Semantic Annotations for WSDL (SAWSDL)
IBM Implementation Report

Submitted to:
World Wide Web (W3C) Consortium

Submitted by:
IBM

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May 7, 2007

Introduction

Semantic Annotations for WSDL (SAWSDL) Working Group has created a specification for semantically annotating Web Services that are written in Web Services Description Language (WSDL). On Jan 26th 2007 SAWSDL Working Group has issued a 'Call for Implementation' as part of Candidate Recommendation phase. IBM has been an active contributor to the SAWSDL specification and presents the following implementation report to W3C in response to the 'Call for Implementation'.

An Overview of IBM's Semantic Matching System

IBM's semantic matching system was first developed in 2001 and has been constantly upgraded since then. The latest version of the system has been made available in Oct 2006 at IBM's alphaworks Web site at: http://www.alphaworks.ibm.com/tech/wssem

The features of IBM's semantic matching system include:

- **Web Service Interface Matching:** Using this feature, one can semi-automatically map the interfaces of two given Web services (WSDLs). This scenario typically occurs when two legacy applications (each of which is represented as a Web service) are to be integrated with one another. This feature identifies the semantic similarities between the descriptions of the services by semi-automatically resolving the lexical, structural, and syntactic differences and creating the interface maps. (For example: An IT consultant could use this feature to resolve the differences between the purchase order messages exchanged between two companies).
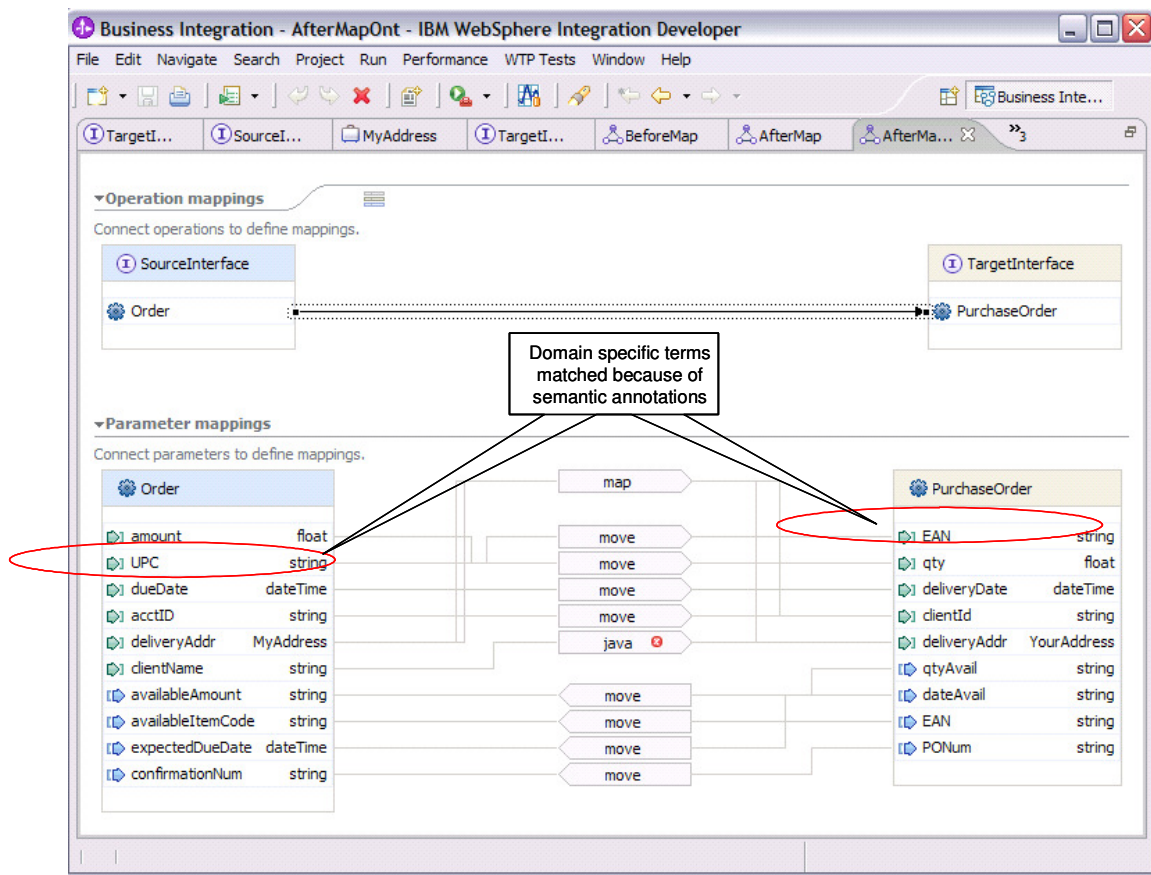
Figure 1: This screenshot shows the results of automatic mapping of Web services interfaces on two WSDL documents namely 'SourceInterface.wsdl' and 'TargetInterface.wsdl'. Both these WSDLs have been semantically annotated using concepts from an OWL ontology. These annotations helped match domain specific elements such as UPC and EAN codes. Other elements have been matched based on other heuristics such as lexical matching, synonym matching, abbreviation expansions, and multi-part word matching. The results of the mapping are shown in IBM's WebSphere Integration Developer (WID) tool which uses specific terminology such as 'move' and 'map. As you can note simple types are matched using a 'move' operation while complex types are matched using a 'map' operation. A 'move' here indicates a simple mapping while 'map' indicates a complex mapping. User can double click on 'map' to see how the elements within the complex types are mapped. Double clicking 'map' opens the complex type mappings in a separate editor that looks similar to this one.

- **Web Service Discovery:** This feature is useful if one is searching for existing Web services that can match a request from among a large set of Web services in a registry or repository. This scenario typically occurs when one is trying to reuse an existing piece of functionality (represented as a Web service) in building new or enhanced business processes. (For example: An IT consultant trying to implement an RFID checkout Web service for a new customer may want to find out if someone else in the organization has already implemented such a service for a different customer.)
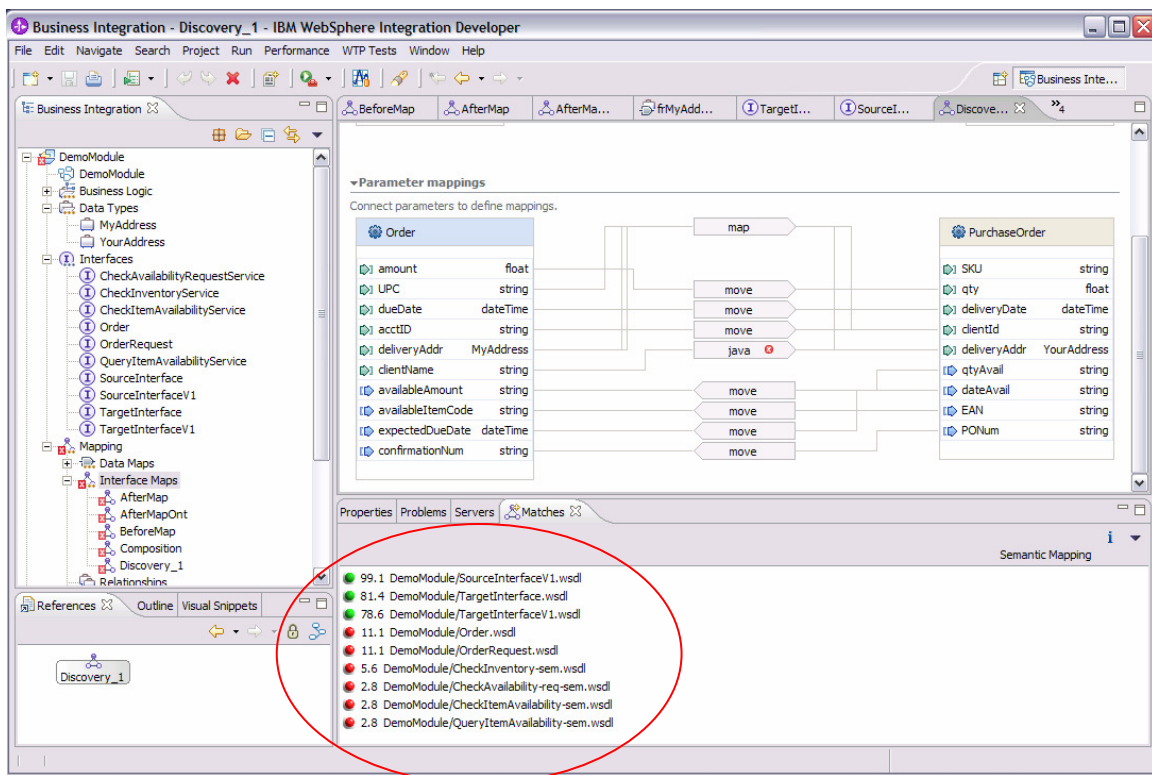

Figure 2: This screenshot shows the results of automatic Web service discovery. 'SourceInterface.wsdl' specified a set of requirements which have been matched with available Web services in a registry. The results of the match show Web services that have been rank ordered according to the 'goodness' of the match to the request 'SourceInterface.wsdl'.

- **Web Service Composition:** This feature is similar to Web service discovery. In the case of Web Service discovery, the system finds single services that match a request

(if they exist). The composition scenario demonstrates how multiple services can be composed to match a given request. The results include both direct single service matches (if they exist) and compositions of services (output as BPEL flows). This scenario typically occurs in business process integration when semantic or data mediations are necessary for matching the interfaces of two given services. (For example: A plain-text purchase order may have to be transformed into a digitally-signed and encrypted document before it can be sent to a supplier.)
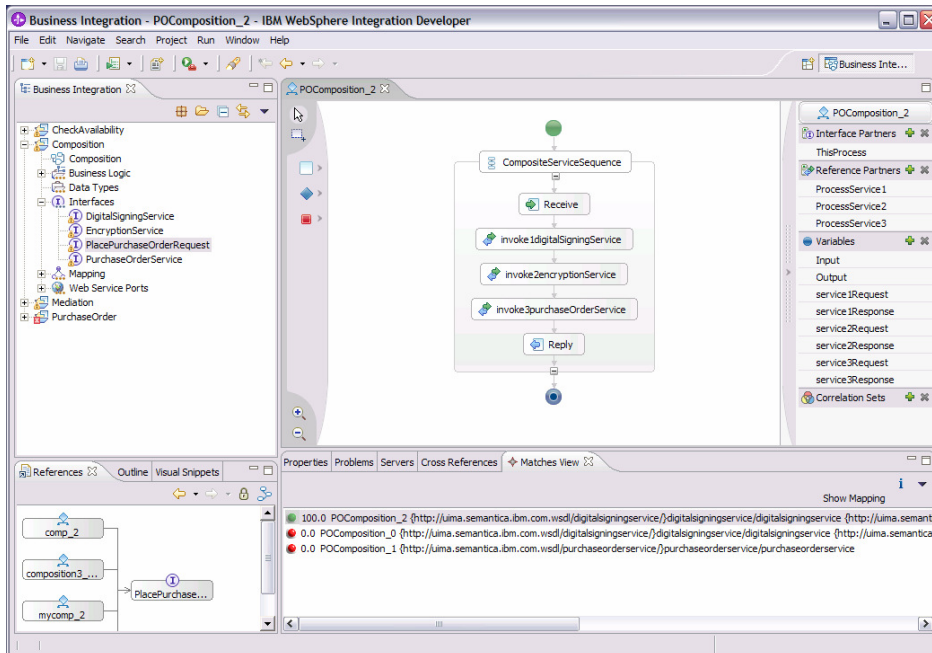

Figure 3: This screenshot shows the results of automatic Web service composition. 'PlacePurchaseOrderRequest.wsdl' specified a set of requirements which have been matched with available Web services in a registry. Since no single Web service could match the given requirements, the system had composed a set of services (in this case, a digital signing service, an encryption service and a purchase order service) to fulfill the requirements. The results of the composition is a BPEL is a document.

An accompanying document (referenced in Reference # 2) is also being submitted as part of this implementation report. This document describes the functions and features of IBM's semantic matching system more in detail.

Results of Running SAWSDL Test Suite

In our system, we added semantic annotations to WSDLs using WSDL-S [WSDL-S] format. Since SAWSDL builds on top of WSDL-S, the IBM system is able to parse many SAWSDL annotations with simple namespace changes. Below, we summarize the results of the parsing tests we conducted on the SAWSDL test suite. Screenshots of the output of the system that shows the results of the parsing are attached in Appendix A.

Definition of √: We consider a test case run a success, represented by '√' symbol, if our system is able to parse the given SAWSDL file and printout the semantic annotation(s) in the file by extracting them from the SAWSDL document.

Definition of ×: We consider a test case run to be a failure, represented by '×' symbol, if our system is either unable parse or unable to extract or unable to propagate the SAWSDL annotations as expected. The failure is correctable with additional coding to the system but has not been done at this time.

Clarification on the definition of test case success and failures: One can imagine that since the purpose of the semantic annotations to a WSDL document is to do semantic matching and composition, a test case should be considered a success only if one can not only extract the annotations but also demonstrate semantic matching and composition using these annotations. However, the matching pairs have not been provided in the test suite. So, we assume that the ability to parse and extract annotations is all that is required to demonstrate the success of test cases.

Feature number	Description	WSDL 1.1 (all .zip)	IBM Semantic Matching System status
0	plain WSDL document	simple	√
1	modelReference on WSDL Interface components (sec 3.1)	simple multi	×
2	(removed) ~~modelReferences from extended interface apply on extending interface~~ (sec 3.1)	dropped	
3	modelReference on WSDL Interface Operation components (sec 3.2)	simple	×
4	modelReference on WSDL Interface Fault components (sec 3.3)	N/A	×
5	(updated) modelReference on XML Schema Simple Type definitions, incl. propagation to element and attribute declarations (sec 4.1.1)	simple attribute	√ (no propagation)
6	(updated) modelReference on XML Schema Complex Type definitions (top-level), incl. propagation to element declarations (sec 4.1.2)	simple	√ (no propagation)
7	modelReference on XML Schema Element declarations (sec 4.1.3)	simple	√
8	modelReference on XML Schema Attribute declarations (sec 4.1.4)	simple	√

Feature number	Description	WSDL 1.1 (**all .zip**)	IBM Semantic Matching System status
9	liftingSchemaMapping on XML Schema Element declarations (sec 4.2)	simple multi	√
10	liftingSchemaMapping on XML Schema Type definitions (sec 4.2)	simple	√
11	loweringSchemaMapping on XML Schema Element declarations (sec 4.2)	simple	√
12	loweringSchemaMapping on XML Schema Type definitions (sec 4.2)	simple multi	√
13	liftingSchemaMapping and loweringSchemaMapping propagation from type definition to element declaration using that type, plus overriding (sec 4.2)	incl. feat. 12 simple multi	×
14	attrExtensions element with arbitrary annotations (sec 5.1)	simple	×
15	annotations on WSDL 1.1 elements (grouped together) (sec 5.2)	all above part	√
16	RDF mapping - turning annotations into RDF statements (sec 6)	N/A	

References

- WSDL-S: Web Service Semantics - WSDL-S. Rama Akkiraju, Joel Farrell, John Miller, Meenakshi Nagarajan, Amit Sheth, and Kunal Verma. Presented at the W3C workshop on 'Frameworks for semantics in Web Services' Innsbruck, Austria. June 2005.

- Semantic Tools for Web Services Installation and Usage Guide: http://www.alphaworks.ibm.com/tech/wssem

Appendix A: SAWSDL Test suite Results Output

0: Plain WSDL Document:

```
************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
Loaded defaults from c:/temp/defaults.txt
Number of definitions = 1


Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/00-plain.wsdl
Number of porttypes = 1
Name of Port = Order
Operation Name =  order

Processing message = OrderRequestMessage

Processing part = OrderRequest
Processing element in part

Processing message = OrderResponseMessage

Processing part = OrderResponse
Processing type in part
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Checking for leaf node status for
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest
No previous instance of element =OrderRequest category =element
Has XSDModelGroup
      modelGroup=sequence
Number of particles in model group = 2
No previous instance of element =customerNo category =element
Number of facets = 3 for type = integer
No previous instance of element =orderItem category =element
has attribute groups = 1
Has XSDModelGroup
      modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
Number of facets = 1 for type = string
Processing type simpleType
Number of facets = 2 for type = confirmation
Processing type complexType
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
Adding 14 attributes to definition 0
Number of attributes in Definition 0 = 14
```

```
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 8
Total number of attributes in all definitions = 14
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0
Name = OrderResponseMessageType = messageSchema ID = 1Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = customerNoType = elementSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = orderItemType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0

Indexed all the schema nodes
```

1: modelReference on WSDL Interface components

Not supported at this time

3: modelReference on WSDL Interface Operation components

Not supported at this time

4: modelReference on WSDL Interface Fault components

Not supported at this time

5: (updated) modelReference on XML Schema Simple Type definitions, incl. propagation to element and attribute declarations

```
************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
```

```
Loaded defaults from c:/temp/defaults.txt
Number of definitions = 1


Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/05-simpletype-annotation.wsdl
Number of porttypes = 1
Name of Port = Order
Operation Name =  order

Processing message = OrderRequestMessage

Processing part = OrderRequest
Processing element in part

Processing message = OrderResponseMessage

Processing part = OrderResponse
Processing type in part
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Checking for leaf node status for
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest
No previous instance of element =OrderRequest category =element
Has XSDModelGroup
      modelGroup=sequence
Number of particles in model group = 2
No previous instance of element =customerNo category =element
Number of facets = 3 for type = integer
No previous instance of element =orderItem category =element
has attribute groups = 1
Has XSDModelGroup
      modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
Number of facets = 1 for type = string
Processing element TestElement
No previous instance of element =TestElement category =element
Number of facets = 2 for type = confirmation
Added ontology info
(confirmation,http://www.w3.org/2002/ws/sawsdl/spec/ontology/purchaseor
der#OrderConfirmation)
Processing type simpleType
Processing type complexType
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
Adding 15 attributes to definition 0
Number of attributes in Definition 0 = 15
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 9
```

```
Total number of attributes in all definitions = 15
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0
Name = OrderResponseMessageType = messageSchema ID = 1Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = TestElementType = elementSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = customerNoType = elementSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = orderItemType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0

Indexed all the schema nodes
```

5: Simple Type annotation with attribute

```
************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
Loaded defaults from c:/temp/defaults.txt
Number of definitions = 1


Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/05-simpletype-annotation-with-attribute.wsdl
Number of porttypes = 1
Name of Port = Order
Operation Name =  order

Processing message = OrderRequestMessage

Processing part = OrderRequest
Processing element in part

Processing message = OrderResponseMessage
```

Processing part = OrderResponse
Processing type in part
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Checking for leaf node status for
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest
No previous instance of element =OrderRequest category =element
Has XSDModelGroup
      modelGroup=sequence
Number of particles in model group = 1
particle.getContent isa class org.eclipse.xsd.impl.XSDWildcardImpl
Processing type simpleType
Number of facets = 2 for type = confirmation
Added ontology info
(confirmation,http://www.w3.org/2002/ws/sawsdl/spec/ontology/purchaseor
der#OrderConfirmation)
Processing type complexType
has attribute groups = 1
Number of facets = 3 for type = integer
Has XSDModelGroup
      modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
Number of facets = 1 for type = string
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
Adding 12 attributes to definition 0
Number of attributes in Definition 0 = 12
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 6
Total number of attributes in all definitions = 12
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = OrderResponseMessageType = messageSchema ID = 1Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0

```
Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
```

6: modelReference on XML Schema Complex Type definitions (top-level)

```
************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
Loaded defaults from c:/temp/defaults.txt
Number of definitions = 1


Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/06-complextype-annotation.wsdl
Number of porttypes = 1
Name of Port = Order
Operation Name =  order

Processing message = OrderRequestMessage

Processing part = OrderRequest
Processing element in part

Processing message = OrderResponseMessage

Processing part = OrderResponse
Processing type in part
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Checking for leaf node status for
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest
No previous instance of element =OrderRequest category =element
Has XSDModelGroup
      modelGroup=sequence
Number of particles in model group = 2
No previous instance of element =customerNo category =element
Number of facets = 3 for type = integer
No previous instance of element =orderItem category =element
has attribute groups = 1
Added ontology info
(item,http://www.w3.org/2002/ws/sawsdl/spec/ontology/purchaseorder#Item
)
Has XSDModelGroup
      modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
```

```
Number of facets = 1 for type = string
Processing type simpleType
Number of facets = 2 for type = confirmation
Processing type complexType
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
Adding 14 attributes to definition 0
Number of attributes in Definition 0 = 14
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 8
Total number of attributes in all definitions = 14
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0
Name = OrderResponseMessageType = messageSchema ID = 1Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = customerNoType = elementSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = orderItemType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0

Indexed all the schema nodes
```

7: modelReference on XML Schema Element declarations

```
************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
Loaded defaults from c:/temp/defaults.txt
Number of definitions = 1


Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/07-element-annotation.wsdl
```

```
Number of porttypes = 1
Name of Port = Order
Operation Name =  order

Processing message = OrderRequestMessage

Processing part = OrderRequest
Processing element in part

Processing message = OrderResponseMessage

Processing part = OrderResponse
Processing type in part
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Checking for leaf node status for
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest
No previous instance of element =OrderRequest category =element
Has XSDModelGroup
       modelGroup=sequence
Number of particles in model group = 2
No previous instance of element =customerNo category =element
Number of facets = 3 for type = integer
No previous instance of element =orderItem category =element
has attribute groups = 1
Has XSDModelGroup
       modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
Number of facets = 1 for type = string
Added ontology info
(OrderRequest,http://www.w3.org/2002/ws/sawsdl/spec/ontology/purchaseor
der#OrderRequest)
Processing type simpleType
Number of facets = 2 for type = confirmation
Processing type complexType
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
Adding 14 attributes to definition 0
Number of attributes in Definition 0 = 14
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 8
Total number of attributes in all definitions = 14
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
```

Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0
Name = OrderResponseMessageType = messageSchema ID = 1Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = customerNoType = elementSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = orderItemType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0

Indexed all the schema nodes

8: modelReference on XML Schema Attribute declarations

************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
Loaded defaults from c:/temp/defaults.txt
Number of definitions = 1

Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/08-attribute-annotation.wsdl
Number of porttypes = 1
Name of Port = Order
Operation Name = order

Processing message = OrderRequestMessage

Processing part = OrderRequest
Processing element in part

Processing message = OrderResponseMessage

Processing part = OrderResponse
Processing type in part
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Checking for leaf node status for
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest

No previous instance of element =OrderRequest category =element
Has XSDModelGroup
      modelGroup=sequence
Number of particles in model group = 2
No previous instance of element =customerNo category =element
Number of facets = 3 for type = integer
No previous instance of element =orderItem category =element
has attribute groups = 1
Added ontology info
(quantity,http://www.w3.org/2002/ws/sawsdl/spec/ontology/purchaseorder#
Quantity)
Has XSDModelGroup
      modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
Number of facets = 1 for type = string
Processing type simpleType
Number of facets = 2 for type = confirmation
Processing type complexType
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
Adding 14 attributes to definition 0
Number of attributes in Definition 0 = 14
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 8
Total number of attributes in all definitions = 14
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0
Name = OrderResponseMessageType = messageSchema ID = 1Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = customerNoType = elementSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = orderItemType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0

9. liftingSchemaMapping on XML Schema Element declarations

```
************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
Loaded defaults from c:/temp/defaults.txt
Number of definitions = 1


Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/09-element-lifting.wsdl
Number of porttypes = 1
Name of Port = Order
Operation Name =  order

Processing message = OrderRequestMessage

Processing part = OrderRequest
Processing element in part

Processing message = OrderResponseMessage

Processing part = OrderResponse
Processing element in part

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest
No previous instance of element =OrderRequest category =element
Has XSDModelGroup
      modelGroup=sequence
Number of particles in model group = 2
No previous instance of element =customerNo category =element
Number of facets = 3 for type = integer
No previous instance of element =orderItem category =element
has attribute groups = 1
Has XSDModelGroup
      modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
Number of facets = 1 for type = string
Processing element OrderResponse
No previous instance of element =OrderResponse category =element
Number of facets = 2 for type = confirmation
Added ontology info
(OrderResponse,http://www.w3.org/2002/ws/sawsdl/spec/mapping/Response2O
nt.xslt)
Processing type simpleType
Processing type complexType
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
```

```
Adding 15 attributes to definition 0
Number of attributes in Definition 0 = 15
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 9
Total number of attributes in all definitions = 15
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0
Name = OrderResponseMessageType = messageSchema ID = 1Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderResponseType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = customerNoType = elementSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = orderItemType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
```

10: liftingSchemaMapping on XML Schema Type definitions

```
************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
Loaded defaults from c:/temp/defaults.txt
Number of definitions = 1


Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/10-type-lifting.wsdl
Number of porttypes = 1
Name of Port = Order
Operation Name =  order

Processing message = OrderRequestMessage

Processing part = OrderRequest
```

Processing element in part

Processing message = OrderResponseMessage

Processing part = OrderResponse
Processing type in part
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Checking for leaf node status for
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest
No previous instance of element =OrderRequest category =element
Has XSDModelGroup
      modelGroup=sequence
Number of particles in model group = 2
No previous instance of element =customerNo category =element
Number of facets = 3 for type = integer
No previous instance of element =orderItem category =element
has attribute groups = 1
Has XSDModelGroup
      modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
Number of facets = 1 for type = string
Processing type simpleType
Number of facets = 2 for type = confirmation
Added ontology info
(confirmation,http://www.w3.org/2002/ws/sawsdl/spec/mapping/Response2On
t.xslt)
Processing type complexType
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
Adding 14 attributes to definition 0
Number of attributes in Definition 0 = 14
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 8
Total number of attributes in all definitions = 14
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0
Name = OrderResponseMessageType = messageSchema ID = 1Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0

```
Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = customerNoType = elementSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = orderItemType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
```

11. loweringSchemaMapping on XML Schema Element declarations

```
************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
Loaded defaults from c:/temp/defaults.txt
Number of definitions = 1


Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/11-element-lowering.wsdl
Number of porttypes = 1
Name of Port = Order
Operation Name =  order

Processing message = OrderRequestMessage

Processing part = OrderRequest
Processing element in part

Processing message = OrderResponseMessage

Processing part = OrderResponse
Processing type in part
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Checking for leaf node status for
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest
No previous instance of element =OrderRequest category =element
Has XSDModelGroup
      modelGroup=sequence
Number of particles in model group = 2
No previous instance of element =customerNo category =element
Number of facets = 3 for type = integer
No previous instance of element =orderItem category =element
```

```
has attribute groups = 1
Has XSDModelGroup
      modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
Number of facets = 1 for type = string
Added ontology info
(OrderRequest,http://www.w3.org/2002/ws/sawsdl/spec/examples/mapping/On
t2OrderRequest.lowering)
Processing type simpleType
Number of facets = 2 for type = confirmation
Processing type complexType
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
Adding 14 attributes to definition 0
Number of attributes in Definition 0 = 14
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 8
Total number of attributes in all definitions = 14
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0
Name = OrderResponseMessageType = messageSchema ID = 1Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = customerNoType = elementSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = orderItemType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
```

12. loweringSchemaMapping on XML Schema Type definitions

```
************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
Loaded defaults from c:/temp/defaults.txt
```

```
Number of definitions = 1


Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/12-type-lowering.wsdl
Number of porttypes = 1
Name of Port = Order
Operation Name =  order

Processing message = OrderRequestMessage

Processing part = OrderRequest
Processing element in part

Processing message = OrderResponseMessage

Processing part = OrderResponse
Processing type in part
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Checking for leaf node status for
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest
No previous instance of element =OrderRequest category =element
Added ontology info
(complexType,http://www.w3.org/2002/ws/sawsdl/spec/examples/mapping/Ont
2OrderRequest.lowering)
Has XSDModelGroup
      modelGroup=sequence
Number of particles in model group = 2
No previous instance of element =customerNo category =element
Number of facets = 3 for type = integer
No previous instance of element =orderItem category =element
has attribute groups = 1
Has XSDModelGroup
      modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
Number of facets = 1 for type = string
Processing type simpleType
Number of facets = 2 for type = confirmation
Processing type complexType
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
Adding 14 attributes to definition 0
Number of attributes in Definition 0 = 14
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 8
Total number of attributes in all definitions = 14
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
```

```
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0
Name = OrderResponseMessageType = messageSchema ID = 1Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID
= -1Service ID = -1Definition ID = 0
Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID =
0Port ID = 0Service ID = -1Definition ID = 0
Name = customerNoType = elementSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0
Name = orderItemType = elementSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID =
-1Service ID = -1Definition ID = 0

Indexed all the schema nodes
```

15. annotations on WSDL 1.1 elements

```
************ This is One time setup *********

Loaded defaults from com/ibm/minelink/schemamatch/defaults.properties
Loaded defaults from c:/temp/defaults.txt
Number of definitions = 1


Processing definition
file:/C:/Projects/Creole/WIDV2/WorkspaceV4/com.ibm.siw.tests/examples/S
AWSDL/15-part-annotation.wsdl
Number of porttypes = 1
Name of Port = Order
Operation Name =  order

Processing message = OrderRequestMessage

Processing part = OrderRequest
Processing element in part
Added ontology info
(OrderRequest,http://www.w3.org/2002/ws/sawsdl/spec/examples/mapping/On
t2OrderRequest.lowering)
```

Added ontology info
(OrderRequest,http://www.w3.org/2002/ws/sawsdl/spec/ontology/purchaseor
der#OrderRequest)

Processing message = OrderResponseMessage

Processing part = OrderResponse
Processing type in part
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Checking for leaf node status for
{http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#}confirmation
Added ontology info
(OrderResponse,http://www.w3.org/2002/ws/sawsdl/spec/mapping/Response2O
nt.xslt http://example.org/mapping2 http://3.example/)

Processing schema http://www.w3.org/2001/XMLSchema
Schema name = http://www.w3.org/2001/XMLSchema
Processing schema = http://www.w3.org/2001/XMLSchema
Processing element OrderRequest
No previous instance of element =OrderRequest category =element
Has XSDModelGroup
      modelGroup=sequence
Number of particles in model group = 2
No previous instance of element =customerNo category =element
Number of facets = 3 for type = integer
No previous instance of element =orderItem category =element
has attribute groups = 1
Has XSDModelGroup
      modelGroup=all
Number of particles in model group = 1
No previous instance of element =UPC category =element
Number of facets = 1 for type = string
Processing type simpleType
Number of facets = 2 for type = confirmation
Processing type complexType
elementFormDefault="qualified"(elementFormDefault,qualified)
targetNamespace="http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#"(tar
getNamespace,http://www.w3.org/2002/ws/sawsdl/spec/wsdl/order#)
Adding 14 attributes to definition 0
Number of attributes in Definition 0 = 14
Number of attributes in schema 0 = 2
Number of attributes in schema 1 = 2
Number of attributes in schema 2 = 8
Total number of attributes in all definitions = 14
Name = itemType = complexTypeSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = confirmationType = baseSchema ID = 2Operation ID = -1Port ID = -
1Service ID = -1Definition ID = 0
Name = OrderRequestMessageType = messageSchema ID = 0Input
SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0
Name = OrderType = portTypeSchema ID = -1Operation ID = -1Port ID =
0Service ID = -1Definition ID = 0
Name = http://www.w3.org/2001/XMLSchemaType = schemaSchema ID =
2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0
Name = orderType = operationSchema ID = -1Operation ID = 0Port ID =
0Service ID = -1Definition ID = 0

Name = OrderResponseMessageType = messageSchema ID = 1Input SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0

Name = OrderRequestType = partSchema ID = 0Input SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0

Name = OrderRequestType = elementSchema ID = 2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0

Name = UPCType = elementSchema ID = 2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0

Name = OrderResponseType = partSchema ID = 1Input SchemaOperation ID = 0Port ID = 0Service ID = -1Definition ID = 0

Name = customerNoType = elementSchema ID = 2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0

Name = orderItemType = elementSchema ID = 2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0

Name = quantityType = attributeSchema ID = 2Operation ID = -1Port ID = -1Service ID = -1Definition ID = 0