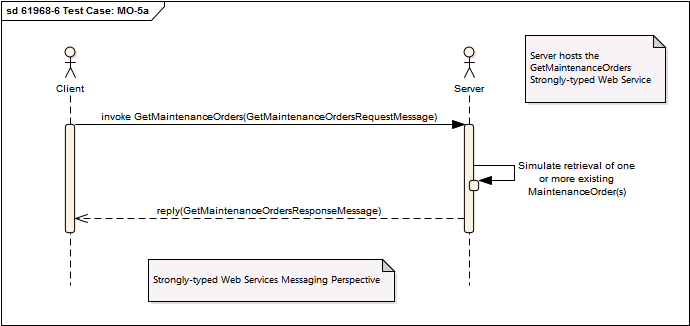


Figure ‑ Sequence Diagram for Test Case MO-5a

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | GetMaintenanceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'} |
| **Part 6 XSD** | GetMaintenance Orders.xsd  MaintenanceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'get' Profiles}  {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | GetMaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd} |
| **Message Stereotype** | GetMaintenanceOrdersRequestMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:GetMaintenanceOrdersRequestMessage xmlns="http://iec.ch/TC57/2015/GetMaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/GetMaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/GetMaintenanceOrdersMessage GetMaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>get</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T13:58:41-06:00</msg:Timestamp>

<msg:MessageID>fd3b1a88-23aa-4c56-95a0-feff7db9c02e</msg:MessageID>

<msg:CorrelationID>4347a9b4-256b-426e-9d66-26f684061a47</msg:CorrelationID>

</tns:Header>

<tns:Request>

<GetMaintenanceOrders>

<MaintenanceOrder>

<Names>

<name>MO-86653</name>

</Names>

</MaintenanceOrder>

</GetMaintenanceOrders>

</tns:Request>

</tns:GetMaintenanceOrdersRequestMessage>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |  |
| --- | --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** | |
| **WSDL** | GetMaintenanceOrders.wsdl | | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'} |
| **Part 6 XSD** | MaintenanceOrders.xsd | | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | GetMaintenanceOrdersMessage.xsd | | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd} |
| **Message Stereotype** | GetMaintenanceOrdersResponseMessage | | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:GetMaintenanceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/GetMaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/GetMaintenanceOrdersMessage GetMaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T13:58:44-06:00</msg:Timestamp>

<msg:MessageID>01c20b4b-31fc-40ad-80a5-eea402add7f4</msg:MessageID>

<msg:CorrelationID>4347a9b4-256b-426e-9d66-26f684061a47</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<mRID>ed38a3c4-5f09-41eb-a23e-3bd7407fca57</mRID>

<Names>

<name>MO-86653</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>09aff76b-20c0-4ea0-b259-1990f0172dc3</mRID>

<Names>

<name>MNT04</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>201</extension>

<localNumber>5655</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>446 Main St, Palo, IA 52324</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Main</name>

<number>446</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>74a92bc2-00ab-4def-8568-36e53e523b26</mRID>

<kind>test</kind>

<lastModifiedDateTime>2015-07-27T16:53:03-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-27T16:53:03-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-27T16:53:03-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-07-30T17:00:00-06:00</end>

<start>2015-07-30T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>0cc91741-b3ea-405b-be13-20c2ceea72c7</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>2201 Gordon Rd, Palo, IA 52324</addressGeneral>

<name>Gordon</name>

<number>2201</number>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>4c8c9a14-af79-42df-9fb6-fe257ee15c9f</mRID>

<instruction>Perform test</instruction>

<statusKind>scheduled</statusKind>

<subject>Routine test</subject>

<taskKind>investigate</taskKind>

<Assets>

<mRID>77676d48-1658-465f-8a6f-9027cb936d17</mRID>

<critical>true</critical>

<Location>

<mRID>790fd69b-c9b8-4fcd-a19b-0a357587e8ad</mRID>

<direction>SW</direction>

<Hazards>

<type>High Voltage</type>

</Hazards>

<InternalLocation>

<BuildingName>NW Sub</BuildingName>

<BuildingNumber>0</BuildingNumber>

<Floor>0</Floor>

<RoomNumber>0</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2201 Gordon Rd, Palo, IA 52324</addressGeneral>

<name>Gordon</name>

<number>2201</number>

<type>Rd</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52324</code>

<country>USA</country>

<name>Palo</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</Location>

</Assets>

<Crews>

<Names>

<name>Fritz, Thomas</name>

</Names>

</Crews>

</WorkTasks>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:GetMaintenanceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Get Maintenance Orders | http://xx.xxx.xxx.xxx/ | get | MaintenanceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | MaintenanceOrders |  |

## MO-5b: Client requests retrieval of existing Maintenance Orders and Server replies (Success - Two Maintenance Orders in a single message)

In this test case, the Client requests the Server to provide the details of Maintenance Order(s) associated with Organization "MNT07". Only two existing Maintenance Orders currently associated with Organization "MNT07", as created in test case MO-1d. Consequently, this query returns two Maintenance Orders (MO-65888 and MO-65889). The Server returns a response message indicating success with no errors and including the details of the current state of the two Maintenance Orders in the payload section of the response message.

*Note 1: The parameters for the request query (in this case the Names.name identifier of the Organization with which the Maintenance Orders are associated) are supplied using XML generated using the GetMeterReadings profile . The xml for this request is placed in the Request section of the Message envelope and not in the Payload section of the message envelope.*

*Note 2: Not all response messages will contain a payload; only those for which the query returns one or more Maintenance Orders will have contents in the payload section. In response messages that contain a payload, the payload must validate against the "constrained" version of the MaintenanceOrders.xsd that is used for "create" scenarios and not the "unconstrained" version that is used for "change or delete" scenarios.*

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Applications Being Tested may contain any of the request and payload elements and attributes permitted by the XSDs found in Annex G and F respectively.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | Maintenance Orders with Names.name identifiers of MO-65888 and MO-65889, as created in test case MO-1d, are assumed to exist. |
| **Post Condition(s):** | The full contents of the subject Maintenance Orders are returned in response to the query. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

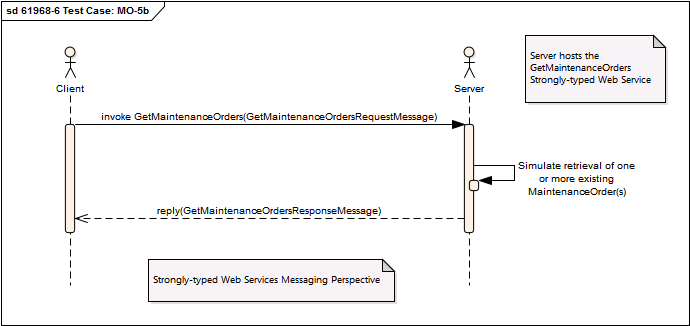


Figure ‑ Sequence Diagram for Test Case MO-5b

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | GetMaintenanceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'} |
| **Part 6 XSD** | GetMaintenance Orders.xsd  MaintenanceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'get' Profiles}  {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | GetMaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd} |
| **Message Stereotype** | GetMaintenanceOrdersRequestMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:GetMaintenanceOrdersRequestMessage xmlns="http://iec.ch/TC57/2015/GetMaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/GetMaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/GetMaintenanceOrdersMessage GetMaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>get</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T15:07:32-06:00</msg:Timestamp>

<msg:MessageID>70967a58-0b9e-4c7f-96e4-c567724c29e0</msg:MessageID>

<msg:CorrelationID>b89c44cc-da84-4a86-a0b3-da7794efe4d5</msg:CorrelationID>

</tns:Header>

<tns:Request>

<GetMaintenanceOrders>

<Organization>

<Names>

<name>MNT07</name>

</Names>

</Organization>

</GetMaintenanceOrders>

</tns:Request>

</tns:GetMaintenanceOrdersRequestMessage>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |  |
| --- | --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** | |
| **WSDL** | GetMaintenanceOrders.wsdl | | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'} |
| **Part 6 XSD** | MaintenanceOrders.xsd | | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | GetMaintenanceOrdersMessage.xsd | | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd} |
| **Message Stereotype** | GetMaintenanceOrdersResponseMessage | | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:GetMaintenanceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/GetMaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/GetMaintenanceOrdersMessage GetMaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T15:07:36-06:00</msg:Timestamp>

<msg:MessageID>52d4e012-90c4-4580-b777-ece3a22e1ac3</msg:MessageID>

<msg:CorrelationID>b89c44cc-da84-4a86-a0b3-da7794efe4d5</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<mRID>cb89d96d-f858-4188-b64d-6bddad2d9af5</mRID>

<Names>

<name>MO-65888</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>0043dbbe-57fd-4979-9336-82ef3ff5ea4a</mRID>

<Names>

<name>MNT07</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>74</extension>

<localNumber>8124</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>223 Commerce St, Fairfax, IA 52228</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Commerce</name>

<number>223</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52228</code>

<country>USA</country>

<name>Fairfax</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>b4229828-612c-4c12-be9d-338572b0268f</mRID>

<kind>maintenance</kind>

<lastModifiedDateTime>2015-07-27T17:17:42-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-27T17:17:42-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-27T17:17:42-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T16:00:00-06:00</end>

<start>2015-08-01T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkTasks>

<mRID>4c8c9a14-af79-42df-9fb6-fe257ee15c9f</mRID>

<instruction>Perform test</instruction>

<statusKind>scheduled</statusKind>

<subject>Routine test</subject>

<taskKind>investigate</taskKind>

<Assets>

<critical>true</critical>

<Location>

<mRID>328b186a-fb46-45e0-b796-d15b78e64c71</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>1554 Lilly Dr, Fairfax, IA 52228</addressGeneral>

<name>Lilly</name>

<number>1554</number>

<type>Dr</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52228</code>

<country>USA</country>

<name>Fairfax</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</Location>

<Names>

<name>BR-144673</name>

<NameType>

<name>Breaker ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Assets>

<Crews>

<CrewMembers>

<Person>

<firstName>Margaret</firstName>

<lastName>Pickard</lastName>

</Person>

</CrewMembers>

<Names>

<name>Pickard, Margaret</name>

</Names>

</Crews>

</WorkTasks>

</Work>

</MaintenanceOrder>

<MaintenanceOrder>

<mRID>8f415637-d4ce-4f7c-9489-5a054d6394f6</mRID>

<Names>

<name>MO-65889</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>0043dbbe-57fd-4979-9336-82ef3ff5ea4a</mRID>

<Names>

<name>MNT07</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>74</extension>

<localNumber>8124</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>223 Commerce St, Fairfax, IA 52228</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Commerce</name>

<number>223</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52228</code>

<country>USA</country>

<name>Fairfax</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>31ef8f68-841c-4632-9286-163eff5717ce</mRID>

<kind>maintenance</kind>

<lastModifiedDateTime>2015-07-27T17:17:42-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-27T17:17:42-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-27T17:17:42-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T16:00:00-06:00</end>

<start>2015-08-01T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkTasks>

<mRID>250f234a-681b-4bb3-9605-560e14bc067c</mRID>

<instruction>Perform test</instruction>

<statusKind>scheduled</statusKind>

<subject>Routine test</subject>

<taskKind>investigate</taskKind>

<Assets>

<critical>true</critical>

<Location>

<mRID>328b186a-fb46-45e0-b796-d15b78e64c71</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>1554 Lilly Dr, Fairfax, IA 52228</addressGeneral>

<name>Lilly</name>

<number>1554</number>

<type>Dr</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52228</code>

<country>USA</country>

<name>Fairfax</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</Location>

<Names>

<name>BR-9773877</name>

<NameType>

<name>Breaker ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Assets>

<Crews>

<CrewMembers>

<Person>

<firstName>Margaret</firstName>

<lastName>Pickard</lastName>

</Person>

</CrewMembers>

<Names>

<name>Pickard, Margaret</name>

</Names>

</Crews>

</WorkTasks>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:GetMaintenanceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Get Maintenance Orders | http://xx.xxx.xxx.xxx/ | change | MaintenanceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | MaintenanceOrders |  |

## MO-6: Server informs Client of the creation of Maintenance Orders (Two Maintenance Orders in a single message)

In this test case, the Server informs the Client of the creation of two Maintenance Orders. Such a notification may occur if the Client is not the original requestor, but instead is being notified of the Maintenance Orders instantiated directly within the Server or as a result of a request by a third system. The notification may occur immediately upon instantiation or at some later date/time. This is an asynchronous notification using an Event Stereotype message. There is no response message.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the Maintenance Orders would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "created" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | It is assumed that Maintenance Orders MO-33344 and MO-33345 were created at different times earlier in the day. |
| **Post Condition(s):** | The Client is informed of the details of two Maintenance Orders created earlier in the day. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

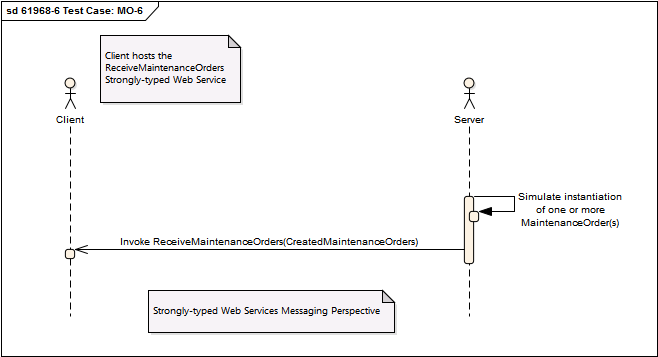


Figure ‑ Sequence Diagram for Test Case MO-6

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveMaintenanceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreatedMaintenanceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreatedMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>created</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T20:30:52-06:00</msg:Timestamp>

<msg:MessageID>20be7958-bc9e-4f67-bd52-67e5df155214</msg:MessageID>

<msg:CorrelationID>a6e768a2-f073-4c86-afda-62e3f4a9d66b</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<mRID>0b6c6584-8d6b-487d-ac62-a0395686a349</mRID>

<Names>

<name>MO-33344</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>76e0a356-d379-4d2b-bc44-ab6f72bfcae0</mRID>

<Names>

<name>MNT08</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>75</extension>

<localNumber>8124</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>223 Commerce St, Fairfax, IA 52228</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Commerce</name>

<number>223</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52228</code>

<country>USA</country>

<name>Fairfax</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>0054c55c-121f-42ff-98f4-04eb6d53220e</mRID>

<kind>construction</kind>

<lastModifiedDateTime>2015-07-28T15:20:50-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-28T15:20:50-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-28T15:20:50-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-31T17:00:00-06:00</end>

<start>2015-08-01T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>f297c2e4-c9d7-40fa-a01c-c8f9835d7a6b</mRID>

<direction>NW</direction>

<CoordinateSystem>

<crsUrn>GPS</crsUrn>

</CoordinateSystem>

<Hazards>

<type>Flooding</type>

</Hazards>

<InternalLocation>

<BuildingName>Pumphouse</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>200</addressGeneral>

<addressGeneral2>Main St</addressGeneral2>

<addressGeneral3>Hiawatha</addressGeneral3>

<buildingName>Pumphouse</buildingName>

<name>Main</name>

<number>200</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52233</code>

<country>USA</country>

<name>Hiawatha</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>11</extension>

<localNumber>2322</localNumber>

</phone1>

<PositionPoints>

<sequenceNumber>1</sequenceNumber>

<xPosition>42.050356</xPosition>

<yPosition>-91.679830</yPosition>

<zPosition>858.0</zPosition>

</PositionPoints>

</WorkLocation>

<WorkTasks>

<mRID>25b854b5-0c09-4805-ac03-3fa3f396c69b</mRID>

<crewETA>2015-08-02T09:30:00-06:00</crewETA>

<instruction>Construct berm around transformer to mitigate flood hazard</instruction>

<statusKind>scheduled</statusKind>

<subject>construct berm</subject>

<taskKind>install</taskKind>

<Assets>

<mRID>79122b2e-d5ec-4344-952a-3a722f565649</mRID>

<critical>true</critical>

<Location>

<mRID>f297c2e4-c9d7-40fa-a01c-c8f9835d7a6b</mRID>

<direction>NW</direction>

<CoordinateSystem>

<crsUrn>GPS</crsUrn>

</CoordinateSystem>

<Hazards>

<type>Flooding</type>

</Hazards>

<InternalLocation>

<BuildingName>Pumphouse</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>200</addressGeneral>

<addressGeneral2>Main St</addressGeneral2>

<addressGeneral3>Hiawatha</addressGeneral3>

<buildingName>Pumphouse</buildingName>

<name>Main</name>

<number>200</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52233</code>

<country>USA</country>

<name>Hiawatha</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>11</extension>

<localNumber>2322</localNumber>

</phone1>

<PositionPoints>

<sequenceNumber>1</sequenceNumber>

<xPosition>42.050356</xPosition>

<yPosition>-91.679830</yPosition>

<zPosition>858.0</zPosition>

</PositionPoints>

</Location>

<Names>

<name>TR-45569873</name>

<NameType>

<name>Transformer ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Procedures>

<instruction>Refer to diagram provided by Engineering Dept</instruction>

<kind>other</kind>

<sequenceNumber>1</sequenceNumber>

</Procedures>

</Assets>

<Crews>

<mRID>79122b2e-d5ec-4344-952a-3a722f565649</mRID>

<CrewMembers>

<Person>

<firstName>Jim</firstName>

<lastName>King</lastName>

</Person>

</CrewMembers>

<CrewMembers>

<Person>

<firstName>Tony</firstName>

<lastName>Adams</lastName>

</Person>

</CrewMembers>

<Names>

<name>Maintenance Team 2</name>

</Names>

<WorkAssets>

<mRID>4be564e5-a3b5-4da5-bbac-689432d9144a</mRID>

<critical>false</critical>

<odometerReadDateTime>2015-07-27T18:12:00-06:00</odometerReadDateTime>

<odometerReading>129455</odometerReading>

<usageKind>crew</usageKind>

<Names>

<name>652113TT</name>

<NameType>

<name>Vehicle License Plate Number</name>

<NameTypeAuthority>

<name>State of Iowa</name>

</NameTypeAuthority>

</NameType>

</Names>

</WorkAssets>

</Crews>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-31T17:00:00-06:00</end>

<start>2015-08-01T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

</WorkTasks>

</Work>

</MaintenanceOrder>

<MaintenanceOrder>

<mRID>89175ff3-fbea-411c-8f08-27fd64f587ec</mRID>

<Names>

<name>MO-33345</name>

<NameType>

<name>Maintenance Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Organisation>

<mRID>76e0a356-d379-4d2b-bc44-ab6f72bfcae0</mRID>

<Names>

<name>MNT08</name>

<NameType>

<name>Utility Department</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>75</extension>

<localNumber>8124</localNumber>

</phone1>

<streetAddress>

<streetDetail>

<addressGeneral>223 Commerce St, Fairfax, IA 52228</addressGeneral>

<buildingName>Main Office</buildingName>

<name>Commerce</name>

<number>223</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52228</code>

<country>USA</country>

<name>Fairfax</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</streetAddress>

</Organisation>

<Work>

<mRID>8df47902-fde9-41ec-b209-44011849cf3d</mRID>

<kind>construction</kind>

<lastModifiedDateTime>2015-07-28T15:10:22-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-28T15:10:22-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<ActivityRecords>

<createdDateTime>2015-07-28T15:10:22-06:00</createdDateTime>

<type>Maintenance Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-31T17:00:00-06:00</end>

<start>2015-08-12T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>f297c2e4-c9d7-40fa-a01c-c8f9835d7a6b</mRID>

<direction>NW</direction>

<CoordinateSystem>

<crsUrn>GPS</crsUrn>

</CoordinateSystem>

<Hazards>

<type>Flooding</type>

</Hazards>

<InternalLocation>

<BuildingName>Pumphouse</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>1</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>200</addressGeneral>

<addressGeneral2>Main St</addressGeneral2>

<addressGeneral3>Hiawatha</addressGeneral3>

<buildingName>Pumphouse</buildingName>

<name>Main</name>

<number>200</number>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52233</code>

<country>USA</country>

<name>Hiawatha</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>888</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>11</extension>

<localNumber>2322</localNumber>

</phone1>

<PositionPoints>

<sequenceNumber>1</sequenceNumber>

<xPosition>42.050356</xPosition>

<yPosition>-91.679830</yPosition>

<zPosition>858.0</zPosition>

</PositionPoints>

</WorkLocation>

<WorkTasks>

<mRID>023c4c0e-b133-4b40-971c-17f2528adb81</mRID>

<instruction>Install new lock on steel entry door</instruction>

<statusKind>scheduled</statusKind>

<subject>install lock</subject>

<taskKind>install</taskKind>

<Crews>

<mRID>79122b2e-d5ec-4344-952a-3a722f565649</mRID>

<CrewMembers>

<Person>

<firstName>Ellen</firstName>

<lastName>Greene</lastName>

</Person>

</CrewMembers>

<Names>

<name>Green, Ellen</name>

</Names>

<WorkAssets>

<mRID>ed151283-43c4-4e71-8c9f-5839befa0caa</mRID>

<critical>false</critical>

<odometerReadDateTime>2015-07-27T18:55:00-06:00</odometerReadDateTime>

<odometerReading>187433</odometerReading>

<usageKind>crew</usageKind>

<Names>

<name>45667PJ</name>

<NameType>

<name>Vehicle License Plate Number</name>

<NameTypeAuthority>

<name>State of Iowa</name>

</NameTypeAuthority>

</NameType>

</Names>

</WorkAssets>

</Crews>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-31T17:00:00-06:00</end>

<start>2015-08-12T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

</WorkTasks>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:CreatedMaintenanceOrders>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Created Maintenance Orders Notification | http://xx.xxx.xxx.xxx/ | created | MaintenanceOrders |  |

## MO-7: Server informs Client of modification of an existing Maintenance Order (Change priority and update LastModifiedDateTime)

In this test case, the Server informs the Client that the priority of an existing Maintenance Order has been changed from 3-Routine to 4-High. In addition, the time at which this change occurred is used to update the LastModifiedDateTime element. Such a notification may occur if the Client is not the original requestor of the change, but instead is being notified of the change made directly within the Server or as a result of a request by a third system. The notification may occur immediately at the time of the change or at some later date/time. This is an asynchronous notification using an Event Stereotype message. There is no response message.

In this test case, Maintenance Order MO-33344 was previously created with a priority of 3-Routine and the change in priority occurred earlier in the day.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Maintenance Order with a Names.name identifier of MO-33344 and a priority of 3-Routine, as created in test case MO-6, is assumed to exist. |
| **Post Condition(s):** | The Client is informed that the subject Maintenance Order has been modified to have a priority of 2-High and a new LastModifiedDateTime. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

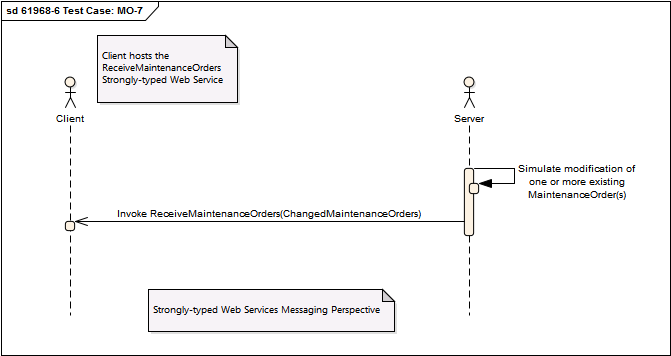


Figure ‑ Sequence Diagram for Test Case MO-7

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveMaintenanceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ChangedMaintenanceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ChangedMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>changed</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T21:04:22-06:00</msg:Timestamp>

<msg:MessageID>d5c1fd81-64b1-477e-aee2-61578fc4c8a4</msg:MessageID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<Names>

<name>MO-33344</name>

</Names>

<Work>

<mRID>0054c55c-121f-42ff-98f4-04eb6d53220e</mRID>

<lastModifiedDateTime>2015-07-28T20:50:22-06:00</lastModifiedDateTime>

<priority>

<rank>2</rank>

<type>High</type>

</priority>

</Work>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:ChangedMaintenanceOrders>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Changed Maintenance Order Notification | http://xx.xxx.xxx.xxx/ | changed | MaintenanceOrders |  |

## MO-8: Server informs Client of modification of an existing Maintenance Order (Deletion of an attribute)

In this test case, the Server informs the Client of the deletion of an extension from the phone number of the Organization to which a Maintenance Order has been assigned. This is an asynchronous notification using an Event Stereotype message. There is no response message.

***IMPORTANT: Because the intent is to remove an existing element (phone extension), it is necessary to leverage the OperationSet technique. Please refer to the subsection entitled 61968 Part 100 Considerations in Section 2 and Annex D for a more complete discussion concerning the use of OperationSets to accomplish the deletion of attributes and/or association classes. A phone extension is an example of an attribute.***

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, Maintenance Order MO-33345 was previously created earlier in the day with a phone extension of 75 for the MNT08 Organization.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Maintenance Order with a Names.name identifier of MO-33345 and a phone extension of 75 for the MNT08 Organization, as created in test case MO-6, is assumed to exist. |
| **Post Condition(s):** | The Client is informed that the subject Maintenance Order has been modified to delete the phone extension. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

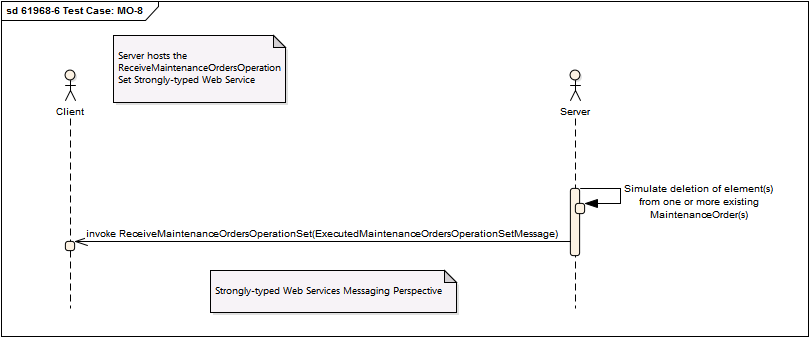


Figure ‑ Sequence Diagram for Test Case MO-8

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveMaintenanceOrdersOperationSet.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersOperationSetMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ExecutedMaintenanceOrdersOperationSet | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ExecutedMaintenanceOrdersOperationSet xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersOperationSetMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersOperationSetMessage MaintenanceOrdersOperationSetMessage.xsd">

<tns:Header>

<Verb>executed</Verb>

<Noun>MaintenanceOrders</Noun>

<Timestamp>2015-07-28T22:30:00-06:00</Timestamp>

<MessageID>69139aa0-5314-49de-ae44-7fa69dc4083d</MessageID>

</tns:Header>

<tns:Payload>

<tns:OperationSet>

<Operation>

<operationId>1</operationId>

<noun>MaintenanceOrders</noun>

<verb>deleted</verb>

<elementOperation>true</elementOperation>

<MaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrders# MaintenanceOrders.xsd">

<MaintenanceOrder>

<Names>

<name>MO-33345</name>

</Names>

<Organisation>

<Names>

<name>MNT08</name>

</Names>

<phone1>

<extension>75</extension>

</phone1>

</Organisation>

</MaintenanceOrder>

</MaintenanceOrders>

</Operation>

</tns:OperationSet>

</tns:Payload>

</tns:ExecutedMaintenanceOrdersOperationSet>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Deleted Details from existing Maintenance Order Notification | http://xx.xxx.xxx.xxx/ | executed | OperationSet\* |  |

\*The OperationSet includes a single Operation having:

* verb = "deleted"
* noun = "MaintenanceOrders"
* elementOperation = "true"

## MO-9: Server informs Client of the deletion of an existing Maintenance Order

In this test case, the Server informs the Client of the deletion of an existing Maintenance Order. This is an asynchronous notification using an Event Stereotype message. There is no response message.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, Maintenance Order MO-33344, which was previously created earlier in the day, is deleted.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Maintenance Order with a Names.name identifier of MO-33344, as created in test case MO-6, is assumed to exist. |
| **Post Condition(s):** | The Client is informed that the subject Maintenance Order has been deleted. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

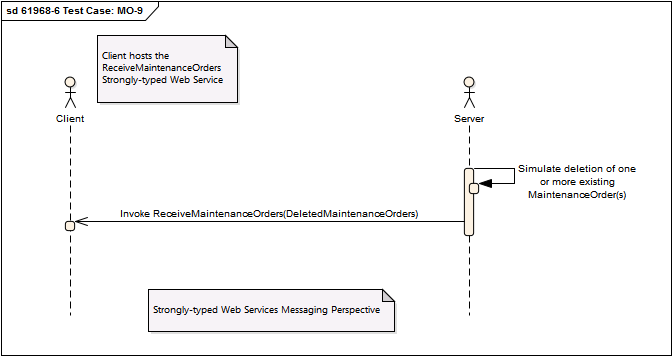


Figure ‑ Sequence Diagram for Test Case MO-9

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveMaintenanceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Maintenance Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | MaintenanceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | DeletedMaintenanceOrders | n/a |

?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:DeletedMaintenanceOrders xmlns="http://iec.ch/TC57/2015/MaintenanceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/MaintenanceOrdersMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/MaintenanceOrdersMessage MaintenanceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>deleted</msg:Verb>

<msg:Noun>MaintenanceOrders</msg:Noun>

<msg:Timestamp>2015-07-28T23:33:04-06:00</msg:Timestamp>

<msg:MessageID>38dd4c0f-582b-4d4d-b87f-d0d9a47f5d94</msg:MessageID>

</tns:Header>

<tns:Payload>

<MaintenanceOrders>

<MaintenanceOrder>

<Names>

<name>MO-33344</name>

</Names>

</MaintenanceOrder>

</MaintenanceOrders>

</tns:Payload>

</tns:DeletedMaintenanceOrders>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Deleted Details from existing Maintenance Order Notification | http://xx.xxx.xxx.xxx/ | deleted | MaintenanceOrders |  |

# Service Order Test Cases

*Note: The ServiceOrders profile has noticable differences from the WorkRequest and MaintenanceOrders profiles. Among the most significant differences is the inclusion of support for capture of meter readings associated with service work involving meter removals, installations, and exchanges. The test cases in this section are oriented towards these types of service work in order to illustrate the usage of the profile elements that are unique to the ServiceOrders profile. Meter readings are captured and conveyed in the Service Order messages at the time the work is completed. Consequently, meter readings will appear in selected test cases involving modification of existing Service Orders or retrieval of completed Service Orders and not in the test cases involving creation of Service Orders.*

## SO-1a: Client requests creation of a Service Order and Server replies (Success - Single Service Order)

In this test case, the Client requests the Server to instantiate a single Service Order. The Server returns a response message indicating success with no errors.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the Service Order would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "create" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

Also as noted, this test case illustrates the successful creation of a single Service Order. Subsequent test cases will illustrate attempts to create multiple Service Orders via a single request message as well as responses indicating various failures as well as successes.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | A new Service Order is created with the mRID and Names identifier(s) that were passed in the request message. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

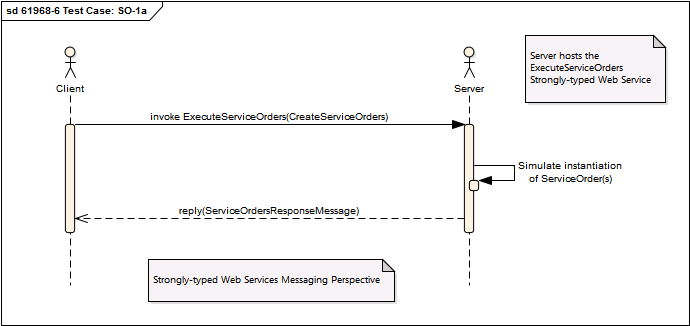


Figure ‑ Sequence Diagram for Test Case SO-1a

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateServiceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreateServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T12:11:42-06:00</msg:Timestamp>

<msg:MessageID>e7ed463a-b05a-48b1-8c44-da5496974063</msg:MessageID>

<msg:CorrelationID>dbf57e64-0787-49bf-bcaa-27fc61927f43</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<ServiceOrders>

<ServiceOrder>

<mRID>65be755c-109f-467a-84ff-9c93fdefeeb7</mRID>

<Names>

<name>SO-36784</name>

<NameType>

<name>Service Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>e1df59f5-c152-4451-b7b4-7c36afd653db</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-29T12:11:40-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-29T12:11:40-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<type>Meter Exchange</type>

<ActivityRecords>

<createdDateTime>2015-07-29T12:11:40-06:00</createdDateTime>

<reason>Calibration due</reason>

<severity>Normal</severity>

<type>Service Order Created</type>

</ActivityRecords>

<Appointments>

<callAhead>true</callAhead>

<meetingInterval>

<end>2015-08-01T14:00:00-06:00</end>

<start>2015-08-01T13:00:00-06:00</start>

</meetingInterval>

</Appointments>

<Customers>

<mRID>4bcaa968-2079-4e03-aedd-bf968be4b380</mRID>

<kind>residential</kind>

<CustomerAgreements>

<mRID>237c1efa-c187-4b5d-9ba0-987f8a7c95d8</mRID>

</CustomerAgreements>

<Names>

<name>Michels, Mary</name>

</Names>

</Customers>

<priority>

<justification>Appointment required</justification>

<rank>2</rank>

<type>High</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T14:00:00-06:00</end>

<start>2015-08-01T13:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>f5ce974a-8937-4db8-aa96-e03a358a2799</mRID>

<Hazards>

<type>Dog</type>

</Hazards>

<InternalLocation>

<BuildingName>Residence</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>BSMT</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2204 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2204</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>319</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<localNumber>6538</localNumber>

</phone1>

</WorkLocation>

<WorkTasks>

<mRID>f5ac0622-cc7d-4064-ab3f-bdd53fe0174a</mRID>

<crewETA>2015-08-01T13:00:00-06:00</crewETA>

<instruction>Perform meter exchange</instruction>

<statusKind>scheduled</statusKind>

<subject>Meter exchange</subject>

<taskKind>exchange</taskKind>

<Crews>

<mRID>1621e551-fa4c-478a-93ba-8ee2ffc6e073</mRID>

<CrewMembers>

<Person>

<firstName>Gretta</firstName>

<lastName>Nichols</lastName>

</Person>

</CrewMembers>

<Names>

<name>Nichols, Gretta</name>

</Names>

</Crews>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T14:00:00-06:00</end>

<start>2015-08-01T13:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<UsagePoint>

<mRID>b0f46cbf-5315-44f8-b116-3e98ace55066</mRID>

<connectionState>connected</connectionState>

<isSdp>true</isSdp>

<nominalServiceVoltage>240</nominalServiceVoltage>

<ratedCurrent>200</ratedCurrent>

<serviceDeliveryRemark>Call ahead for access to basement</serviceDeliveryRemark>

<MetrologyRequirements>

<mRID>48c5068e-5b46-4ecf-9d06-db6ab9ace3f5</mRID>

<ReadingTypes ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</MetrologyRequirements>

<ServiceCategory>

<kind>electricity</kind>

</ServiceCategory>

<ServiceMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</ServiceMultipliers>

<UsagePointLocation>

<mRID>7fe651da-e9f5-4687-9ac9-ba5223f02c65</mRID>

<remark>Call ahead for access</remark>

<siteAccessProblem>Basement location</siteAccessProblem>

<InternalLocation>

<BuildingName>Residence</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>BSMT</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2204 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2204</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</UsagePointLocation>

</UsagePoint>

</WorkTasks>

</Work>

</ServiceOrder>

</ServiceOrders>

</tns:Payload>

</tns:CreateServiceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | ServiceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | ServiceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ServiceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T12:11:45-06:00</msg:Timestamp>

<msg:MessageID>e8b81686-7025-47a8-a078-6d74dbb3bd73</msg:MessageID>

<msg:CorrelationID>dbf57e64-0787-49bf-bcaa-27fc61927f43</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:ServiceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Service Order | http://xx.xxx.xxx.xxx/ | create | ServiceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | ServiceOrders |  |

## SO-1b: Client requests creation of a Service Order and Server replies (Failure - Single Service Order)

In this test case, the Client requests the Server to instantiate a single Service Order; however the ID of the Service Order is the same as in Test Case SO-1a. Consquently, the Server returns a response message indicating a failure based on a business rule prohibiting duplicate Service Orders.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

Also as noted, this test case illustrates a failure of a request to create a single Service Order. Subsequent test cases will illustrate attempts to create multiple Service Orders via a single request message as well as responses indicating various failures as well as successes.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | Creation of the Service Order failed as indicated in the Step 2 response message. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

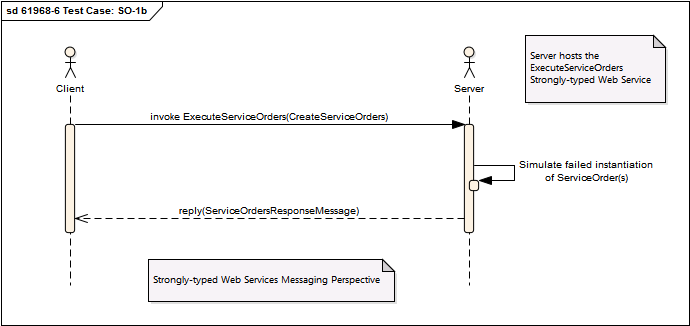


Figure ‑ Sequence Diagram for Test Case SO-1b

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateServiceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreateServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T12:56:33-06:00</msg:Timestamp>

<msg:MessageID>f4dd99ea-2cba-47b3-b3f2-87169e8e119c</msg:MessageID>

<msg:CorrelationID>049bc258-cefd-438c-9956-7360fa7e4b6e</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<ServiceOrders>

<ServiceOrder>

<mRID>65be755c-109f-467a-84ff-9c93fdefeeb7</mRID>

<Names>

<name>SO-36784</name>

<NameType>

<name>Service Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>e1df59f5-c152-4451-b7b4-7c36afd653db</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-29T12:11:40-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-29T12:11:40-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<type>Meter Exchange</type>

<ActivityRecords>

<createdDateTime>2015-07-29T12:11:40-06:00</createdDateTime>

<reason>Calibration due</reason>

<severity>Normal</severity>

<type>Service Order Created</type>

</ActivityRecords>

<Appointments>

<callAhead>true</callAhead>

<meetingInterval>

<end>2015-08-01T14:00:00-06:00</end>

<start>2015-08-01T13:00:00-06:00</start>

</meetingInterval>

</Appointments>

<Customers>

<mRID>4bcaa968-2079-4e03-aedd-bf968be4b380</mRID>

<kind>residential</kind>

<CustomerAgreements>

<mRID>237c1efa-c187-4b5d-9ba0-987f8a7c95d8</mRID>

</CustomerAgreements>

<Names>

<name>Michels, Mary</name>

</Names>

</Customers>

<priority>

<justification>Appointment required</justification>

<rank>2</rank>

<type>High</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T14:00:00-06:00</end>

<start>2015-08-01T13:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>f5ce974a-8937-4db8-aa96-e03a358a2799</mRID>

<Hazards>

<type>Dog</type>

</Hazards>

<InternalLocation>

<BuildingName>Residence</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>BSMT</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2204 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2204</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>319</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<localNumber>6538</localNumber>

</phone1>

</WorkLocation>

<WorkTasks>

<mRID>f5ac0622-cc7d-4064-ab3f-bdd53fe0174a</mRID>

<crewETA>2015-08-01T13:00:00-06:00</crewETA>

<instruction>Perform meter exchange</instruction>

<statusKind>scheduled</statusKind>

<subject>Meter exchange</subject>

<taskKind>exchange</taskKind>

<Crews>

<mRID>1621e551-fa4c-478a-93ba-8ee2ffc6e073</mRID>

<CrewMembers>

<Person>

<firstName>Gretta</firstName>

<lastName>Nichols</lastName>

</Person>

</CrewMembers>

<Names>

<name>Nichols, Gretta</name>

</Names>

</Crews>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T14:00:00-06:00</end>

<start>2015-08-01T13:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<UsagePoint>

<mRID>b0f46cbf-5315-44f8-b116-3e98ace55066</mRID>

<connectionState>connected</connectionState>

<isSdp>true</isSdp>

<nominalServiceVoltage>240</nominalServiceVoltage>

<ratedCurrent>200</ratedCurrent>

<serviceDeliveryRemark>Call ahead for access to basement</serviceDeliveryRemark>

<MetrologyRequirements>

<mRID>48c5068e-5b46-4ecf-9d06-db6ab9ace3f5</mRID>

<ReadingTypes ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</MetrologyRequirements>

<ServiceCategory>

<kind>electricity</kind>

</ServiceCategory>

<ServiceMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</ServiceMultipliers>

<UsagePointLocation>

<mRID>7fe651da-e9f5-4687-9ac9-ba5223f02c65</mRID>

<remark>Call ahead for access</remark>

<siteAccessProblem>Basement location</siteAccessProblem>

<InternalLocation>

<BuildingName>Residence</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>BSMT</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2204 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2204</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</UsagePointLocation>

</UsagePoint>

</WorkTasks>

</Work>

</ServiceOrder>

</ServiceOrders>

</tns:Payload>

</tns:CreateServiceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | ServiceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | ServiceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ServiceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T12:56:36-06:00</msg:Timestamp>

<msg:MessageID>176e2ce4-5199-4c4c-a0d5-19d9c975945b</msg:MessageID>

<msg:CorrelationID>049bc258-cefd-438c-9956-7360fa7e4b6e</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>FAILED</msg:Result>

<msg:Error>

<msg:code>6.1</msg:code>

<msg:level>FATAL</msg:level>

<msg:details>Request cancelled per business rule</msg:details>

<msg:ID idType="Service Order Number" idAuthority="Utility XYZ" kind="name" objectType="ServiceOrder">SO-36784</msg:ID>

</msg:Error>

</tns:Reply>

</tns:ServiceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Service Order | http://xx.xxx.xxx.xxx/ | create | ServiceOrders |  |
| 2 | Failure Response | http://xx.xxx.xxx.xxx/ | reply | ServiceOrders |  |

## SO-1c: Client requests creation of two Service Orders and Server replies (Success - Two Service Orders in a single message)

In this test case, the Client requests the Server to instantiate two Service Orders. The Server returns a response message indicating success with no errors.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the Service Orders would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "create" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | Two new Service Orders are created with the Names identifiers that were passed in the request message. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

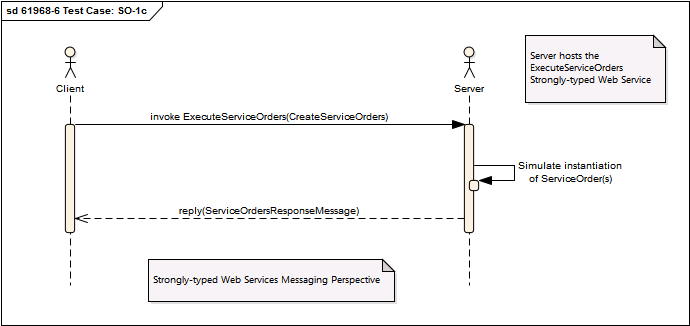


Figure ‑ Sequence Diagram for Test Case SO-1c

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateServiceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreateServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T13:14:08-06:00</msg:Timestamp>

<msg:MessageID>0b6b45b2-cd2c-43e7-b2bc-eed13fb2a8d9</msg:MessageID>

<msg:CorrelationID>2fb77797-b5c2-44f8-aa62-0d4c7f0a2aaa</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<ServiceOrders>

<ServiceOrder>

<mRID>1641e7f1-6337-415d-81b3-d517ad2eedb5</mRID>

<Names>

<name>SO-56214</name>

<NameType>

<name>Service Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>3501040a-0359-4b97-8742-a60a7043233a</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-29T13:14:04-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-29T13:14:04-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<type>Meter Exchange</type>

<ActivityRecords>

<createdDateTime>2015-07-29T13:14:04-06:00</createdDateTime>

<reason>Calibration due</reason>

<severity>Normal</severity>

<type>Service Order Created</type>

</ActivityRecords>

<Appointments>

<callAhead>true</callAhead>

<meetingInterval>

<end>2015-08-01T15:00:00-06:00</end>

<start>2015-08-01T14:00:00-06:00</start>

</meetingInterval>

</Appointments>

<Customers>

<mRID>9de93d13-a979-4903-a0e9-29b650988b41</mRID>

<kind>residential</kind>

<CustomerAgreements>

<mRID>0f5116f9-8eef-41bb-953c-f944b8675dbd</mRID>

</CustomerAgreements>

<Names>

<name>Dickerson, Earl</name>

</Names>

</Customers>

<priority>

<justification>Appointment required</justification>

<rank>2</rank>

<type>High</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T15:00:00-06:00</end>

<start>2015-08-01T14:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>e74236bd-5741-4eac-b45d-2b9d4ee50ba2</mRID>

<InternalLocation>

<BuildingName>Residence</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>BSMT</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2206 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2204</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>319</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<localNumber>2133</localNumber>

</phone1>

</WorkLocation>

<WorkTasks>

<mRID>23d0b4e7-404c-45b4-8c91-db77920fc969</mRID>

<crewETA>2015-08-01T14:00:00-06:00</crewETA>

<instruction>Perform meter exchange</instruction>

<statusKind>scheduled</statusKind>

<subject>Meter exchange</subject>

<taskKind>exchange</taskKind>

<Crews>

<mRID>1621e551-fa4c-478a-93ba-8ee2ffc6e073</mRID>

<CrewMembers>

<Person>

<firstName>Gretta</firstName>

<lastName>Nichols</lastName>

</Person>

</CrewMembers>

<Names>

<name>Nichols, Gretta</name>

</Names>

</Crews>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T15:00:00-06:00</end>

<start>2015-08-01T14:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<UsagePoint>

<mRID>71ca95f3-f789-41e1-a412-31e0a370faba</mRID>

<connectionState>connected</connectionState>

<isSdp>true</isSdp>

<nominalServiceVoltage>240</nominalServiceVoltage>

<ratedCurrent>200</ratedCurrent>

<serviceDeliveryRemark>Call ahead for access to basement</serviceDeliveryRemark>

<MetrologyRequirements>

<mRID>48c5068e-5b46-4ecf-9d06-db6ab9ace3f5</mRID>

<ReadingTypes ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</MetrologyRequirements>

<ServiceCategory>

<kind>electricity</kind>

</ServiceCategory>

<ServiceMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</ServiceMultipliers>

<UsagePointLocation>

<mRID>03aef6e3-55cf-455c-8865-705424a4844d</mRID>

<remark>Call ahead for access</remark>

<siteAccessProblem>Basement location</siteAccessProblem>

<InternalLocation>

<BuildingName>Residence</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>BSMT</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2206 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2206</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</UsagePointLocation>

</UsagePoint>

</WorkTasks>

</Work>

</ServiceOrder>

<ServiceOrder>

<mRID>fd6b6141-c5ff-48ab-b5e5-7348292098c1</mRID>

<Names>

<name>SO-56215</name>

<NameType>

<name>Service Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>ec6a4b6c-716e-4c3b-8607-b316615f8348</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-29T13:14:05-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-29T13:14:05-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<type>Meter Exchange</type>

<ActivityRecords>

<createdDateTime>2015-07-29T13:14:05-06:00</createdDateTime>

<reason>Calibration due</reason>

<severity>Normal</severity>

<type>Service Order Created</type>

</ActivityRecords>

<Appointments>

<callAhead>true</callAhead>

<meetingInterval>

<end>2015-08-01T16:00:00-06:00</end>

<start>2015-08-01T15:00:00-06:00</start>

</meetingInterval>

</Appointments>

<Customers>

<mRID>2895e1b7-e0e9-4d99-880c-e5c7c6f6fe3a</mRID>

<kind>residential</kind>

<CustomerAgreements>

<mRID>96404301-b5f9-4229-b794-8101edbf83fd</mRID>

</CustomerAgreements>

<Names>

<name>Kline, Gerald</name>

</Names>

</Customers>

<priority>

<justification>Appointment required</justification>

<rank>2</rank>

<type>High</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T16:00:00-06:00</end>

<start>2015-08-01T15:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fd3e6dc1-4a30-4108-9f75-e730b9b52faa</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>2208 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2208</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>319</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<localNumber>9924</localNumber>

</phone1>

</WorkLocation>

<WorkTasks>

<mRID>7d01c6b4-a532-4824-9305-da97717bacf2</mRID>

<crewETA>2015-08-01T15:00:00-06:00</crewETA>

<instruction>Perform meter exchange</instruction>

<statusKind>scheduled</statusKind>

<subject>Meter exchange</subject>

<taskKind>exchange</taskKind>

<Crews>

<mRID>1621e551-fa4c-478a-93ba-8ee2ffc6e073</mRID>

<CrewMembers>

<Person>

<firstName>Gretta</firstName>

<lastName>Nichols</lastName>

</Person>

</CrewMembers>

<Names>

<name>Nichols, Gretta</name>

</Names>

</Crews>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T16:00:00-06:00</end>

<start>2015-08-01T15:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<UsagePoint>

<mRID>ef856c2d-26d6-4491-9bcf-aad4fca20078</mRID>

<connectionState>connected</connectionState>

<isSdp>true</isSdp>

<nominalServiceVoltage>240</nominalServiceVoltage>

<ratedCurrent>200</ratedCurrent>

<MetrologyRequirements>

<mRID>48c5068e-5b46-4ecf-9d06-db6ab9ace3f5</mRID>

<ReadingTypes ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</MetrologyRequirements>

<ServiceCategory>

<kind>electricity</kind>

</ServiceCategory>

<ServiceMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</ServiceMultipliers>

<UsagePointLocation>

<mRID>476fc26a-53d8-4510-8b0a-436a1859ab57</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>2208 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2208</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</UsagePointLocation>

</UsagePoint>

</WorkTasks>

</Work>

</ServiceOrder>

</ServiceOrders>

</tns:Payload>

</tns:CreateServiceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | ServiceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | ServiceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ServiceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T13:14:11-06:00</msg:Timestamp>

<msg:MessageID>2d9b3be2-af50-4bf1-a812-8058bbd28b94</msg:MessageID>

<msg:CorrelationID>2fb77797-b5c2-44f8-aa62-0d4c7f0a2aaa</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:ServiceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Service Order | http://xx.xxx.xxx.xxx/ | create | ServiceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | ServiceOrders |  |

## SO-1d: Client requests creation of two Service Orders and Server replies (Two Service Orders in a single message - One succeeds and one fails)

In this test case, the Client requests the Server to instantiate two Service Orders. The Server returns a response message indicating that instantiation of the second Service Order failed. Since no error is reported for the first Service Order, the interpretation of the response message is that the instantiation of the first Service Order succeeded.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the first of the two Service Orders would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "create" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | None |
| **Post Condition(s):** | One new Service Order is created with the Names identifier that was passed in the request message. An error is returned indicating that instantiation of the second Service Order failed. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

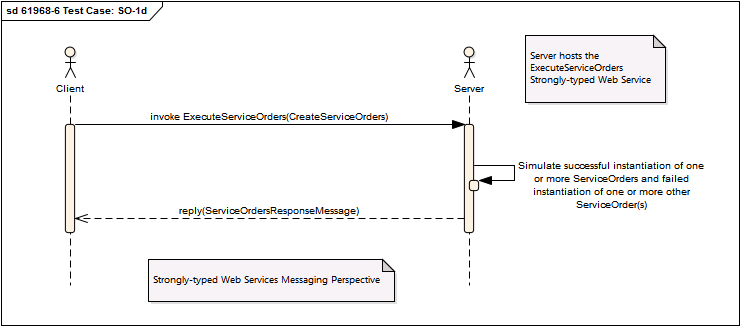


Figure ‑ Sequence Diagram for Test Case SO-1d

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreateServiceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreateServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>create</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T14:11:28-06:00</msg:Timestamp>

<msg:MessageID>5aac2f0f-11b9-4c80-bce6-784d36f80575</msg:MessageID>

<msg:CorrelationID>c1dc653f-9237-4808-9614-0b12dbf46996</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<ServiceOrders>

<ServiceOrder>

<mRID>2810a605-70bb-4e87-9039-d66c013ac58b</mRID>

<Names>

<name>SO-86339</name>

<NameType>

<name>Service Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>ce728e3c-6f85-4d72-9222-4931ad77b2c8</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-29T14:11:24-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-29T14:11:24-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<type>Meter Removal</type>

<ActivityRecords>

<createdDateTime>2015-07-29T14:11:24-06:00</createdDateTime>

<reason>Move out - Residence to be unoccupied</reason>

<severity>Normal</severity>

<type>Service Order Created</type>

</ActivityRecords>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-02T17:00:00-06:00</end>

<start>2015-08-02T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>65b122e3-a331-4b77-80a3-9a3206c6b523</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>13445 Grant Circle SW, Cedar Rapids, IA 52404</addressGeneral>

<name>Grant</name>

<number>13445</number>

<suffix>SW</suffix>

<type>Circle</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52404</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>8e4557ce-ffc4-499b-88ba-e06b42b11885</mRID>

<instruction>Remove meter</instruction>

<statusKind>scheduled</statusKind>

<subject>Meter removal</subject>

<taskKind>remove</taskKind>

<Crews>

<mRID>47c49565-1bf6-4087-a517-849862cc8358</mRID>

<CrewMembers>

<Person>

<firstName>Robbie</firstName>

<lastName>Conrad</lastName>

</Person>

</CrewMembers>

<Names>

<name>Conrad, Robbie</name>

</Names>

</Crews>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-02T17:00:00-06:00</end>

<start>2015-08-02T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<UsagePoint>

<mRID>f0036e5a-e238-4de4-b581-2e7ec0249525</mRID>

<connectionState>connected</connectionState>

<isSdp>true</isSdp>

<ratedCurrent>200</ratedCurrent>

<ServiceCategory>

<kind>electricity</kind>

</ServiceCategory>

<UsagePointLocation>

<mRID>f0036e5a-e238-4de4-b581-2e7ec0249525</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>13445 Grant circle SW, Cedar Rapids, IA 52404</addressGeneral>

<name>Grant</name>

<number>13445</number>

<suffix>SW</suffix>

<type>Circle</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52404</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</UsagePointLocation>

</UsagePoint>

</WorkTasks>

</Work>

</ServiceOrder>

<ServiceOrder>

<mRID>a768c62c-89c6-4310-a350-35f8ab19dfd3</mRID>

<Names>

<name>SO-86340</name>

<NameType>

<name>Service Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>1f63d885-b4ac-48ca-80a5-8aa679eb51dd</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-29T14:11:26-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-29T14:11:26-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<type>Meter Installation</type>

<ActivityRecords>

<createdDateTime>2015-07-29T14:11:26-06:00</createdDateTime>

<reason>Tenant move-in</reason>

<severity>Normal</severity>

<type>Service Order Created</type>

</ActivityRecords>

<Customers>

<mRID>6b81797b-f4f4-4f4a-8422-ba4d0b0a16ec</mRID>

<kind>residential</kind>

<CustomerAgreements>

<mRID>6b81797b-f4f4-4f4a-8422-ba4d0b0a16ec</mRID>

</CustomerAgreements>

<Names>

<name>Myers, Betsy</name>

</Names>

</Customers>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-09-01T12:00:00-06:00</end>

<start>2015-09-01T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>65b122e3-a331-4b77-80a3-9a3206c6b523</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>13445 Grant Circle SW, Cedar Rapids, IA 52404</addressGeneral>

<name>Grant</name>

<number>13445</number>

<suffix>SW</suffix>

<type>Circle</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52404</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</WorkLocation>

<WorkTasks>

<mRID>2d87e6ae-1b17-4d10-99a7-0e62474f4452</mRID>

<crewETA>2015-09-01T08:00:00-06:00</crewETA>

<instruction>Perform meter installation</instruction>

<statusKind>scheduled</statusKind>

<subject>Meter installation</subject>

<taskKind>install</taskKind>

<Crews>

<mRID>1621e551-fa4c-478a-93ba-8ee2ffc6e073</mRID>

<CrewMembers>

<Person>

<firstName>Gretta</firstName>

<lastName>Nichols</lastName>

</Person>

</CrewMembers>

<Names>

<name>Nichols, Gretta</name>

</Names>

</Crews>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-09-01T12:00:00-06:00</end>

<start>2015-09-01T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<UsagePoint>

<mRID>f0036e5a-e238-4de4-b581-2e7ec0249525</mRID>

<isSdp>true</isSdp>

<nominalServiceVoltage>240</nominalServiceVoltage>

<ratedCurrent>200</ratedCurrent>

<MetrologyRequirements>

<mRID>48c5068e-5b46-4ecf-9d06-db6ab9ace3f5</mRID>

<ReadingTypes ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</MetrologyRequirements>

<ServiceCategory>

<kind>electricity</kind>

</ServiceCategory>

<ServiceMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</ServiceMultipliers>

<UsagePointLocation>

<mRID>f0036e5a-e238-4de4-b581-2e7ec0249525</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>13445 Grant circle SW, Cedar Rapids, IA 52404</addressGeneral>

<name>Grant</name>

<number>13445</number>

<suffix>SW</suffix>

<type>Circle</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52404</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</UsagePointLocation>

</UsagePoint>

</WorkTasks>

</Work>

</ServiceOrder>

</ServiceOrders>

</tns:Payload>

</tns:CreateServiceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | ServiceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | ServiceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ServiceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T14:11:31-06:00</msg:Timestamp>

<msg:MessageID>c9a08705-72db-433a-ba58-8c5a9b8ea509</msg:MessageID>

<msg:CorrelationID>c1dc653f-9237-4808-9614-0b12dbf46996</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>FAILED</msg:Result>

<msg:Error>

<msg:code>6.1</msg:code>

<msg:level>FATAL</msg:level>

<msg:details>Request cancelled per business rule</msg:details>

<msg:ID idType="Service Order Number" idAuthority="Utility XYZ" kind="name" objectType="ServiceOrder">SO-86340</msg:ID>

</msg:Error>

</tns:Reply>

</tns:ServiceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Create Service Order | http://xx.xxx.xxx.xxx/ | create | ServiceOrders |  |
| 2 | Mixed Success / Failure Response | http://xx.xxx.xxx.xxx/ | reply | ServiceOrders |  |

## SO-2: Client requests modification of an existing Service Order and Server replies (Success - Service Order Completion)

In this test case, the Client requests the Server to modify an existing Service Order. Contrary to the simple modification of a Work Request illustrated in test case WR-2a and of a Maintenance Order illustrated in test case MO-2a, this test case illustrates an extensive update associated with completing the Service Order and capturing the final reading of the removed meter (OldAsset) and the initial reading of the installed meter (New Asset).

*Note: In this example, the ReadingType and ReadingQualityType elements at the root level of the ServiceOrders XSD are not populated. Leaving these unpopulated is the normal practice since the ReadingType and ReadingQualityType codes are normatively specified in the IEC 61968-9 standard. For an example in which these elements are populated, please refer to test case SO-5.*

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Service Order with a Names.name identifier of SO-36784, as created in test case SO-1a, is assumed to exist. |
| **Post Condition(s):** | The subject Service Order is modified to have a new schedule. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

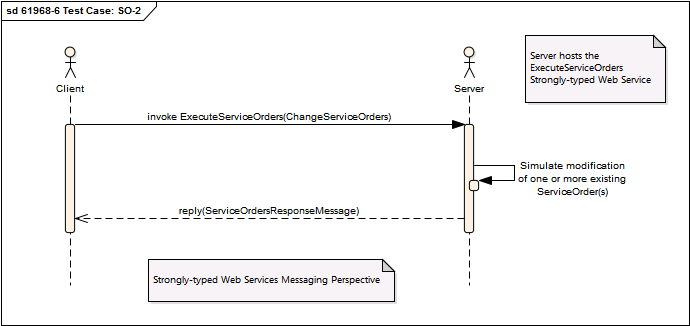


Figure ‑ Sequence Diagram for Test Case SO-2

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ChangeServiceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ChangeServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>change</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-08-01T13:20:15-06:00</msg:Timestamp>

<msg:MessageID>b1902e6c-49d0-4190-96ce-c8bbaab3aa3d</msg:MessageID>

<msg:CorrelationID>7d55999e-9acc-4498-99cb-ea650c19c3c3</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<ServiceOrders>

<ServiceOrder>

<Names>

<name>SO-36784</name>

</Names>

<Work>

<mRID>e1df59f5-c152-4451-b7b4-7c36afd653db</mRID>

<lastModifiedDateTime>2015-08-01T13:20:15-06:00</lastModifiedDateTime>

<statusKind>completed</statusKind>

<ActivityRecords>

<createdDateTime>2015-08-01T13:20:15-06:00</createdDateTime>

<type>Service Order Completed</type>

</ActivityRecords>

<TimeSchedules>

<kind>actual</kind>

<scheduleInterval>

<end>2015-08-01T13:21:00-06:00</end>

<start>2015-08-01T13:16:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkTasks>

<mRID>f5ac0622-cc7d-4064-ab3f-bdd53fe0174a</mRID>

<statusKind>completed</statusKind>

<Assets>

<mRID>aa20d219-0470-4a7f-9655-7fcdd7bdb048</mRID>

<amrSystem>Itron</amrSystem>

<formNumber>2S</formNumber>

<MeterMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</MeterMultipliers>

<MeterReadings>

<Readings>

<reason>installation</reason>

<reportedDateTime>2015-08-01T13:20:10-06:00</reportedDateTime>

<timeStamp>2015-08-01T13:20:10-06:00</timeStamp>

<value>14233</value>

<ReadingQualities>

<timeStamp>2015-08-01T13:20:10-06:00</timeStamp>

<ReadingQualityType ref="1.0.0"/>

</ReadingQualities>

<ReadingType ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</Readings>

</MeterReadings>

<Names>

<name>MTR-98447629</name>

<NameType>

<name>Meter Badge Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Assets>

<OldAsset>

<mRID>ff7f1105-434c-419a-b823-a74c97626744</mRID>

<amrSystem>Itron</amrSystem>

<formNumber>2S</formNumber>

<MeterMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</MeterMultipliers>

<MeterReadings>

<Readings>

<reason>removal</reason>

<reportedDateTime>2015-08-01T13:19:18-06:00</reportedDateTime>

<timeStamp>2015-08-01T13:19:18-06:00</timeStamp>

<value>69877</value>

<ReadingQualities>

<timeStamp>2015-08-01T13:19:18-06:00</timeStamp>

<ReadingQualityType ref="1.0.0"/>

</ReadingQualities>

<ReadingType ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</Readings>

</MeterReadings>

<Names>

<name>MTR-22387601</name>

<NameType>

<name>Meter Badge Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</OldAsset>

<TimeSchedules>

<kind>actual</kind>

<scheduleInterval>

<end>2015-08-01T13:21:00-06:00</end>

<start>2015-08-01T13:16:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

</WorkTasks>

</Work>

</ServiceOrder>

</ServiceOrders>

</tns:Payload>

</tns:ChangeServiceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | ServiceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ServiceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ServiceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-08-01T13:20:18-06:00</msg:Timestamp>

<msg:MessageID>92c1b64b-1587-4fe1-b5a9-ed410ddaa4e5</msg:MessageID>

<msg:CorrelationID>7d55999e-9acc-4498-99cb-ea650c19c3c3</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:ServiceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Change Service Order | http://xx.xxx.xxx.xxx/ | change | ServiceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | ServiceOrders |  |

## SO-3: Client requests modification of an existing Service Order and Server replies (Success - Delete an Internal Location)

In this test case, the Client requests the Server to modify an existing Service Order by deleting the InternalLocation from the WorkLocation. The Server returns a response message indicating success with no errors.

***IMPORTANT: Because the intent is to remove an existing element, it is necessary to leverage the OperationSet technique. Please refer to the subsection entitled 61968 Part 100 Considerations in Section 2 and Annex D for a more complete discussion concerning the use of OperationSets to accomplish the deletion of attributes and/or association classes. An InternalLocation is an example of an association class - in the UML an InternalLocation is a separate CIM object that is associated with a WorkLocation. Attributes, in contrast, are just that - they appear in the UML as an attribute of a CIM Class (sometimes inherited from a parent class).***

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, ServiceOrder SO-56214 already exists and has a WorkLocation with an InternalLocation. This test case will delete the InternalLocation.

*Note: InternalLocation also exists within the UsagePointLocation for Service Order SO-56214. This instance of InternalLocation remains.*

|  |  |
| --- | --- |
| **Pre-Condition(s)** | Service Order SO-56214, with a WorkLocation having an InternalLocation, as created in test case SO-1c, is assumed to exist. |
| **Post Condition(s):** | The subject Service Order is modified to have the InternalLocation removed from the WorkLocation. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

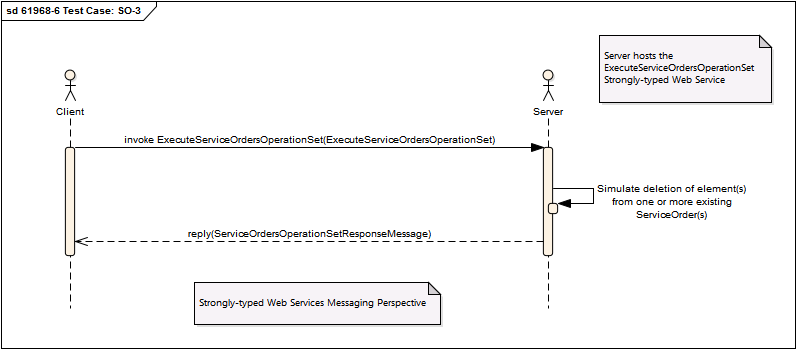


Figure ‑ Sequence Diagram for Test Case SO-3

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrdersOperationSet.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | ServiceOrdersOperationSetMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ExecuteServiceOrdersOperationSet | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ExecuteServiceOrdersOperationSet xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersOperationSetMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersOperationSetMessage ServiceOrdersOperationSetMessage.xsd">

<tns:Header>

<Verb>execute</Verb>

<Noun>OperationSet</Noun>

<Timestamp>2015-07-29T16:35:30-06:00</Timestamp>

<MessageID>9546c7e2-e41c-4f0f-92c0-58cc3a9a7412</MessageID>

<CorrelationID>96dcddf5-6679-4b87-babd-7edcbee0eb14</CorrelationID>

</tns:Header>

<tns:Payload>

<tns:OperationSet>

<Operation>

<operationId>1</operationId>

<noun>ServiceOrders</noun>

<verb>delete</verb>

<elementOperation>true</elementOperation>

<ServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrders# ServiceOrders.xsd">

<ServiceOrder>

<Names>

<name>SO-56214</name>

</Names>

<Work>

<mRID>3501040a-0359-4b97-8742-a60a7043233a</mRID>

<WorkLocation>

<mRID>e74236bd-5741-4eac-b45d-2b9d4ee50ba2</mRID>

<InternalLocation>

<BuildingName>Residence</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>BSMT</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

</WorkLocation>

</Work>

</ServiceOrder>

</ServiceOrders>

</Operation>

</tns:OperationSet>

</tns:Payload>

</tns:ExecuteServiceOrdersOperationSet>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrdersOperationSet.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | ServiceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | ServiceOrdersOperationSetMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ServiceOrdersOperationSetResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ServiceOrdersOperationSetResponseMessage xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersOperationSetMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersOperationSetMessage ServiceOrdersOperationSetMessage.xsd">

<tns:Header>

<Verb>reply</Verb>

<Noun>OperationSet</Noun>

<Timestamp>2015-07-29T16:35:33-06:00</Timestamp>

<MessageID>d1ce7814-7d4e-4a0f-94e7-0b70988aeedd</MessageID>

<CorrelationID>96dcddf5-6679-4b87-babd-7edcbee0eb14</CorrelationID>

</tns:Header>

<tns:Reply>

<Result>OK</Result>

<Error>

<code>0.0</code>

<operationId>1</operationId>

</Error>

<operationId>1</operationId>

</tns:Reply>

</tns:ServiceOrdersOperationSetResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Delete Details from existing Service Order | http://xx.xxx.xxx.xxx/ | execute | OperationSet\* |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | OperationSet\* |  |

\*The OperationSet includes a single Operation having:

* verb = "delete"
* noun = "ServiceOrders"
* elementOperation = "true"

## SO-4: Client requests deletion of an existing Service Order and Server replies (Success)

In this test case, the Client requests the Server to delete an existing Service Order (in its entirety). The Server returns a response message indicating success with no errors.

It is noted that in practice, ServiceOrders would seldom be deleted; instead they would more likely be closed or cancelled. Nevertheless, this use case is included for completeness and to distinguish the deletion of a Service Order in its entirety from the deletion of attributes or associated classes from an existing Service Order (as illustrated in test case SO-3).

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, ServiceOrder SO-86339, which was previously created in test case SO-1d, will be deleted. However, for illustrative purposes, this deletion will be processed by referencing the mRID of the existing ServiceOrder ("2810a605-70bb-4e87-9039-d66c013ac58b ", as assigned when it was created in test case SO-1a) rather than its Names.name identifier of SO-14657.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Service Order with a Names.name identifier of SO-86339 and mRID of 2810a605-70bb-4e87-9039-d66c013ac58b, as created in test case SO-1d, is assumed to exist. |
| **Post Condition(s):** | The subject Service Order is deleted. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

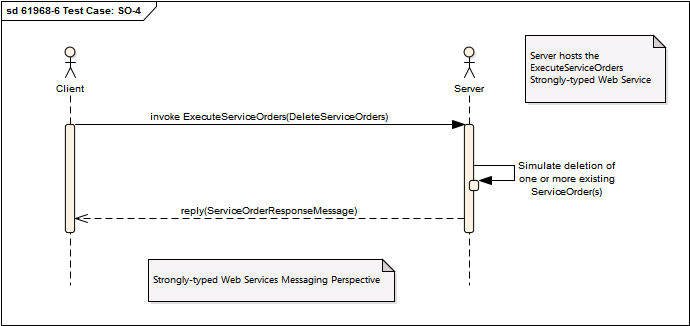


Figure ‑ Sequence Diagram for Test Case SO-4

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | DeleteServiceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:DeleteServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>delete</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T17:00:34-06:00</msg:Timestamp>

<msg:MessageID>aabc24e4-728a-4091-80b1-60fc1abcf8de</msg:MessageID>

<msg:CorrelationID>f86655e5-3cd0-4d21-957f-0fed8e065226</msg:CorrelationID>

</tns:Header>

<tns:Payload>

<ServiceOrders>

<ServiceOrder>

<mRID>2810a605-70bb-4e87-9039-d66c013ac58b</mRID>

</ServiceOrder>

</ServiceOrders>

</tns:Payload>

</tns:DeleteServiceOrders>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ExecuteServiceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | ServiceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ServiceOrdersResponseMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ServiceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T17:00:36-06:00</msg:Timestamp>

<msg:MessageID>69f62af4-307a-4d71-8409-9bc57ee25c34</msg:MessageID>

<msg:CorrelationID>f86655e5-3cd0-4d21-957f-0fed8e065226</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

</tns:ServiceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Delete existing Service Order | http://xx.xxx.xxx.xxx/ | delete | ServiceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | ServiceOrders |  |

## SO-5: Client requests retrieval of Service Orders and Server replies (Success - Two Service Orders in a single message)

In this test case, the Client requests the Server to provide the details of two Service Order(s), making the request by explicityl identifying the desired Service Orders by their identifiers. The Server returns a response message indicating success with no errors and including the details of the current state of the two Service Orders in the payload section of the response message.

*Note 1: The parameters for the request query (in this case the identifiers of the two Service Orders, are supplied using XML generated using the GetMeterReadings profile . The xml for this request is placed in the Request section of the Message envelope and not in the Payload section of the message envelope.*

*Note 2: Not all response messages will contain a payload; only those for which the query returns one or more Service Orders will have contents in the payload section. In response messages that contain a payload, the payload must validate against the "constrained" version of the ServiceOrders.xsd that is used for "create" scenarios and not the "unconstrained" version that is used for "change or delete" scenarios.*

In this tesst case, one of the requested Service Orders (SO-36784) was previously created in test case SO-1a and modified with completion details and meter readings in test case SO-2. Careful examination of the below example message will reveal that the payload contains a combination of elements from the creation and modification steps. This includes, for example, 2 instances of ActivityRecords and two instances of TimeSchedules in addition to the meter readings and asset information. The other Service Order (SO-56215) , was previously created in test case SO-1c and not subsequently modified or deleted. Therefore the payload in the below example message reflects the same information as existed upon creation of the Service Order.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Applications Being Tested may contain any of the request and payload elements and attributes permitted by the XSDs found in Annex G and F respectively.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | Service Order with the Names.name identifier of SO-36784 , as created in test case SO-1a and modified in test case SO-2, is assumed to exist.  Service Order with the Names.name identifiers of SO-56215, as created in test case SO-1c, is assumed to exist. |
| **Post Condition(s):** | The full and current contents of the subject Service Orders are returned in response to the query. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

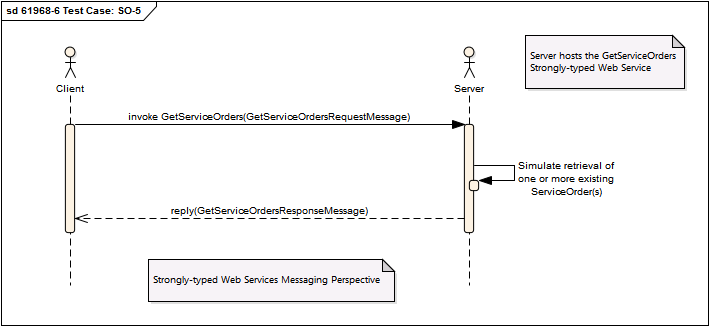


Figure ‑ Sequence Diagram for Test Case SO-5

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Request Message*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | GetServiceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'} |
| **Part 6 XSD** | GetService Orders.xsd  ServiceOrders.xsd | {02-Part 6 XSDs modified by EPRI\'get' Profiles}  {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | GetServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd} |
| **Message Stereotype** | GetServiceOrdersRequestMessage | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:GetServiceOrdersRequestMessage xmlns="http://iec.ch/TC57/2015/GetServiceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/GetServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/GetServiceOrdersMessage GetServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>get</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-08-17T17:33:56-06:00</msg:Timestamp>

<msg:MessageID>b07b3a66-1a56-4227-b61b-a8a733937341</msg:MessageID>

<msg:CorrelationID>dd577705-6dd4-4738-9ea9-18aca6e964af</msg:CorrelationID>

</tns:Header>

<tns:Request>

<GetServiceOrders>

<ServiceOrder>

<Names>

<name>SO-36784</name>

</Names>

</ServiceOrder>

<ServiceOrder>

<Names>

<name>SO-56215</name>

</Names>

</ServiceOrder>

</GetServiceOrders>

<n1:auto-generated\_for\_wildcard/>

</tns:Request>

</tns:GetServiceOrdersRequestMessage>

*Step 2 - Response Message*

**Metadata for Step 2 Message**

|  |  |  |  |
| --- | --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** | |
| **WSDL** | GetServiceOrders.wsdl | | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'} |
| **Part 6 XSD** | ServiceOrders.xsd | | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | GetServiceOrdersMessage.xsd | | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd} |
| **Message Stereotype** | GetServiceOrdersResponseMessage | | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:GetServiceOrdersResponseMessage xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:xml="http://www.w3.org/XML/1998/namespace" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/GetServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/GetServiceOrdersMessage GetServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>reply</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-08-17T17:33:59-06:00</msg:Timestamp>

<msg:MessageID>0ba116d7-fd2b-4f77-bc4e-5ac8ccd43aca</msg:MessageID>

<msg:CorrelationID>dd577705-6dd4-4738-9ea9-18aca6e964af</msg:CorrelationID>

</tns:Header>

<tns:Reply>

<msg:Result>OK</msg:Result>

<msg:Error>

<msg:code>0.0</msg:code>

</msg:Error>

</tns:Reply>

<tns:Payload>

<ServiceOrders>

<ReadingQualityType>

<category>0</category>

<subCategory>0</subCategory>

<systemId>1</systemId>

<Names>

<name>1.0.0</name>

</Names>

</ReadingQualityType>

<ReadingType>

<accumulation>1</accumulation>

<aggregate>0</aggregate>

<commodity>1</commodity>

<consumptionTier>0</consumptionTier>

<cpp>0</cpp>

<currency>0</currency>

<flowDirection>1</flowDirection>

<macroPeriod>0</macroPeriod>

<measurementKind>12</measurementKind>

<measuringPeriod>0</measuringPeriod>

<multiplier>3</multiplier>

<phases>0</phases>

<tou>0</tou>

<unit>72</unit>

<argument>

<denominator>0</denominator>

<numerator>0</numerator>

</argument>

<interharmonic>

<denominator>0</denominator>

<numerator>0</numerator>

</interharmonic>

<Names>

<name>0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0</name>

</Names>

</ReadingType>

<ServiceOrder>

<mRID>65be755c-109f-467a-84ff-9c93fdefeeb7</mRID>

<Names>

<name>SO-36784</name>

<NameType>

<name>Service Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>e1df59f5-c152-4451-b7b4-7c36afd653db</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-08-01T13:20:15-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-29T12:11:40-06:00</requestDateTime>

<statusKind>completed</statusKind>

<type>Meter Exchange</type>

<ActivityRecords>

<createdDateTime>2015-07-29T12:11:40-06:00</createdDateTime>

<reason>Calibration due</reason>

<severity>Normal</severity>

<type>Service Order Created</type>

</ActivityRecords>

<ActivityRecords>

<createdDateTime>2015-08-01T13:20:15-06:00</createdDateTime>

<type>Service Order Completed</type>

</ActivityRecords>

<Appointments>

<callAhead>true</callAhead>

<meetingInterval>

<end>2015-08-01T14:00:00-06:00</end>

<start>2015-08-01T13:00:00-06:00</start>

</meetingInterval>

</Appointments>

<Customers>

<mRID>4bcaa968-2079-4e03-aedd-bf968be4b380</mRID>

<kind>residential</kind>

<CustomerAgreements>

<mRID>237c1efa-c187-4b5d-9ba0-987f8a7c95d8</mRID>

</CustomerAgreements>

<Names>

<name>Michels, Mary</name>

</Names>

</Customers>

<priority>

<justification>Appointment required</justification>

<rank>2</rank>

<type>High</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T14:00:00-06:00</end>

<start>2015-08-01T13:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<TimeSchedules>

<kind>actual</kind>

<scheduleInterval>

<end>2015-08-01T13:21:00-06:00</end>

<start>2015-08-01T13:16:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>f5ce974a-8937-4db8-aa96-e03a358a2799</mRID>

<Hazards>

<type>Dog</type>

</Hazards>

<InternalLocation>

<BuildingName>Residence</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>BSMT</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2204 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2204</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>319</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<localNumber>6538</localNumber>

</phone1>

</WorkLocation>

<WorkTasks>

<mRID>f5ac0622-cc7d-4064-ab3f-bdd53fe0174a</mRID>

<crewETA>2015-08-01T13:00:00-06:00</crewETA>

<instruction>Perform meter exchange</instruction>

<statusKind>completed</statusKind>

<subject>Meter exchange</subject>

<taskKind>exchange</taskKind>

<Assets>

<mRID>aa20d219-0470-4a7f-9655-7fcdd7bdb048</mRID>

<amrSystem>Itron</amrSystem>

<formNumber>2S</formNumber>

<MeterMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</MeterMultipliers>

<MeterReadings>

<Readings>

<reason>installation</reason>

<reportedDateTime>2015-08-01T13:20:10-06:00</reportedDateTime>

<timeStamp>2015-08-01T13:20:10-06:00</timeStamp>

<value>14233</value>

<ReadingQualities>

<timeStamp>2015-08-01T13:20:10-06:00</timeStamp>

<ReadingQualityType ref="1.0.0"/>

</ReadingQualities>

<ReadingType ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</Readings>

</MeterReadings>

<Names>

<name>MTR-98447629</name>

<NameType>

<name>Meter Badge Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Assets>

<Crews>

<mRID>1621e551-fa4c-478a-93ba-8ee2ffc6e073</mRID>

<CrewMembers>

<Person>

<firstName>Gretta</firstName>

<lastName>Nichols</lastName>

</Person>

</CrewMembers>

<Names>

<name>Nichols, Gretta</name>

</Names>

</Crews>

<OldAsset>

<mRID>ff7f1105-434c-419a-b823-a74c97626744</mRID>

<amrSystem>Itron</amrSystem>

<formNumber>2S</formNumber>

<MeterMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</MeterMultipliers>

<MeterReadings>

<Readings>

<reason>removal</reason>

<reportedDateTime>2015-08-01T13:19:18-06:00</reportedDateTime>

<timeStamp>2015-08-01T13:19:18-06:00</timeStamp>

<value>69877</value>

<ReadingQualities>

<timeStamp>2015-08-01T13:19:18-06:00</timeStamp>

<ReadingQualityType ref="1.0.0"/>

</ReadingQualities>

<ReadingType ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</Readings>

</MeterReadings>

<Names>

<name>MTR-22387601</name>

<NameType>

<name>Meter Badge Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</OldAsset>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T14:00:00-06:00</end>

<start>2015-08-01T13:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<TimeSchedules>

<kind>actual</kind>

<scheduleInterval>

<end>2015-08-01T13:21:00-06:00</end>

<start>2015-08-01T13:16:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<UsagePoint>

<mRID>b0f46cbf-5315-44f8-b116-3e98ace55066</mRID>

<connectionState>connected</connectionState>

<isSdp>true</isSdp>

<nominalServiceVoltage>240</nominalServiceVoltage>

<ratedCurrent>200</ratedCurrent>

<serviceDeliveryRemark>Call ahead for access to basement</serviceDeliveryRemark>

<MetrologyRequirements>

<mRID>48c5068e-5b46-4ecf-9d06-db6ab9ace3f5</mRID>

<ReadingTypes ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</MetrologyRequirements>

<ServiceCategory>

<kind>electricity</kind>

</ServiceCategory>

<ServiceMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</ServiceMultipliers>

<UsagePointLocation>

<mRID>7fe651da-e9f5-4687-9ac9-ba5223f02c65</mRID>

<remark>Call ahead for access</remark>

<siteAccessProblem>Basement location</siteAccessProblem>

<InternalLocation>

<BuildingName>Residence</BuildingName>

<BuildingNumber>1</BuildingNumber>

<Floor>BSMT</Floor>

<RoomNumber>1</RoomNumber>

</InternalLocation>

<mainAddress>

<streetDetail>

<addressGeneral>2204 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2204</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</UsagePointLocation>

</UsagePoint>

</WorkTasks>

</Work>

</ServiceOrder>

<ServiceOrder>

<mRID>fd6b6141-c5ff-48ab-b5e5-7348292098c1</mRID>

<Names>

<name>SO-56215</name>

<NameType>

<name>Service Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>ec6a4b6c-716e-4c3b-8607-b316615f8348</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-29T13:14:05-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-29T13:14:05-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<type>Meter Exchange</type>

<ActivityRecords>

<createdDateTime>2015-07-29T13:14:05-06:00</createdDateTime>

<reason>Calibration due</reason>

<severity>Normal</severity>

<type>Service Order Created</type>

</ActivityRecords>

<Appointments>

<callAhead>true</callAhead>

<meetingInterval>

<end>2015-08-01T16:00:00-06:00</end>

<start>2015-08-01T15:00:00-06:00</start>

</meetingInterval>

</Appointments>

<Customers>

<mRID>2895e1b7-e0e9-4d99-880c-e5c7c6f6fe3a</mRID>

<kind>residential</kind>

<CustomerAgreements>

<mRID>96404301-b5f9-4229-b794-8101edbf83fd</mRID>

</CustomerAgreements>

<Names>

<name>Kline, Gerald</name>

</Names>

</Customers>

<priority>

<justification>Appointment required</justification>

<rank>2</rank>

<type>High</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T16:00:00-06:00</end>

<start>2015-08-01T15:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>fd3e6dc1-4a30-4108-9f75-e730b9b52faa</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>2208 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2208</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>319</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<localNumber>9924</localNumber>

</phone1>

</WorkLocation>

<WorkTasks>

<mRID>7d01c6b4-a532-4824-9305-da97717bacf2</mRID>

<crewETA>2015-08-01T15:00:00-06:00</crewETA>

<instruction>Perform meter exchange</instruction>

<statusKind>scheduled</statusKind>

<subject>Meter exchange</subject>

<taskKind>exchange</taskKind>

<Crews>

<mRID>1621e551-fa4c-478a-93ba-8ee2ffc6e073</mRID>

<CrewMembers>

<Person>

<firstName>Gretta</firstName>

<lastName>Nichols</lastName>

</Person>

</CrewMembers>

<Names>

<name>Nichols, Gretta</name>

</Names>

</Crews>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-01T16:00:00-06:00</end>

<start>2015-08-01T15:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<UsagePoint>

<mRID>ef856c2d-26d6-4491-9bcf-aad4fca20078</mRID>

<connectionState>connected</connectionState>

<isSdp>true</isSdp>

<nominalServiceVoltage>240</nominalServiceVoltage>

<ratedCurrent>200</ratedCurrent>

<MetrologyRequirements>

<mRID>48c5068e-5b46-4ecf-9d06-db6ab9ace3f5</mRID>

<ReadingTypes ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</MetrologyRequirements>

<ServiceCategory>

<kind>electricity</kind>

</ServiceCategory>

<ServiceMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</ServiceMultipliers>

<UsagePointLocation>

<mRID>476fc26a-53d8-4510-8b0a-436a1859ab57</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>2208 Elm St NE, Cedar Rapids, IA 52402</addressGeneral>

<name>Elm</name>

<number>2208</number>

<suffix>NE</suffix>

<type>St</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52402</code>

<country>USA</country>

<name>Cedar Rapids</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

</UsagePointLocation>

</UsagePoint>

</WorkTasks>

</Work>

</ServiceOrder>

</ServiceOrders>

</tns:Payload>

</tns:GetServiceOrdersResponseMessage>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Get Service Orders | http://xx.xxx.xxx.xxx/ | change | ServiceOrders |  |
| 2 | Success Response | http://xx.xxx.xxx.xxx/ | reply | ServiceOrders |  |

## SO-6: Server informs Client of the creation of Service Orders (Two Service Orders in a single message)

In this test case, the Server informs the Client of the creation of two Service Orders. Such a notification may occur if the Client is not the original requestor, but instead is being notified of the Sevice Orders instantiated directly within the Server or as a result of a request by a third system. The notification may occur immediately upon instantiation or at some later date/time. This is an asynchronous notification using an Event Stereotype message. There is no response message.

If the Server were in fact a true Work Management System (WMS), then upon success of this messaging interchange, the Service Orders would be known to the WMS and could be subsequently changed or deleted. Subsequent test cases in this document will assume the persistence of specific Work Requests, Maintenance Orders, and Service Orders and refer to them by the mRIDs and/or Names assigned in the "created" test cases. See the Preconditions section of subsequent test cases for additional information.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | It is assumed that Service Orders SO-24255 and SO-24256 were created at different times earlier in the day. |
| **Post Condition(s):** | The Client is informed of the details of two Service Orders created earlier in the day. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

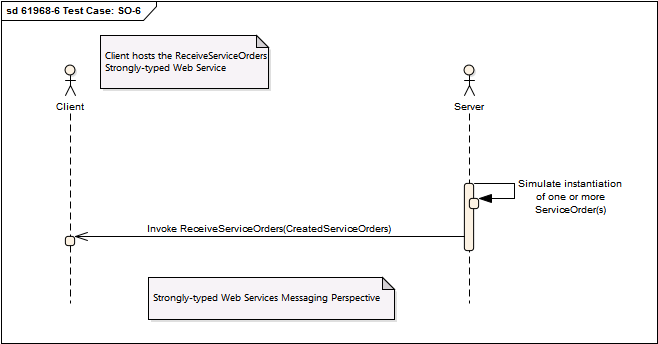


Figure ‑ Sequence Diagram for Test Case SO-6

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveServiceOrders.wsdl | 03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd} |
| **Message Stereotype** | CreatedServiceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:CreatedServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>created</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-29T20:00:03-06:00</msg:Timestamp>

<msg:MessageID>254287fd-84e8-4e8a-9c24-a1e0ba75c588</msg:MessageID>

</tns:Header>

<tns:Payload>

<ServiceOrders>

<ServiceOrder>

<mRID>eec501b8-b41d-4968-9794-60a6c0afb677</mRID>

<Names>

<name>SO-76677</name>

<NameType>

<name>Service Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>47eb318b-ce72-4339-8894-d2c0b95f7667</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-29T18:45:01-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-29T18:45:01-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<type>Meter Exchange</type>

<ActivityRecords>

<createdDateTime>2015-07-29T18:45:01-06:00</createdDateTime>

<reason>Calibration due</reason>

<severity>Normal</severity>

<type>Service Order Created</type>

</ActivityRecords>

<Customers>

<mRID>21ad34ee-2b6a-428c-b39d-d5511e3afe6c</mRID>

<kind>residentialAndCommercial</kind>

<CustomerAgreements>

<mRID>3603ebc9-0c74-4677-89aa-3339d15bce7e</mRID>

</CustomerAgreements>

</Customers>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-04T16:30:00-06:00</end>

<start>2015-08-04T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>804197a1-369c-4b5a-8da0-e7e2cc614058</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>501 Hunter Av, Hiawatha, IA 52233</addressGeneral>

<name>Hunter</name>

<number>501</number>

<suiteNumber>101</suiteNumber>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52233</code>

<country>USA</country>

<name>Hiawatha</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>319</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<localNumber>2888</localNumber>

</phone1>

</WorkLocation>

<WorkTasks>

<mRID>ca5e95f0-d8b6-443b-b394-7d4ccf4d857d</mRID>

<instruction>Perform meter exchange</instruction>

<statusKind>scheduled</statusKind>

<subject>Meter Exchange</subject>

<taskKind>exchange</taskKind>

<UsagePoint>

<mRID>801a43d1-e6fd-4567-8931-c210d6cb9a03</mRID>

<nominalServiceVoltage>480</nominalServiceVoltage>

<phaseCode>ABCN</phaseCode>

<ratedCurrent>1200</ratedCurrent>

<Names>

<name>UP-98767554</name>

<NameType>

<name>Usage Point ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<ServiceCategory>

<kind>electricity</kind>

</ServiceCategory>

<ServiceMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</ServiceMultipliers>

</UsagePoint>

</WorkTasks>

</Work>

</ServiceOrder>

<ServiceOrder>

<mRID>f7835b5a-665c-4585-b54b-3545d88e4e97</mRID>

<Names>

<name>SO-76678</name>

<NameType>

<name>Service Order Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<Work>

<mRID>f7835b5a-665c-4585-b54b-3545d88e4e97</mRID>

<kind>service</kind>

<lastModifiedDateTime>2015-07-29T18:45:02-06:00</lastModifiedDateTime>

<requestDateTime>2015-07-29T18:45:02-06:00</requestDateTime>

<statusKind>scheduled</statusKind>

<type>Meter Exchange</type>

<ActivityRecords>

<createdDateTime>2015-07-29T18:45:02-06:00</createdDateTime>

<reason>Calibration due</reason>

<severity>Normal</severity>

<type>Service Order Created</type>

</ActivityRecords>

<Customers>

<mRID>ca60e745-a211-4a6a-bb38-b3ca460a6841</mRID>

<kind>residentialAndCommercial</kind>

<CustomerAgreements>

<mRID>dcc9b7ae-c2b2-4c0c-b752-8ab028e06dfd</mRID>

</CustomerAgreements>

</Customers>

<priority>

<rank>3</rank>

<type>Normal</type>

</priority>

<TimeSchedules>

<kind>request</kind>

<scheduleInterval>

<end>2015-08-04T16:30:00-06:00</end>

<start>2015-08-04T08:00:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkLocation>

<mRID>743bd16b-a18a-47bf-bb91-dcec9603cf52</mRID>

<mainAddress>

<streetDetail>

<addressGeneral>501 Hunter Av, Hiawatha, IA 52233</addressGeneral>

<name>Hunter</name>

<number>501</number>

<suiteNumber>102</suiteNumber>

<type>Av</type>

<withinTownLimits>true</withinTownLimits>

</streetDetail>

<townDetail>

<code>52233</code>

<country>USA</country>

<name>Hiawatha</name>

<stateOrProvince>IA</stateOrProvince>

</townDetail>

</mainAddress>

<phone1>

<areaCode>319</areaCode>

<cityCode>555</cityCode>

<countryCode>1</countryCode>

<extension>4</extension>

<localNumber>2433</localNumber>

</phone1>

</WorkLocation>

<WorkTasks>

<mRID>0c3e51b1-f6f6-423b-8d8e-b6b78748b583</mRID>

<instruction>Perform meter exchange</instruction>

<statusKind>scheduled</statusKind>

<subject>Meter Exchange</subject>

<taskKind>exchange</taskKind>

<UsagePoint>

<mRID>a5912b52-0dae-46d8-bec9-a182cdc1d2bd</mRID>

<nominalServiceVoltage>480</nominalServiceVoltage>

<phaseCode>ABCN</phaseCode>

<ratedCurrent>2200</ratedCurrent>

<Names>

<name>UP-9855432</name>

<NameType>

<name>Usage Point ID</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

<ServiceCategory>

<kind>electricity</kind>

</ServiceCategory>

<ServiceMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</ServiceMultipliers>

</UsagePoint>

</WorkTasks>

</Work>

</ServiceOrder>

</ServiceOrders>

</tns:Payload>

</tns:CreatedServiceOrders>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Created Service Orders Notification | http://xx.xxx.xxx.xxx/ | created | ServiceOrders |  |

## SO-7: Server informs Client of modification of an existing Service Order (Completion of Service Order)

In this test case, the Server informs the Client of the completion of a Service Order. Such a notification may occur if the Client is not the original requestor of the change, but instead is being notified of the change made directly within the Server or as a result of a request by a third system. The notification may occur immediately at the time of the change or at some later date/time. This is an asynchronous notification using an Event Stereotype message. There is no response message.

Contrary to the simple modification of a Work Request illustrated in test case WR-7 and of a Maintenance Order illustrated in test case MO-7, this test case illustrates an extensive update associated with completing the Service Order and capturing the final reading of the removed meter (OldAsset) and the initial reading of the installed meter (New Asset).

In this test case, Service Order SO-76677 was previously created.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Service Order with a Names.name identifier of SO-76677, as created in test case SO-6, is assumed to exist. |
| **Post Condition(s):** | The Client is informed that the subject Service Order has been modified. The payload reflects the completion details including the meter readings and asset information. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

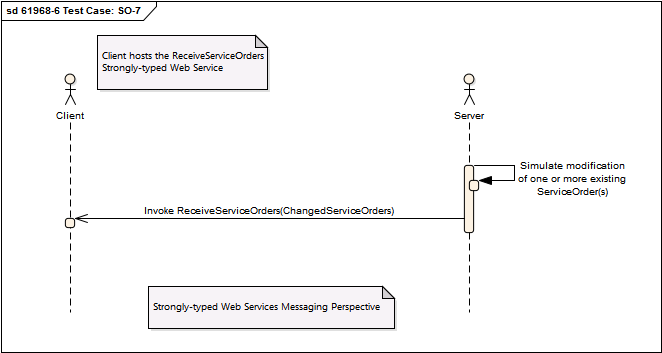


Figure ‑ Sequence Diagram for Test Case SO-7

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveServiceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ChangedServiceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ChangedServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>changed</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-08-04T18:30:00-06:00</msg:Timestamp>

<msg:MessageID>1aa50616-f922-4417-861b-f8aaee63a800</msg:MessageID>

</tns:Header>

<tns:Payload>

<ServiceOrders>

<ServiceOrder>

<Names>

<name>SO-76677</name>

</Names>

<Work>

<mRID>47eb318b-ce72-4339-8894-d2c0b95f7667</mRID>

<lastModifiedDateTime>2015-08-04T14:46:17-06:00</lastModifiedDateTime>

<requestDateTime>2001-12-17T09:30:47Z</requestDateTime>

<statusKind>completed</statusKind>

<ActivityRecords>

<createdDateTime>2015-08-04T14:46:17-06:00</createdDateTime>

<type>Service Order Completed</type>

</ActivityRecords>

<TimeSchedules>

<kind>actual</kind>

<scheduleInterval>

<end>2015-08-04T14:30:00-06:00</end>

<start>2015-08-04T14:50:00-06:00</start>

</scheduleInterval>

</TimeSchedules>

<WorkTasks>

<mRID>ca5e95f0-d8b6-443b-b394-7d4ccf4d857d</mRID>

<statusKind>completed</statusKind>

<Assets>

<mRID>5dd1d75f-3a03-4369-860d-e2afba0ab54d</mRID>

<amrSystem>Itron</amrSystem>

<formNumber>2S</formNumber>

<MeterMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</MeterMultipliers>

<MeterReadings>

<Readings>

<reason>installation</reason>

<reportedDateTime>2015-08-04T14:44:22-06:00</reportedDateTime>

<timeStamp>2015-08-04T14:44:22-06:00</timeStamp>

<value>767453</value>

<ReadingQualities>

<timeStamp>2015-08-04T14:44:22-06:00</timeStamp>

<ReadingQualityType ref="1.0.0"/>

</ReadingQualities>

<ReadingType ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</Readings>

</MeterReadings>

<Names>

<name>MTR-0099988765</name>

<NameType>

<name>Meter Badge Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</Assets>

<OldAsset>

<mRID>49f2e134-7c3a-4006-a735-1ff7ccc76c38</mRID>

<amrSystem>Itron</amrSystem>

<formNumber>2S</formNumber>

<MeterMultipliers>

<kind>transformerRatio</kind>

<value>1.0</value>

</MeterMultipliers>

<MeterReadings>

<Readings>

<reason>installation</reason>

<reportedDateTime>2015-08-04T14:43:02-06:00</reportedDateTime>

<timeStamp>2015-08-04T14:43:02-06:00</timeStamp>

<value>334532</value>

<ReadingQualities>

<timeStamp>2015-08-04T14:43:02-06:00</timeStamp>

<ReadingQualityType ref="1.0.0"/>

</ReadingQualities>

<ReadingType ref="0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0"/>

</Readings>

</MeterReadings>

<Names>

<name>MTR-017765435</name>

<NameType>

<name>Meter Badge Number</name>

<NameTypeAuthority>

<name>Utility XYZ</name>

</NameTypeAuthority>

</NameType>

</Names>

</OldAsset>

</WorkTasks>

</Work>

</ServiceOrder>

</ServiceOrders>

</tns:Payload>

</tns:ChangedServiceOrders>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Changed Service Order Notification | http://xx.xxx.xxx.xxx/ | changed | ServiceOrders |  |

## SO-8: Server informs Client of modification of an existing Service Order (Deletion of an attribute)

In this test case, the Server informs the Client of the deletion of an extension from the phone number of the Work Location for a Service Order. This is an asynchronous notification using an Event Stereotype message. There is no response message.

***IMPORTANT: Because the intent is to remove an existing element (phone extension), it is necessary to leverage the OperationSet technique. Please refer to the subsection entitled 61968 Part 100 Considerations in Section 2 and Annex D for a more complete discussion concerning the use of OperationSets to accomplish the deletion of attributes and/or association classes. A phone extension is an example of an attribute.***

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, Service Order SO-76678 was previously created with a phone extension of 4 for the Work Location.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Service Order with a Names.name identifier of SO-76678 and a phone extension of 4 for the Work Location, as created in test case SO-6, is assumed to exist. |
| **Post Condition(s):** | The Client is informed that the subject Service Order has been modified to delete the phone extension. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

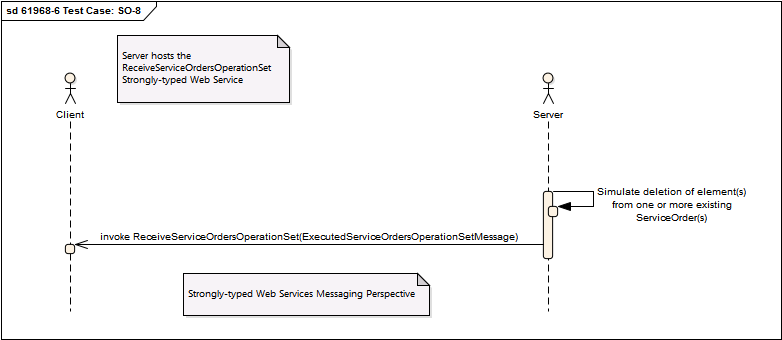


Figure ‑ Sequence Diagram for Test Case SO-8

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveServiceOrdersOperationSet.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | ServiceOrdersOperationSetMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | ExecutedServiceOrdersOperationSet | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:ExecutedServiceOrdersOperationSet xmlns="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersOperationSetMessage" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersOperationSetMessage ServiceOrdersOperationSetMessage.xsd">

<tns:Header>

<Verb>executed</Verb>

<Noun>OperationSet</Noun>

<Timestamp>2015-07-30T10:46:23-06:00</Timestamp>

<MessageID>f1e8c015-d424-4d63-a188-39dc2238b0e1</MessageID>

</tns:Header>

<tns:Payload>

<tns:OperationSet>

<Operation>

<operationId>1</operationId>

<noun>ServiceOrders</noun>

<verb>deleted</verb>

<elementOperation>true</elementOperation>

<ServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrders# ServiceOrders.xsd">

<ServiceOrder>

<Names>

<name>SO-76678</name>

</Names>

<Work>

<mRID>f7835b5a-665c-4585-b54b-3545d88e4e97</mRID>

<WorkLocation>

<mRID>743bd16b-a18a-47bf-bb91-dcec9603cf52</mRID>

<phone1>

<extension>4</extension>

</phone1>

</WorkLocation>

</Work>

</ServiceOrder>

</ServiceOrders>

</Operation>

</tns:OperationSet>

</tns:Payload>

</tns:ExecutedServiceOrdersOperationSet>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Deleted Details from existing Service Order Notification | http://xx.xxx.xxx.xxx/ | executed | OperationSet\* |  |

\*The OperationSet includes a single Operation having:

* verb = "deleted"
* noun = "ServiceOrders"
* elementOperation = "true"

## SO-9: Server informs Client of the deletion of an existing Service Order

In this test case, the Server informs the Client of the deletion of an existing Service Order. This is an asynchronous notification using an Event Stereotype message. There is no response message.

The examples in this and other test cases illustrate the population of an exemplary subset of elements and attributes selected solely for illustrative purposes. Actual messages created by the Client and Server applications may contain any of the elements and attributes permitted by the XSDs found in Annexes C, F, and G.

In this test case, Service Order SO-76678, which was previously created, is deleted.

|  |  |
| --- | --- |
| **Pre-Condition(s)** | A Service Order with a Names.name identifier of SO-76788, as created in test case SO-6, is assumed to exist. |
| **Post Condition(s):** | The Client is informed that the subject Service Order has been deleted. |

The following Sequence Diagram and sample XML illustrate the mesaging interaction for this test case using IEC 61968 CIM terminology that would evident in messages being transported via "Strongly-typed Web Services as defined in IEC 61968 Part 100.

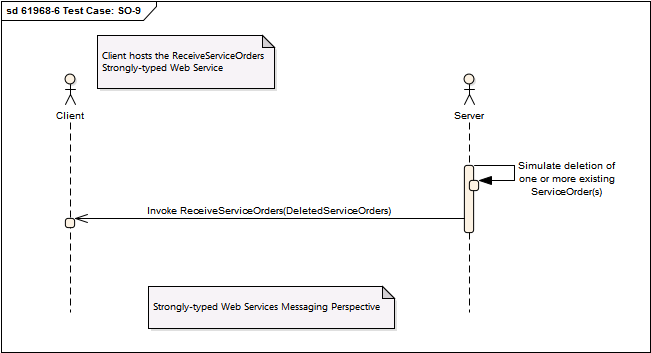


Figure ‑ Sequence Diagram for Test Case SO-9

Sample XML for the Strongly-typed Web Services variant of this test case is as follows. Client and Server applications being tested in accordance with this test case are permitted to populate the create request message with any content that can be validated using the message envelope (61968 Part 100) and CIM Object (IEC 61968 Part 6) XSD profiles provided in this document.

*Step 1 - Event Message (Notification Message)*

**Metadata for Step 1 Message**

|  |  |  |
| --- | --- | --- |
| **Artifact** | **Name** | **Location in Supplemental Resource File** |
| **WSDL** | ReceiveServiceOrders.wsdl | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'} |
| **Part 6 XSD** | Service Orders.xsd | {02-Part 6 XSDs modified by EPRI\'change or delete' Profiles} |
| **Strongly-Typed Message XSD** | ServiceOrdersMessage.xsd | {03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd} |
| **Message Stereotype** | DeletedServiceOrders | n/a |

<?xml version="1.0" encoding="UTF-8"?>

<!--Sample XML file generated by XMLSpy v2015 rel. 4 sp1 (x64) (http://www.altova.com)-->

<tns:DeletedServiceOrders xmlns="http://iec.ch/TC57/2015/ServiceOrders#" xmlns:msg="http://iec.ch/TC57/2011/schema/message" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:tns="http://iec.ch/TC57/2015/ServiceOrdersMessage" xmlns:n1="http://www.altova.com/samplexml/other-namespace" xsi:schemaLocation="http://iec.ch/TC57/2015/ServiceOrdersMessage ServiceOrdersMessage.xsd">

<tns:Header>

<msg:Verb>deleted</msg:Verb>

<msg:Noun>ServiceOrders</msg:Noun>

<msg:Timestamp>2015-07-30T11:20:41-06:00</msg:Timestamp>

<msg:MessageID>6efc6425-4bdc-4c63-8a47-5c0874237e8e</msg:MessageID>

</tns:Header>

<tns:Payload>

<ServiceOrders>

<ServiceOrder>

<Names>

<name>SO-76678</name>

</Names>

</ServiceOrder>

</ServiceOrders>

</tns:Payload>

</tns:DeletedServiceOrders>

**Test Results**

Application Being Tested:  Client Role  Server Role

EPRI Test Harness:  Client Role  Server Role

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Function** | **End Point** | **Verb** | **Noun** | **Pass / Fail** |
| 1 | Deleted Details from existing Service Order Notification | http://xx.xxx.xxx.xxx/ | deleted | ServiceOrders |  |

###### References

While the test harness and test procedures will be updated to accommodate these tests, for an understanding of the prior work that has been accomplished, the EPRI report, Common Information Model (CIM) Conformity and Interoperability Test Procedure Development, particularly the annexes that describe the Test Harness setup, are informative.

Available [Online] <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001024448>

The CIM-based messages leverage the verb-object naming convention and follow the integration guidance based on IEC 61968-100 Application Integration at electric utilities. This international standard is available from the IEC store.

Available [Online]

<https://webstore.iec.ch/publication/6198>

The use case patterns that describes how to remove an association between an element and a parent object are described in detail in IEC 61968-9 Meter Reading and Control 2nd Edition, Annex L.

Available [Online]

<https://webstore.iec.ch/publication/6204>

The original open source code for the test harness is available at SourceForge.

Available [Online]

<http://usstestharness.sourceforge.net/>

###### Contents of supplemental Resources file

A zip file of supplemental resources Associated with this Test Script document is is available from EPRI. The contents of this zip file are described here. In addition, various locations within this zip file are referenced throughout this Test Script document.

Here is a description of the contents in each of the sub-folders:

**01-Part 6 Original FDIS XSDs**

This subdirectory contains the WorkRequests, MaintenanceOrders, and ServiceOrders XSDs (profiles) exactly as they appeared in the Part 6 FDIS. These files are not to be used for the EPRI-sponsored Part 6 testing, but are included here for reference and traceability. Instead, the modified XSDs (see subdirectory 02) that incorporate new root elements, support for InternalLocation, and bug fixes will be used for the testing.

**02-Part 6 XSDs modified by EPRI**

This subdirectory contains 3 sub-subdirectories that have the EPRI-modified WorkRequests, MaintenanceOrders, and ServiceOrders XSDs that incorporate new root elements, support for InternalLocation, and bug fixes. Also included are the EPRI-generated "get" profiles for the three types of request/order. These profiles are used in connection with the strongly-typed artifacts in subdirectory 03.

The **first sub-subdirectory ('change or delete' Profiles)** contains "unconstrained" XSDs that have most elements as optional - these need the high level of optionality to support use with "change" and "delete" CIM verbs.

The **second sub-subdirectory ('create' Profiles)** contains in turn another subdirectory entitled "Constrained by EPRI". This folder contains "constrained" XSDs that have selected elements as optional - these are intended for use when the CIM verb is "create". Even these XSDs have a high percentage of optional elements to support create scenarios where only skeleton information is known at create time and additional details are added later using the "change" verb.

The **third sub-subdirectory ('get' Profiles)** contains EPRI-generated GetWorkRequests, GetMaintenanceOrders, and GetServiceOrders XSDs for use with the CIM verb "get". These XSDs are patterened after the "get" profiles in IEC 61968 Part 9, and serve to specify the "query parameters" when requesting the details of one or more Work Requests, MaintenanceOrders, or ServiceOrders. Please note that these "get" XSDs appear in the Request section of a Part 100 message envelope; this is contrasted to the non-get XSDs that appear in the Payload section of the Part 100 message envelope.

**03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI**

This subdirectory contains 3 sub-subdirectories that have the EPRI-generated strongly-typed XSDs and WSDLs that will be used in the EPRI-sponsored Part 6 testing. The procedures for generating these artifacts are found in and/or derived from the instructions in Annex C of IEC 61968 Part 100.

The **first sub-subdirectory (Messages and WSDLs for 'change or delete')** contains the actual WSDLs to be used in the EPRI-sponsored part 6 testing. There is a WSDL for each unique combination of:

* two service types (Execute and Receive)
* three Part 6 profiles (WorkRequests, MaintenanceOrders, and ServiceOrders)
* messages not requiring / requiring OperationSet .

Execute is used for request/reply message interactions. Receive is used for uni-directional event stereotype messages. OperationSet is used to support deleting attributes or association classes from a WorkRequest, MaintenanceOrder, or ServiceOrder.

These WSDLs were created using the methodology in Annex C of IEC 61968 Part 100 and were further constrained to support only the "change", "changed", and "delete" and "deleted" CIM verbs as appropriate based on the service type. The "change" and "delete verbs are used for request/reply messages (Execute) and the "changed" and "deleted" verbs are used for uni-directional event stereotype messages (Receive).

Under this first sub-subdirectory is a folder called **"WSDL Templates"**. This contains templates that are used to create the actual WSDLs using instructions contained in or derived from Annex C of IEC 61968 Part 100. These are included for reference only as the material in Part 100 has some errors and is not sufficient to handle OperationSets. This folder contains a WSDL Template for each unique combination of:

* two service types (Request\_Execute and Send\_Receive\_Reply)
* messages not requiring / requiring OperationSet .

Also under the first sub-subdirectory is a folder called "xsd". This folder contains various files that are referenced by the various WSDLs at the subdirectory level. In order for the WSDLs to validate, the files in the "xsd" folder must be present. This folder contains 3 basic types of files, including:

* The Part 100 Message.xsd and supporting files that constitute the Part 100 message envelope.
* The "unconstrained" EPRI-modified Part 6 XSDs for use with "change" or "delete" verbs (see subdirectory "02-Part 6 XSDs modified by Chris")
* The strongly-typed Message XSDs that are created using procedures contained in or derived from Annex C of IEC 61968 Part 100. These files are:
  + WorkRequestsMessage.xsd
  + WorkRequestsOperationSetMessage.xsd
  + MaintenanceOrdersMessage.xsd
  + MaintenanceOrdersOperationSetMessage.xsd
  + ServiceOrdersMessage.xsd
  + ServiceOrdersOperationSetMessage.xsd

Each of these XSDs includes elements of both the Part 100 and the specific Part 6 Payload XSD (WorkRequests, Maintenance Orders, and ServiceOrders).

Under the "xsd" folder is another folder entitled "XSD Templates". This contains the template that is used to create the actual strongly-typed Message XSDs listed above using instructions contained in or derived from Annex C of IEC 61968 Part 100. These are included for reference only as the material in Part 100 has some errors and is not sufficient to handle OperationSets.

The **second sub-subdirectory (Messages and WSDLs for 'create')** is essentially the same as the first sub-subdirectory with the following exceptions:

* The WSDLs are constrained to support only the "create" and "created" CIM verbs.
* The underlying WorkRequests.xsd, MaintenanceOrders.xsd and ServiceOrders.xsd in the "xsd" folder are the "constrained" versions for use in with "create" and "created" verbs
* OperationSets are not used (in the EPRI-sponsored Part 6 testing) in conjunction with "create" and "created" verbs.

The **third sub-subdirectory (Messages and WSDLs for 'get')** is essentially the same as the first sub-subdirectory with the following exceptions:

* The WSDLs are constrained to support only the "get" CIM verbs.
* Only the Execute service is used (Receive and the event stereotype messaging is not used in "get" scenarios.
* OperationSets are not used (in the EPRI-sponsored Part 6 testing) in conjunction with the "get" verb.

**04-Part 6 Sample XML**

This subdirectory contains a selection of Sample XML that has been created to support this Test Script document. There are three sub-subdirectories, one for CIM verb "create" (using the "constrained" version of the corresponding Part 6 profile), one for the CIM verbs "change" and "delete" (using the "unconstrained version of the corresponding Part 6 profile), and one for the CIM verb "get".

###### IEC 61968 Part 100 message profile (Message.xsd)

IEC 61968-100 provides a normative Message.xsd that serves as an application-level message envelope for sending and receiving the content of profiles associated with IEC 61968-6 as well as other IEC 61968-series standards.

The content of this Test Script document and all specifix examples within are based upon the normative IEC 61968-100 Message.xsd with no changes. *(Notwithstanding this, implementations involving strongly-typed Web Services will use XSDs that are derived from the normative Part 100 Message.xsd and the EPRI-generated Part 6 XSDs. The rules for generating these derived XSDs are specified in Annex C of IEC 61968-100.)*

The remainder of this Annex discusses and illustrates key considerations concerning the use of Message.xsd. As shown in Figure C-1, IEC 61968-9 CIM-compliant messages have a specified message structure, with separate packages consisting of:

* Header for message control information
* Request for inclusion of request-specific parameters
* Reply for inclusion of response codes and any encountered error conditions
* Payload for conveying message data

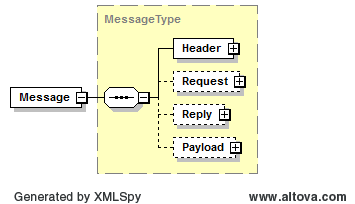


Figure C‑1 CIM-compliant Message Format

The CIM header includes a CIM verb and a CIM Noun. The message payloads are conveyed using pre-defined message structures (XSDs) that are refered to as “profiles”, with the name of the profile also serving as the CIM noun.

As an example of verb and noun usage, consider that an unsolicited (meaning a notification as opposed to a request/response integrationpattern) Work Request could be conveyed from one system to another using a “created WorkRequests” message, with the CIM verb being ‘created” and the CIM Noun (payload) being “WorkRequests”. It would also be said that this transaction utilized the WorkRequests profile.

There are approximately 14 commonly used verbs defined in the IEC 61968-100 standard. All verbs are specified as lower-case. The subset of the Part 100 verbs used in this Test Script document, along with their IEC definitions, is as follows. Please note that the IEC definitions may appear intimidating; the Test Cases in this document will help to clarify the usage of these verbs

| Verb | Meaning |
| --- | --- |
| create | The ‘create’ verb is used to publish a request to the master system to create a new object. The master system may in turn publish the new object as an event using the verb ‘created’.  The master system may also use the verb ‘reply’ to respond to the ‘create’ request, indicating whether the request has been processed successfully or not. |
| created | The ‘created’ verb is used to publish an event that is a notification of the creation of a object as a result of either an external request or an internal action within the master system of that object. This message type is usually subscribed to by interested systems and could be used for mass updates. There is no need to reply to this message type. |
| change | The ‘change’ verb is used to publish a request to the master system to make a change to an object based on the information in the message. The master system may in turn publish the changed object as an event using the verb ‘changed’ to notify that the object has been changed since last published. The master system may also use the verb ‘reply’ to respond to the ‘change’ request, indicating whether the request has been processed successfully or not. |
| changed | The ‘changed’ verb is used to publish an event that is a notification of the change of an object as a result of either an external request or an internal action within the master system of that object. This could be a generic change in the content of the object or a specific status change such as “approved”,  “issued” etc. This message type is usually subscribed to by interested systems and could be used for mass updates. There is no need to reply to this message type. |
| delete | The ‘delete’ verb is used to publish a request to the master system to delete one or more objects. The master system may in turn publish the deleted object as an event using the verb ‘deleted’ to notify that the object has been deleted since last published. The master system may also use the verb ‘reply’ to respond to the ‘delete’ request, indicating whether the request has been processed successfully or not. The ‘delete’ verb is used when the business object should no longer be kept in the integrated systems either due to error(s) or due to archiving needs. However, the master system will most likely retain a historical record of the object after deletion. |
| deleted | The ‘deleted’ verb is used to publish an event that is a notification of the deletion of an object as a result of either an external request or an internal action within the master system of that object. This message type is usually subscribed to by interested systems and could be used for mass updates. Thereis no need to reply to this message type. |
| execute | The ‘execute’ verb is used when the message is conveying a complex transaction that involves a variety of create, delete and/or change operations through the use of the Payload.OperationSet element. |
| executed | The ‘executed’ verb is used to publish an event that indicates the execution of a complex transaction that uses the Payload.OperationSet element. |
| get | The ‘get’ verb is used to issue a query request to the master system to return a set of zero or more objects that meet a specified criteria. The master system may in turn return zero or more objects using the ‘reply’ verb in a response message. |
| reply | There are two primary usages of the ‘reply’ verb, but in both cases it is only used in response to request messages, whether the pattern used is synchronous or asynchronous. The first usage is to indicate the success, partial success or failure of a transactional request to the master system to create, change, delete, cancel, or close a document. The second usage is in response to a ‘get’ request, where objects of interest may be returned in the response. |

There are four message stereotypes defined in IEC 61968-100. The stereotypes are defined as follows:

|  |  |
| --- | --- |
| **Message Stereotype** | **Description** |
| RequestMessage | Sent from a client system to a server system to request a service from the server system |
| ResponseMessage | Sent from a server system to a client system to respond to a request for a service |
| EventMessage | Broadcast from a system to inform other systems in an unsolicited fashion the occurrence of an event or the publication of data |
| FaultMessage | Sent from a server system to a client system to inform the client that its prior request for a service resulted in a high-level fault condition  The FaultMessage is intended to be used as a response of last resort, typically informing a client system that a request was received but was corrupted in such a fashion that not even message-level structures were parseable. For this reason, the Header and Payload are deliberately removed from this particular message stereotype. |

The definitions of the stereotypes are illustrated in Figures C-2 through C-5. Required elements are shown with solid borders; optional elements (wherer the presence or absense is dependend upon the business intent of the message) are shown with dashed borders.

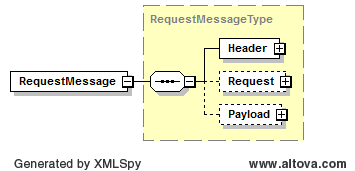


Figure C-2 RequestMessage Stereotype

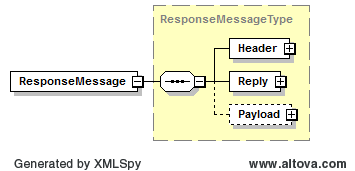


Figure C-3 ResponseMessage Stereotype

FaultMessage

Figure C-4 FaultMessage Stereotype

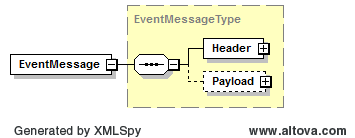


Figure C-5 EventMessage Stereotype

As noted, messages are comprised of four main components, which are described in detail below:

| **Message Component** | **Description** |
| --- | --- |
| Header (HeaderType) | The Header is common to all message stereotypes except the FaultMessage. It is used to convey message-level control information. The Verb and Noun are the only elements prescribed as mandatory by the XML schema definition; however other elements are also procedurally prescribed as mandatory by this interface specification.  For specific guidance on how to populate the Header elements, please consult the appropriate Messaging Guideline document referenced in Section 12 for the specific use case being implemented. |
| Request (RequestType) | The Request structure is used in RequestMessage and EventMessage to provide filtering criteria or other request-oriented parameters.  The XML:any element in the RequestType is intended to provide a loosely-coupled means for including structured request parameters that are specific to the Noun found in the Header. The GetMeterReadings structure (defined later in Section 11) is a typical structure that will be contained in this XML:any element. |
| Reply (ReplyType) | The Reply structure is used in ResponseMessage and FaultMessage to provide reply-oriented feedback to the requestor.  Typical use of the Reply structure in the ResponseMessage is to acknowledge to the requestor any error conditions (or lack thereof) encountered in the processing of the request.  Typical use of the Reply structure in the FaultMessage is to communicate to the requestor any higher-level error conditions encountered that prevented the processing of the request. |
| Payload (PayloadType) | The Payload structure is common to RequestMessage, ResponseMessage and EventMessage. It is used to encapsulate the details of the requests, responses or events that are being communicated.  The payload element is loosely typed as an XML any: type, so that any number of formats and structures can be contained.  There are provisions in the PayloadType for compressing the payload structure if message size limitations are a concern. As well, the definition provides the ability to specify the format of the payload, if non-XML formats are desired. |

The definitions of each of the complex types are illustrated in Figures C-6 through C-10.

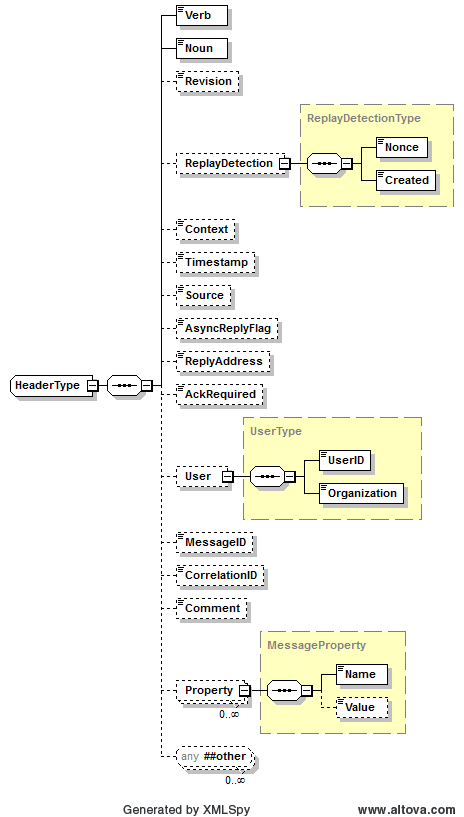


Figure C-6 Structure of HeaderType

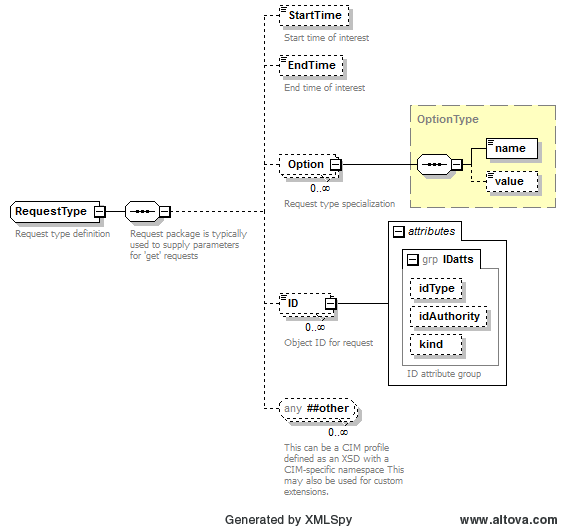
****

Figure C-7 Structure of RequestType

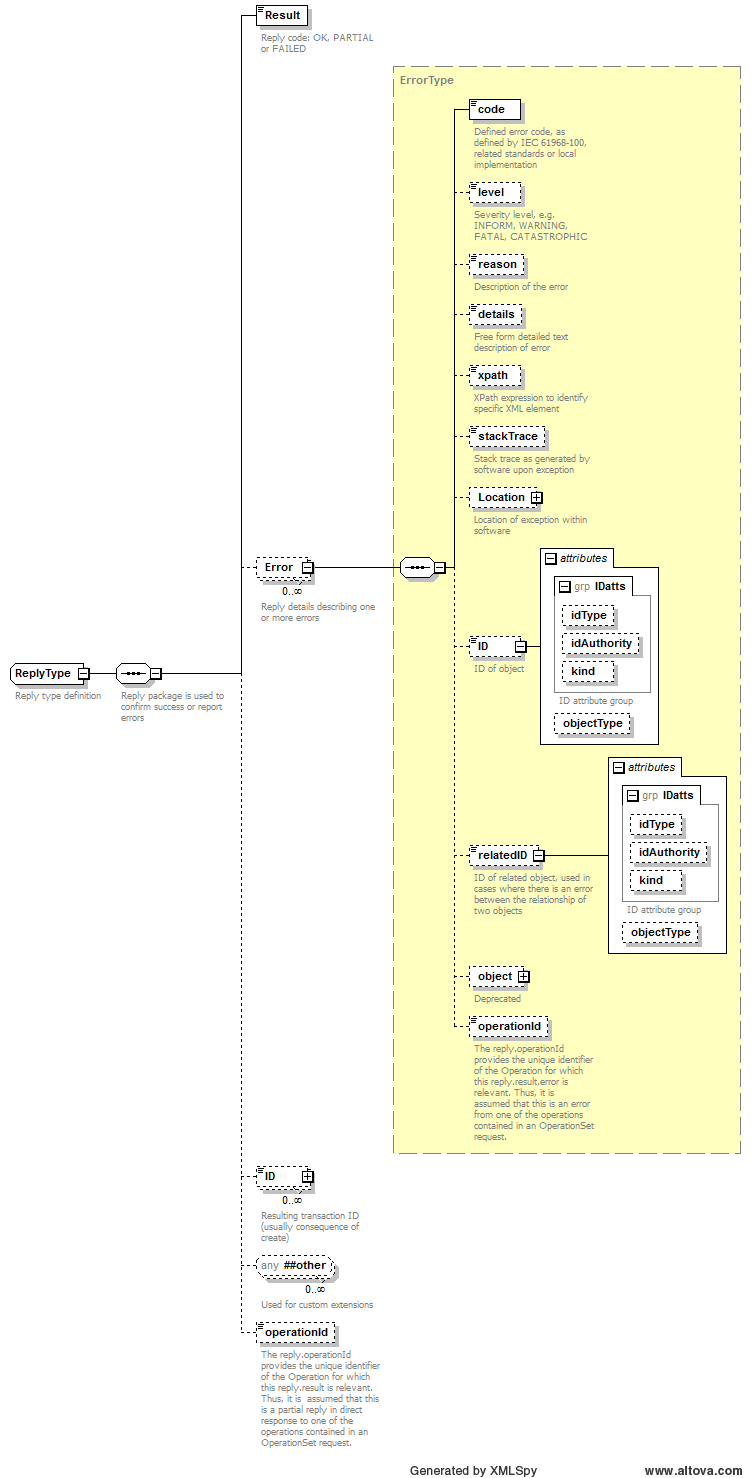


Figure C-8 Structure of ReplyType

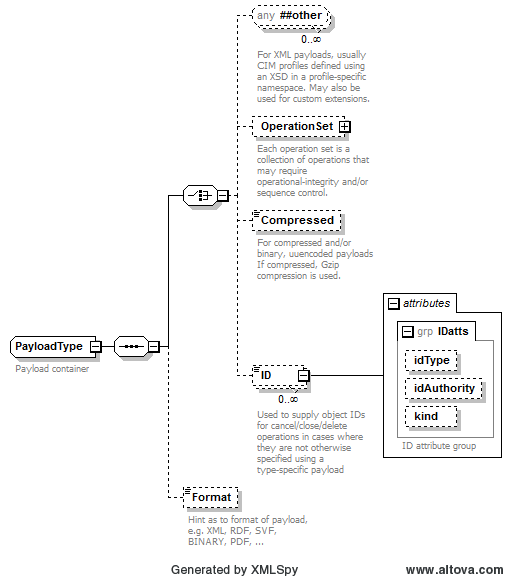


Figure C-9 Structure of PayloadType

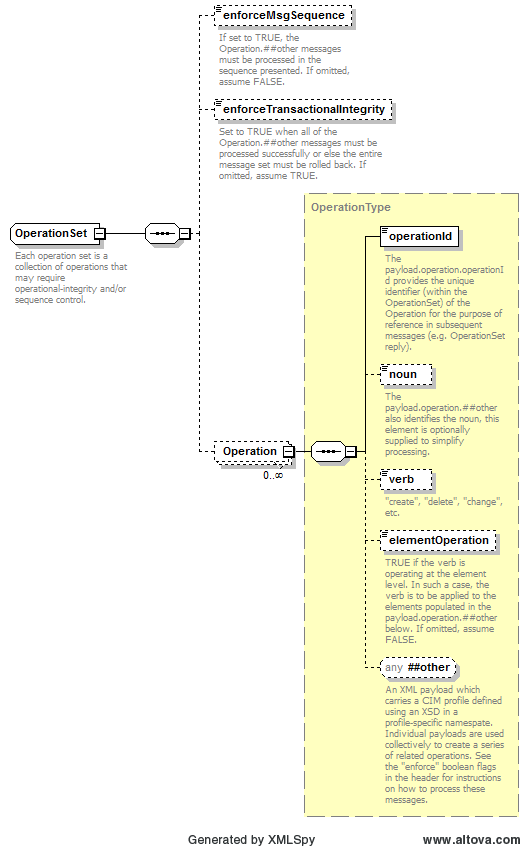


Figure C-10 Structure of OperationSet

The content of Message.xsd, taken directly from IEC 61968-100 can be found at:

{00-Part 100 Message XSD\Part 1}

For information concerning the use of OperationSets to support deletion of elements from a CIM Object (e.g., WorkRequest, MaintenanceOrder, or ServiceOrder), please refer to Annex D.

###### USE of OperationSets to support deletion of attributes and association classes from CIM Objects

*The following is derived from information in IEC 61968 Part 100 and IEC 61968 Part 9. In those documents there are two defined purposes for OperationSets. One involves the ability to perform a sequence of operations in a specified order and optionally preserve transactional integrity across the set of operations. The second usage is to support deletion of attributes and association classes (generically elements in the XSD/XML)from instances of CIM Objects (such as a WorkRequest, a maintenanceOrder, or a ServiceOrder). The first usage is not germaine to this Part 6 Test Script document and is not described below. The second is used in a number of test cases within this document (e.g., WR-3a).*

With the publication of the 1st Edition of IEC 61968 Part 100, the Message.xsd message envelope has been extended in both the Reply and Payload sections of the message to support the use of OperationSets. Refer to Figures C.8 through C.10 in the previous Annex for a depiction of the OperationSet and supporting constructs in Message.xsd.

A message utilizing the OperationSet construct always has a CIM Header verb of “execute” and a noun of “OperationSet”. An OperationSet in turn contains one or more Operations, and each Operation has an operationId which supplements the overall message CorrelationID to provide a fine-grained ability to correlate the contents of one or more reply messages with the individual Operations in an OperationSet. Individual Operations within an OperationSet have OperationSet-level verbs and nouns. When used to support the deletion of attributes or association classes (as done, the verb within an Operation will be either are: "delete" or “deleted”. The use of other verbs in the Operation(s) of an OperationSet is supported, but is not germaine to this Part 6 Test Script document.

Each Operation in an OperationSet also includes an elementOperation Boolean. This Boolean is to be set to true when the Operation verb is “delete” or "deleted" and the intent is to delete or reflect the deletion of individual attributes or individual instances of associated CIM classes from the object specified by the Operation noun. This is as opposed to deleting the entire CIM object specified by the Operation noun. If omitted, elementOperation is assumed to be false; therefore it is imperative to set it to true for the test cases when the intent is to delete attributes and association clases. It is emphasized that in this case, use of the Operation verb “delete”, in combination with an elementOperation Boolean set to true, effectively modifies (and does not delete) the CIM object specified by the Operation noun.

*Note 1: When modifying the configuration of a CIM object using the verbs "change", "changed", “delete", or “deleted”, only the ID of the object being changed and the information that is being changed or deleted is to be included. (This is true whether or not an OperationSet is being used.) It is for this reason that almost all elements within the unconstrained Part 6 XSDs (i.e., those used for are optional in the profiles.*

*Note 2: When deleting an attribute from a CIM object using an Operation where the elementOperation Boolean is true and the Operation verb is delete, it is necessary to supply a value for the attribute that will pass XML schema validation. In these instances, the actual value supplied is ignored and thus may be any value that is of the proper data type to pass validation.*

###### FDIS Version of IEC 61968 Part 6 profiles

The WorkRequests, MaintenanceOrders, and ServiceOrders profiles exactly as they appear in the Part 6 FDIS can be found at this location:

{01-Part 6 Original FDIS XSDs}

These are included here for completeness only, as these profiles are not used for the Test Cases in this document. See Annex F for the EPRI-generated Part 6 profiles used in the Test cases in this document. Please refer also to Section xx for a discussion of the differences between the FDIS profiles and the EPRI-generated profiles.

###### EPRI -Modified IEC 61968 Part 6 message profiles and Usage Guidelines

The EPRI-modified WorkRequests, MaintenanceOrders, and ServiceOrders profiles used to support the generation of Strongly-typed Message XSDs and WSDLS can be found at these locations:

{02-Part 6 XSDs modified by EPRI\'change or delete' Profiles}

{02-Part 6 XSDs modified by EPRI\'create' Profiles\Constrained by EPRI}

###### EPRI-Generated "get" message profiles for IEC 61968 Part 6

The EPRI-generated GetWorkRequests, GetMaintenanceOrders, and GetServiceOrders profiles at this location:

{02-Part 6 XSDs modified by EPRI\'get' Profiles}

###### EPRI-Generated Message Profiles and Templates for use in creating strongly-typed web services

The EPRI-generated MessageXSDs and XSD Templates used to support the testing associated with this Test Script document can be found at the following locations:

**Strongly-typed Message XSDs and Supporting Files referenced by Message XSDs**

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd}

**XSD Templatess**

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd\XSD Templates}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd\XSD Templates}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd\XSD Templates}

###### EPRI-Generated WSDLs and WSDL templates for use in creating strongly-typed web services

The EPRI-generated Message WSDLs and WSDL Templates used to support the testing associated with this Test Script document can be found at the following locations:

**WSDLs**

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'}

To generate the WSDLs, the corresponding Message XSDs and EPRI-generated Part 6 XSDs must be located in the corresponding "xsd" subdirectory directly under each of these locations. (See Annex H).

**WSDL Templates**

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\WSDL Templates}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\WSDL Templates}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\WSDL Templates}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd\XSD Templates}

**Strongly-typed Message XSDs and Supporting files referenced by WSDLs and MessageXSDs**

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd}

**XSD Templatess**

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'change or delete'\xsd\XSD Templates}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'create'\xsd\XSD Templates}

{03-Part 6 Strongly-typed Messages and WSDLs generated by EPRI\Messages and WSDLs for 'get'\xsd\XSD Templates}

###### IEC 61968 Part 100 Reply Codes To be Used for Testing

*The Reply.Error.codes that follow are either taken from or derived from the content in Annex B of the IEC 61968-9 International Standard. The specific Reply.Error.codes used in a given implementation will vary and are a function of the specific Enterprise Systems and the supported business functionality.nctionality.*

| **Reply.Error.code** | **Description** |
| --- | --- |
| 0.0 | Success / No errors |
| 6.1 | Request cancelled per business rule |

Response messages also have a single Reply.Result value. This is to be populated with “OK” (in the case of an Error.code having a first-position value of zero), or “FAILED” (in the case of an Error.code having a first-position value that is non-zero).

###### IEC 61968 Part 9 ReadingType Code To be Used for Testing

*Note: The ReadingType code that follow is in accordance with Annex C of the IEC 61968-9 2nd Edition International Standard.*

| **Commodity** | **ReadingType.Names.name** | **IEC Name** | **Common Use Description** |
| --- | --- | --- | --- |
| Electricity | 0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0 | BulkQuantity Forward Electricity SecondaryMetered Energy (kWh) | Forward Active Energy (kWh) |

###### IEC 61968 Part 9 ReadingQualityType Code To be Used for Testing

*Note: The ReadingType code that follows is in accordance with Annex D of the IEC 61968-9 2nd Edition International Standard.*

| **ReadingQualityType.Names.name** | **IEC Meaning** |
| --- | --- |
| 1.0.0 | Data from Meter (position 1)  Data Valid (positions 2&3) |

|  |  |
| --- | --- |
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