



The Power of Connected Data



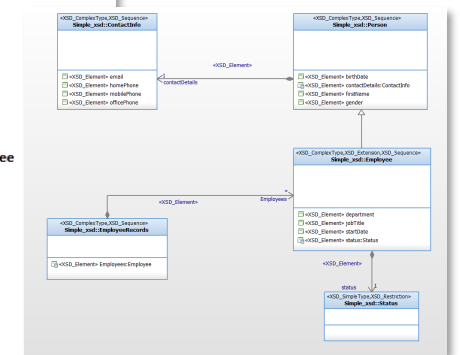
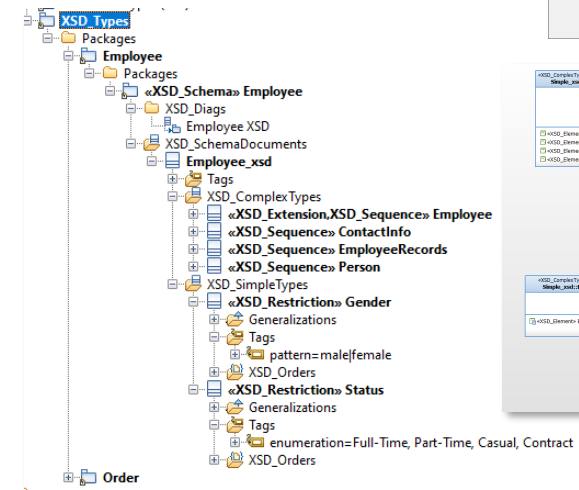
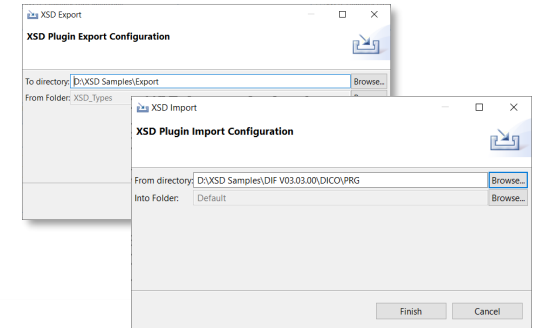
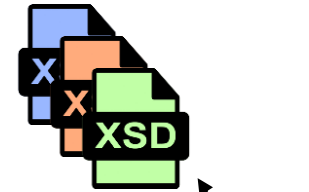
We design and distribute software solutions for Enterprise Interoperability, Data Transformation, and Model-Based Code Generation to improve traceability, exchange, and sharing of engineering data in highly regulated industries.

With offices in France, Germany and the USA, we deploy our solutions worldwide in Aerospace, Automotive, Transportation, Defense and Medical industries.

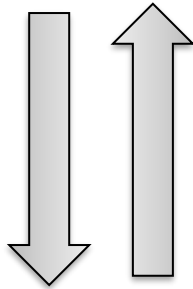
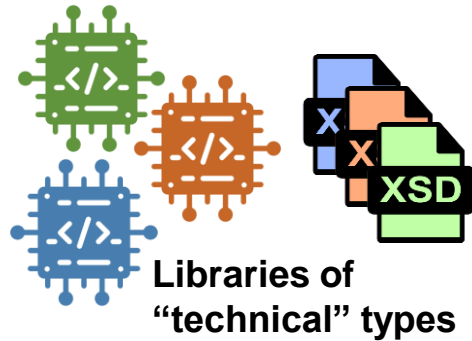


Rhapsody XSD

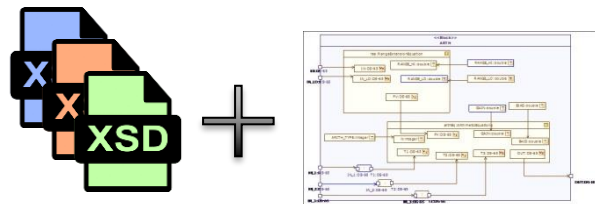
Import/Export XSD in Rhapsody



External Interfaces



Integrator



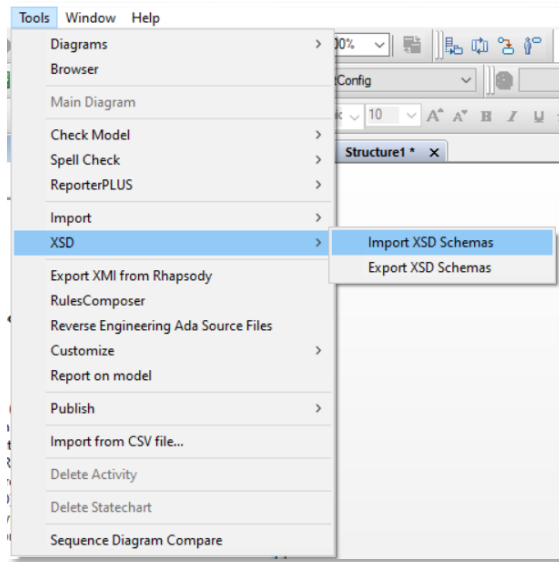
UML/SysML Integration

Context

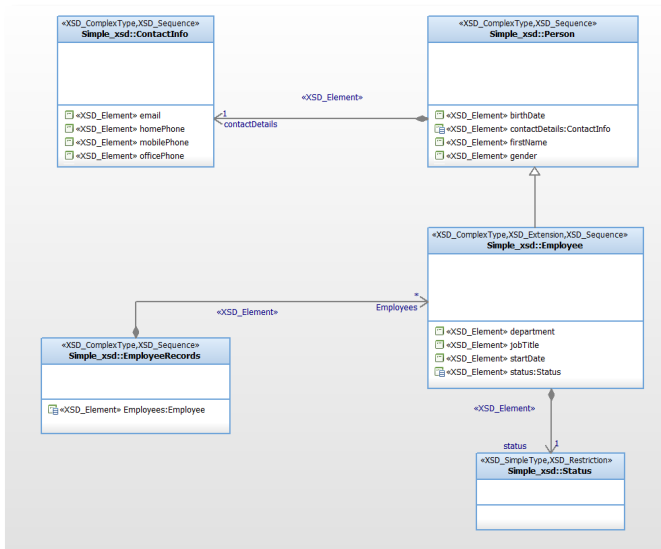
- During design, the data exchanged throughout external interfaces of a system are described by a set of technical XSD files
 - They have to be integrated in the UML/SysML models and types linked with the model.



Rhapsody XSD – Key Features

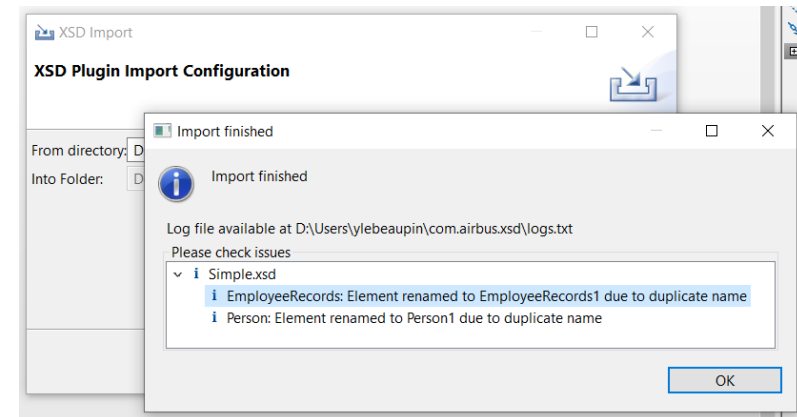
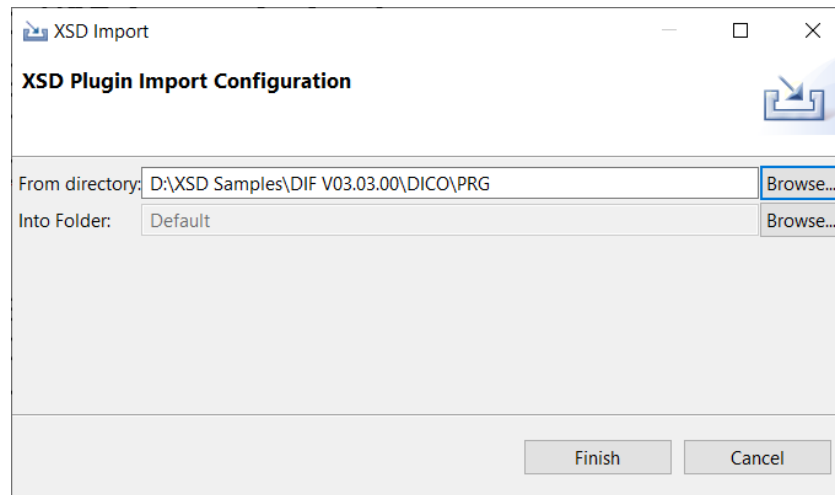
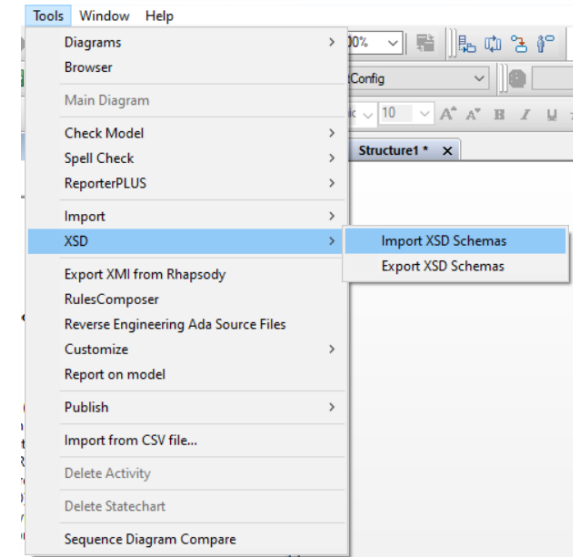


- **Integrate XSD types** in Rhapsody
 - Import XSD files in Rhapsody
- **Make XSD Types understandable** in Rhapsody
 - Simple concepts but enough expressivity
 - Complete XSD Profile and Diagram Support
- **Use Rhapsody as an XSD editor**
 - XSD Previewer
 - Export XSD Rhapsody to XSD Files



How to import XSD types in Rhapsody?

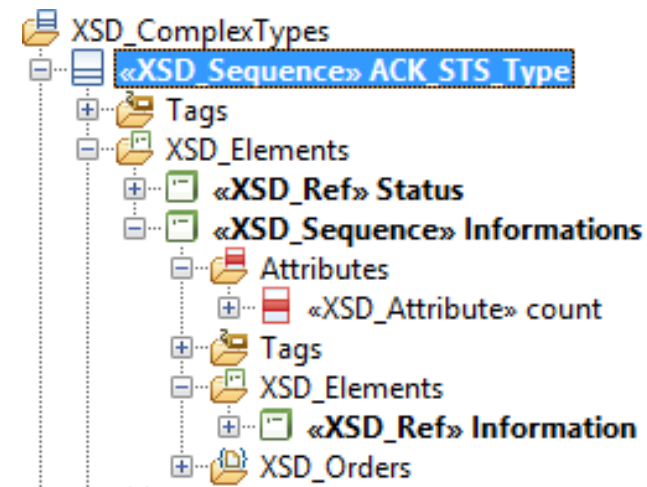
- We provide a XSD **Import plugin**
- Can be integrated with standard or customer profiles
- XSD Profile
 - Schema, ComplexTypes...
 - Extending SysML blocks
 - Providing standard library “XMLSchema”
- Allows browsing and creation of Rhapsody Package
- Progress bar
- Textual logs, and visual “tree log”



How to represent XSD Types in Rhapsody?

- Windows directory structure is reflected through Rhapsody Packages
- Each schema contains its own Package
- XSD structure simplified by tagging objects with stereotypes and usage of implicit parts

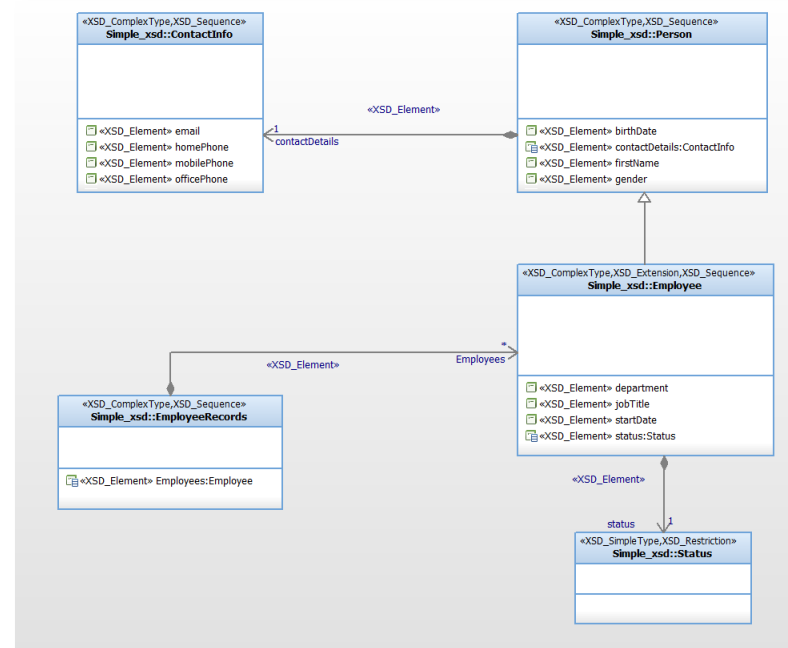
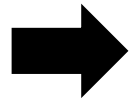
```
<xs:complexType name="ACK_STS_Type">
  <xs:sequence>
    <xs:element ref="edrs_ack_sts_enum:Status"/>
    <xs:element minOccurs="0" name="Informations">
      <xs:complexType>
        <xs:sequence>
          <xs:element maxOccurs="unbounded"
ref="edrs_ack_sts:Information"/>
        </xs:sequence>
        <xs:attribute name="count"
type="xs:positiveInteger" use="required"/>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```



Populate of Diagrams

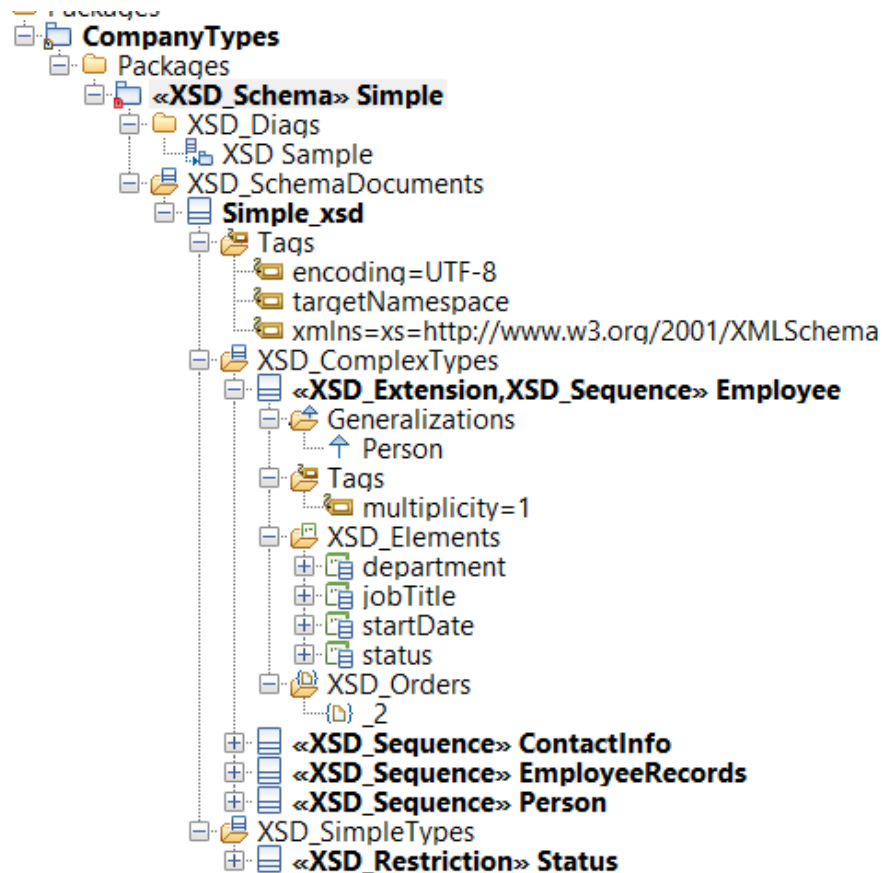
- You can display any XSD element in <<XSD_Diag>> diagrams (displaying internal structure of the selected type or relations between elements)

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleType name="Status">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Full-Time"/>
      <xs:enumeration value="Part-Time"/>
      <xs:enumeration value="Casual"/>
      <xs:enumeration value="Contract"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:complexType name="Person">
    <xs:sequence>
      <xs:element name="firstName" type="xs:string"/>
      <xs:element name="surName" type="xs:string"/>
      <xs:element name="birthDate" type="xs:string"/>
      <xs:element name="gender" type="xs:string"/>
      <xs:element name="contactDetails" type="ContactInfo"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="Employee">
    <xs:complexContent>
      <xs:extension base="Person">
        <xs:sequence>
          <xs:element name="status" type="Status"/>
          <xs:element name="jobTitle" type="xs:string"/>
          <xs:element name="startDate" type="xs:date"/>
          <xs:element name="department" type="xs:string"/>
        </xs:sequence>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
  <xs:complexType name="EmployeeRecords">
    <xs:sequence>
      <xs:element name="Employees" type="Employee" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="ContactInfo">
    <xs:sequence>
      <xs:element name="homePhone" type="xs:string"/>
      <xs:element name="mobilePhone" type="xs:string"/>
      <xs:element name="officePhone" type="xs:string"/>
      <xs:element name="email" type="xs:string"/>
      <xs:element name="streetAddress" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```



XSD_Schema

An «XSD_schema» stereotyped Package acts as a container for the **XSD** constructs, from which XML Schema can be generated. All Classes in the Package are defined inside a root <<XSD_SchemaDocument>>.



```
Simple.xsd x
1 <?xml version="1.0" encoding="UTF-8"?><xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" targetNamespace="">
2   <xs:simpleType name="Status">
3     <xs:restriction base="xs:string">
4       <xs:enumeration value="Full-Time"/>
5       <xs:enumeration value="Part-Time"/>
6       <xs:enumeration value="Casual"/>
7       <xs:enumeration value="Contract"/>
8     </xs:restriction>
9   </xs:simpleType>
10  <xs:complexType name="Person">
11    <xs:sequence>
12      <xs:element name="firstName" type="xs:string"/>
13      <xs:element name="surName" type="xs:string"/>
14      <xs:element name="birthDate" type="xs:string"/>
15      <xs:element name="gender" type="xs:string"/>
16      <xs:element name="contactDetails" type="ContactInfo"/>
17    </xs:sequence>
18  </xs:complexType>
19  <xs:complexType name="Employee">
20    <xs:complexContent>
```

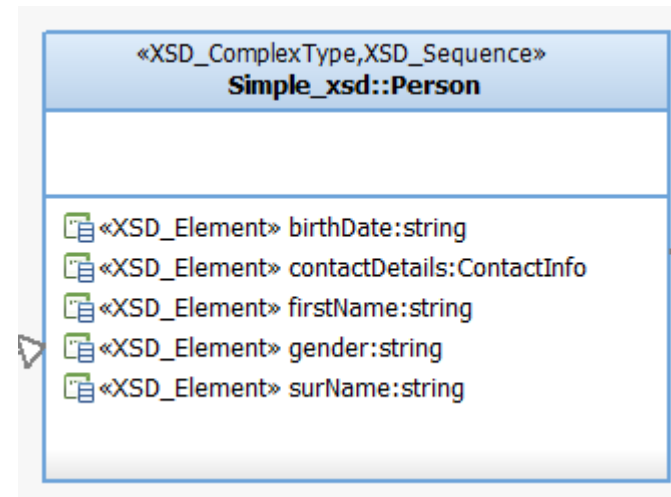
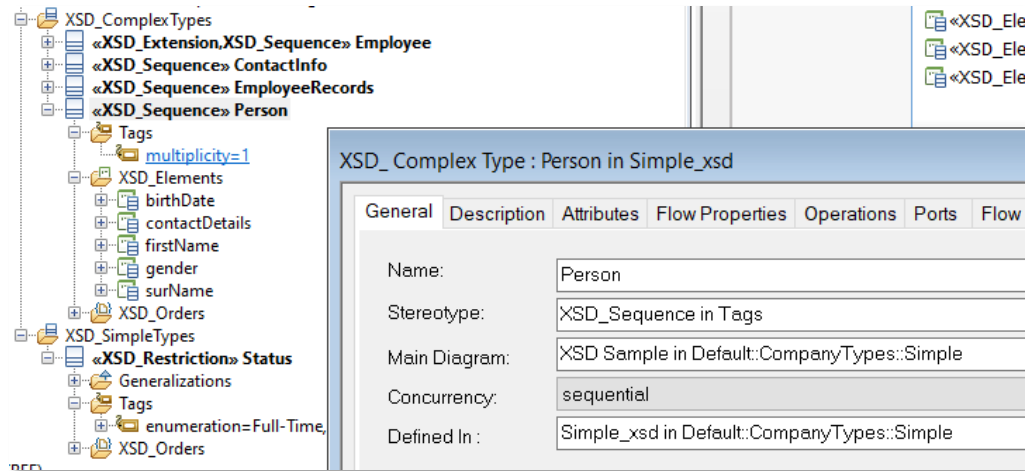
Note : the root <<XSD_SchemaDocument>> allows direct reference of the whole schema as a type, which is not possible with the «XSD_schema» package



XSD_ComplexType

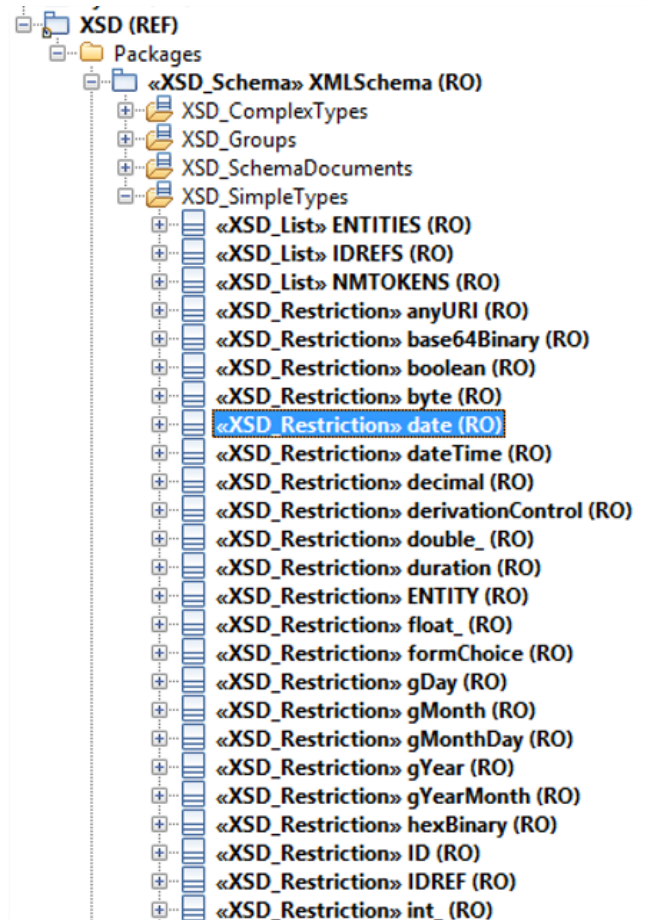
An «XSDcomplexType» stereotype is applied to a generic **UML Class**, to tailor the generation of a complexType definition in the Schema.

```
<xs:complexType name="Person">
  <xs:sequence>
    <xs:element name="firstName" type="xs:string"/>
    <xs:element name="surName" type="xs:string"/>
    <xs:element name="birthDate" type="xs:string"/>
    <xs:element name="gender" type="xs:string"/>
    <xs:element name="contactDetails" type="ContactInfo"/>
  </xs:sequence>
</xs:complexType>
```



Native XSD_SimpleType

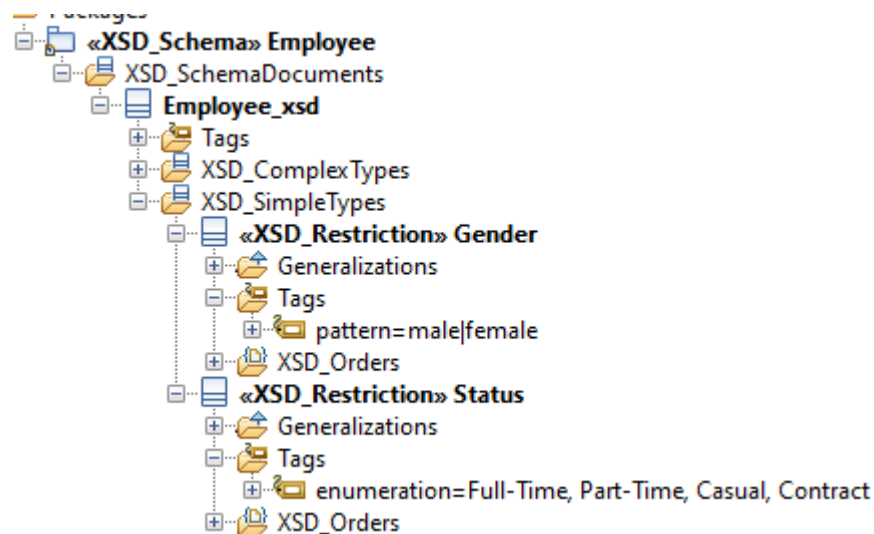
Creating a Schema requires to reference standard types defined in the XML Schema language, as “xsd:decimal”, “xsd:date” etc. The complete XSD Schema definition and its simpletypes is available in the XSD profile.



XSD_SimpleType

An «XSD_SimpleType» stereotype is applied to a generic **UML Class**, to tailor the generation of a SimpleType definition in the Schema. «XSD_Restriction» and associated tags are used to map enumerations for example.

```
<xs:simpleType name="Status">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Full-Time"/>
    <xs:enumeration value="Part-Time"/>
    <xs:enumeration value="Casual"/>
    <xs:enumeration value="Contract"/>
  </xs:restriction>
</xs:simpleType>
```



XSD_Simple Type : Status in Simple_xsd

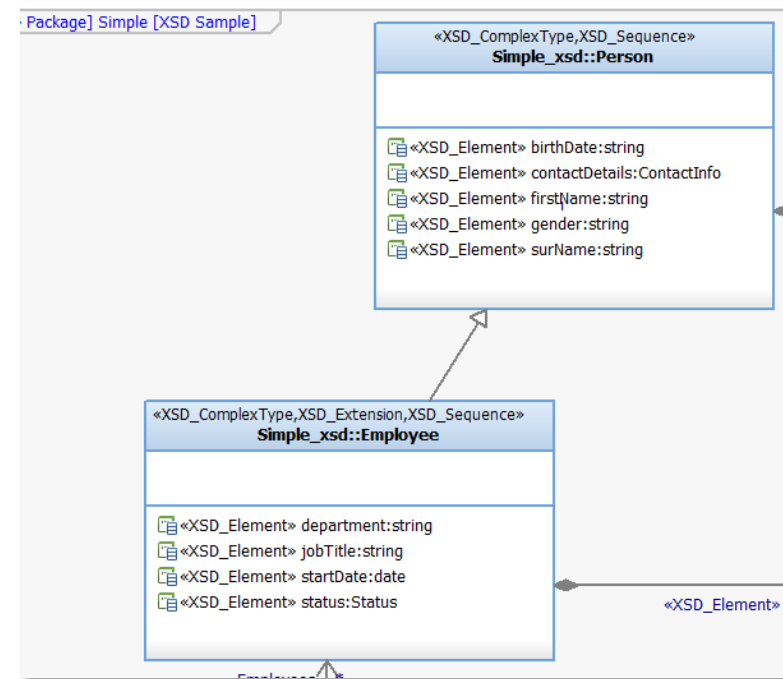
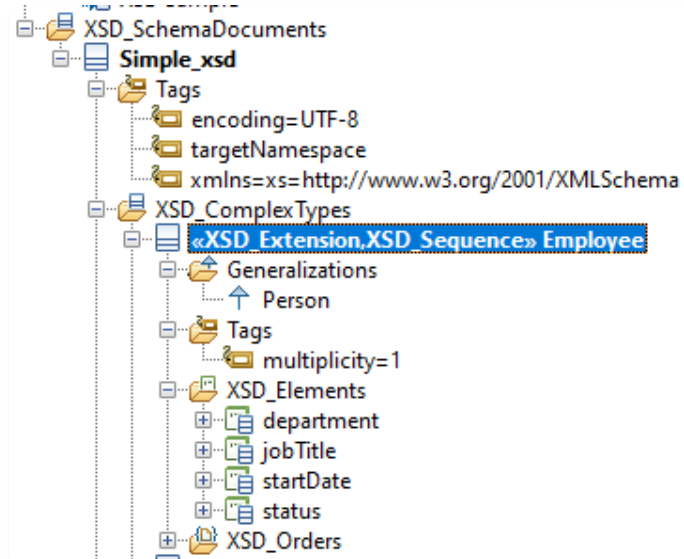
General	Description	Attributes	Flow Properties	Operations	Ports	Flow P
<input checked="" type="checkbox"/> Use default order						
Tags						
XSD_Restriction						
appinfo						
documentation						
enumeration Full-Time, Part-Time, Casual, Contract						
fractionDigits						
length						
maxExclusive						
maxInclusive						
maxLength						
minExclusive						
minInclusive						
minLength						
pattern						
totalDigits						
whiteSpace						
XSD_SimpleType						
appinfo						
documentation						
final schemaDefault						



XSD_Extension

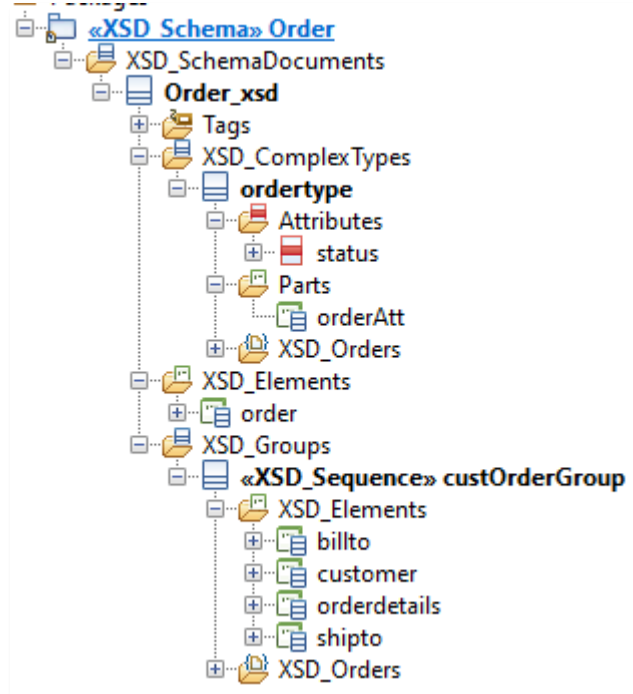
The extension element extends an existing simpleType or complexType element. An «XSD_Extension» stereotype is applied to a generic **UML Class**, to tailor the generation of an Extension definition in the Schema.

```
<xs:complexType name="Employee">
  <xs:complexContent>
    <xs:extension base="Person">
      <xs:sequence>
        <xs:element name="status" type="Status"/>
        <xs:element name="jobTitle" type="xs:string"/>
        <xs:element name="startDate" type="xs:date"/>
        <xs:element name="department" type="xs:string"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```



XSD_Group

An «XSD_Group» stereotype is applied to a generic **UML Class**, to tailor the generation of a Group definition in the Schema.



```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <xs:group name="custOrderGroup">
    <xs:sequence>
      <xs:element name="customer" type="xs:string"/>
      <xs:element name="orderdetails" type="xs:string"/>
      <xs:element name="billto" type="xs:string"/>
      <xs:element name="shipto" type="xs:string"/>
    </xs:sequence>
  </xs:group>

  <xs:element name="order" type="ordertype"/>

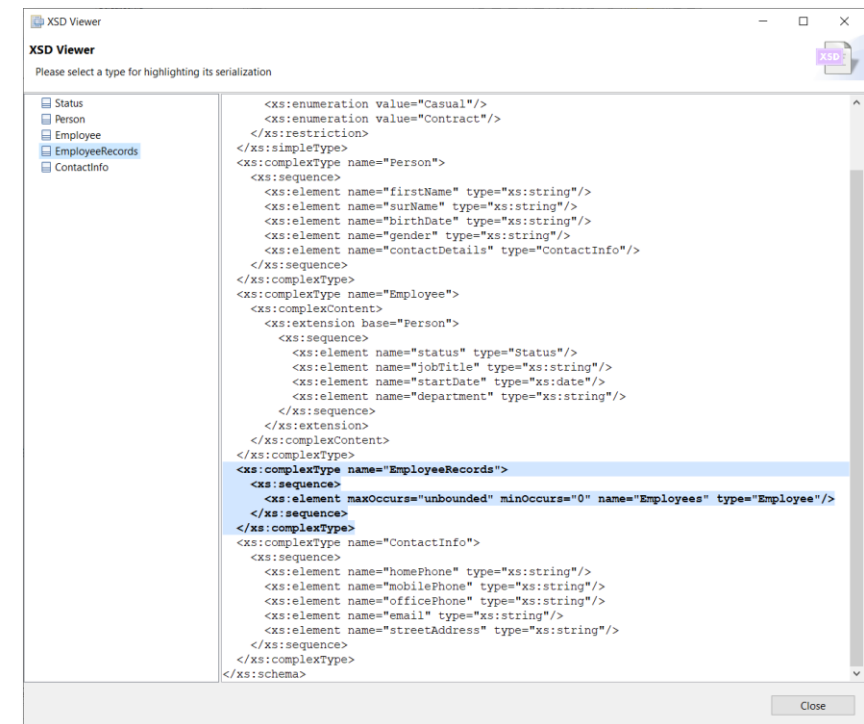
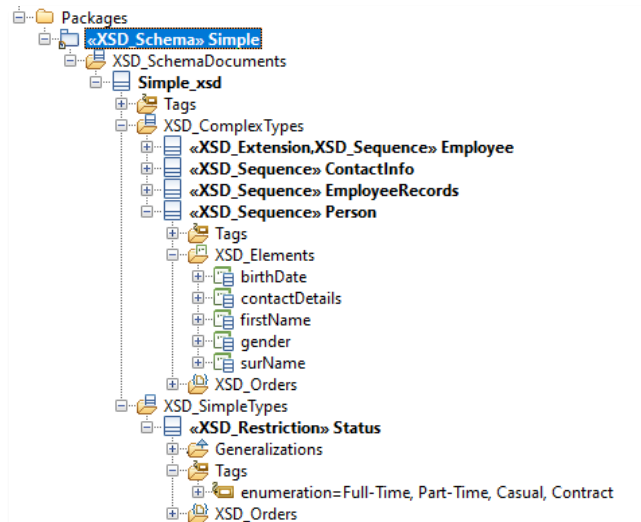
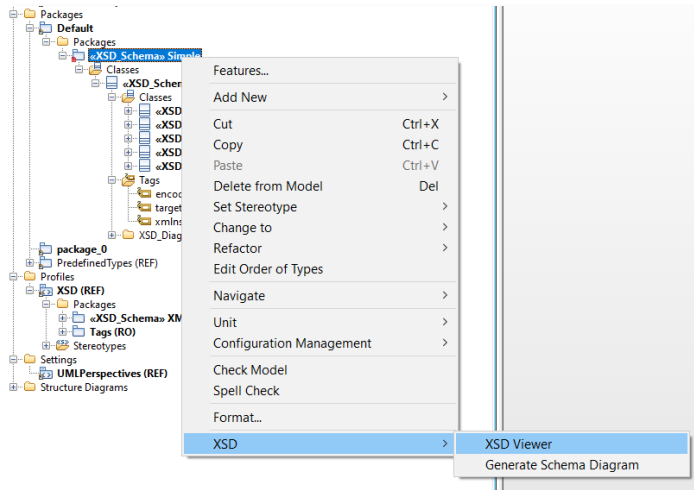
  <xs:complexType name="ordertype">
    <xs:group name="orderAtt" ref="custOrderGroup"/>
    <xs:attribute name="status" type="xs:string"/>
  </xs:complexType>

</xs:schema>
```



How to use Rhapsody as an XSD editor?

- New elements available in the “add new” menu
- XSD Diagrams have their tool menu extended for having new types
- We provide an export plugin, based on the same GUI than import
- We provide an XSD Viewer plugin
 - Bidirectional highlighting
 - Highlight types in Rhapsody browser





The Power of Connected Data

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