**PROMPT 1**

We have developed a Model-Driven Engineering (MDE) Workbench for CAEX (IEC 62424:2016). CAEX is one of the most promising standards for the data exchange between engineering tools in the production system automation domain. This is also reflected by the current emergence of AutomationML, which uses CAEX as its core representation data format. The Model-Driven Engineering Workbench for CAEX is based on the Eclipse Modeling Framework (EMF). This is the CAEX metamodel:

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

<ecore:EPackage xmi:version="2.0" xmlns:xmi="http://www.omg.org/XMI" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xmlns:ecore="http://www.eclipse.org/emf/2002/Ecore" name="caex" nsURI="http://www.dke.de/CAEX/300" nsPrefix="caex">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="qualified" value="false"/>

</eAnnotations>

<eClassifiers xsi:type="ecore:EDataType" name="AttributeDataType" instanceClassName="java.lang.String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="AttributeDataType\_.\_type"/>

<details key="baseType" value="http://www.eclipse.org/emf/2003/XMLType#string"/>

</eAnnotations>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="AttributeFamily" eSuperTypes="#//Attribute">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Defines base structures for attribute type definitions."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="AttributeFamilyType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="AttributeNameMapping" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="AttributeNameMapping\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="roleAttributeName" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="RoleAttributeName"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="systemUnitAttributeName"

lowerBound="1" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="SystemUnitAttributeName"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="roleAttribute" lowerBound="1"

eType="#//Attribute"/>

<eStructuralFeatures xsi:type="ecore:EReference" name="systemUnitAttribute" lowerBound="1"

eType="#//Attribute"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="Attribute" eSuperTypes="#//CAEXObject">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Defines base structures for attribute definitions."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="AttributeType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="defaultValue" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="A predefined default value for an attribute."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="DefaultValue"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="value" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Element describing the value of an attribute."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Value"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="refSemantic" upperBound="-1"

eType="#//RefSemantic" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="A reference to a definition of a defined attribute, e. g. to an attribute in a standardized library, this allows the semantic definition of the attribute."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="RefSemantic"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="constraint" upperBound="-1"

eType="#//AttributeValueRequirement" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Element to restrict the range of validity of a defined attribute."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Constraint"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="attribute" upperBound="-1"

eType="#//Attribute" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Element that allows the description of nested attributes."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Attribute"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="attributeDataType" eType="#//AttributeDataType">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Describes the data type of the attribute using XML notation."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="AttributeDataType"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="refAttributeType" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Refences an attribute type in the attribute library."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="RefAttributeType"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="unit" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Describes the unit of the attribute."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="Unit"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="referenceAttribute" eType="#//Attribute"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="AttributeLib" eSuperTypes="#//CAEXObject">

<eStructuralFeatures xsi:type="ecore:EReference" name="attributeType" upperBound="-1"

eType="#//Attribute" containment="true" resolveProxies="false"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="AttributeValueRequirement" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Defines base structures for definition of value requirements of an attribute."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="AttributeValueRequirementType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="ordinalScaledType" eType="#//OrdinalScaled"

containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Element of to define constraints of ordinal scaled attribute values."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="OrdinalScaledType"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="nominalScaledType" eType="#//NominalScaled"

containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Element of to define constraints of nominal scaled attribute values."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="NominalScaledType"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="unknownType" eType="#//UnknownType"

containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Element to define constraints for attribute values of an unknown scale type."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="UnknownType"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="name" lowerBound="1" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Describes the name of the contraint."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="Name"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="CAEXBasicObject">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="CAEX basis object that comprises a basic set of attributes and header information which exist for all CAEX elements."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="CAEXBasicObject"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="changeMode" eType="#//ChangeMode"

defaultValueLiteral="state" unsettable="true">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Optionally describes the change state of a CAEX object. If used, the ChangeMode shall have the following value range: state, create, delete and change. This information should be used for further change management applications."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="ChangeMode"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="description" eType="#//Description"

containment="true">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Textual description for CAEX objects."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Description"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="version" eType="#//Version"

containment="true">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Organizational information about the state of the version."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Version"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="revision" upperBound="-1"

eType="#//Revision" containment="true">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Organizational information about the state of the revision."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Revision"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="copyright" eType="#//Copyright"

containment="true">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Organizational information about copyright."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Copyright"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="additionalInformation"

upperBound="-1" eType="#//AdditionalInformation" containment="true"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="CAEXFile" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="CAEXFile\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="superiorStandardVersion"

unique="false" upperBound="-1" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Describes the version of a superior standard, e.g. AutomationML x.y. The version string is defined in the superior standard."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="SuperiorStandardVersion"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="sourceDocumentInformation"

lowerBound="1" upperBound="-1" eType="#//SourceDocumentInformation" containment="true"

resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Provides information about the source(s) of the CAEX document."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="SourceDocumentInformation"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="externalReference" upperBound="-1"

eType="#//ExternalReference" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Container element for the alias definition of external CAEX files."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="ExternalReference"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="instanceHierarchy" upperBound="-1"

eType="#//InstanceHierarchy" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Root element for a system hierarchy of object instances."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="InstanceHierarchy"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="interfaceClassLib" upperBound="-1"

eType="#//InterfaceClassLib" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Container element for a hierarchy of InterfaceClass definitions. It shall contain any interface class definitions. CAEX supports multiple interface libraries."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="InterfaceClassLib"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="roleClassLib" upperBound="-1"

eType="#//RoleClassLib" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Container element for a hierarchy of RoleClass definitions. It shall contain any RoleClass definitions. CAEX supports multiple role libraries."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="RoleClassLib"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="systemUnitClassLib" upperBound="-1"

eType="#//SystemUnitClassLib" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Container element for a hierarchy of SystemUnitClass definitions. It shall contain any SystemunitClass definitions. CAEX supports multiple SystemUnitClass libraries."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="SystemUnitClassLib"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="attributeTypeLib" upperBound="-1"

eType="#//AttributeLib" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Container element for a hierarchy of Attribute type definitions. CAEX supports multiple attribute type libraries."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="AttributeTypeLib"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="fileName" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Describes the name of the CAEX file."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="FileName"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="schemaVersion" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String" defaultValueLiteral="3.00"

unsettable="true">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Describes the version of the schema. Each CAEX document must specify which CAEX version it requires. The version number of a CAEX document must fit to the version number specified in the CAEX schema file. "/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="SchemaVersion"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="CAEXObject" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="CAEX basis object derived from CAEXBasicObject, augmented by &#xA;Name (required) and ID (optional)."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="CAEXObject"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="iD" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Optional attribute that describes a unique identifier of the CAEX object."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="ID"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="name" lowerBound="1" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Describes the name of the CAEX object."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="Name"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EEnum" name="ChangeMode">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="ChangeMode"/>

</eAnnotations>

<eLiterals name="state"/>

<eLiterals name="create" value="1"/>

<eLiterals name="delete" value="2"/>

<eLiterals name="change" value="3"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EDataType" name="ChangeModeObject" instanceClassName="org.eclipse.emf.common.util.Enumerator">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="ChangeMode:Object"/>

<details key="baseType" value="ChangeMode"/>

</eAnnotations>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="DocumentRoot">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value=""/>

<details key="kind" value="mixed"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="mixed" unique="false" upperBound="-1"

eType="ecore:EDataType http://www.eclipse.org/emf/2002/Ecore#//EFeatureMapEntry">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="elementWildcard"/>

<details key="name" value=":mixed"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="xMLNSPrefixMap" upperBound="-1"

eType="ecore:EClass http://www.eclipse.org/emf/2002/Ecore#//EStringToStringMapEntry"

transient="true" containment="true" resolveProxies="false">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="xmlns:prefix"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="xSISchemaLocation" upperBound="-1"

eType="ecore:EClass http://www.eclipse.org/emf/2002/Ecore#//EStringToStringMapEntry"

transient="true" containment="true" resolveProxies="false">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="xsi:schemaLocation"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="cAEXFile" upperBound="-2"

eType="#//CAEXFile" volatile="true" transient="true" derived="true" containment="true"

resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Root-element of the CAEX schema. "/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="CAEXFile"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="ExternalInterface" eSuperTypes="#//InterfaceClass">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="ExternalInterface\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="ExternalReference" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="ExternalReference\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="alias" lowerBound="1" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Describes the alias name of an external CAEX file to enable referencing elements of the external CAEX file."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="Alias"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="path" lowerBound="1" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Describes the path of the external CAEX file. Absolute and relative paths are allowed."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="Path"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="InstanceHierarchy" eSuperTypes="#//CAEXObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="InstanceHierarchy\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="internalElement" upperBound="-1"

eType="#//InternalElement" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Shall be used in order to define nested objects inside of a SystemUnitClass or another InternalElement. Allows description of the internal structure of a CAEX object."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="InternalElement"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="InterfaceClassLib" eSuperTypes="#//CAEXObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="InterfaceClassLib\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="interfaceClass" upperBound="-1"

eType="#//InterfaceClass" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Class definition for interfaces."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="InterfaceClass"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

... continue in the next prompt

**PROMPT 2**

Second part of the CAEX metamodel:

<eClassifiers xsi:type="ecore:EClass" name="InterfaceClass" eSuperTypes="#//CAEXObject">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Shall be used for InterfaceClass definition, provides base structures for an interface class definition."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="InterfaceClassType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="attribute" upperBound="-1"

eType="#//Attribute" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Characterizes properties of the InterfaceClass."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Attribute"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="refBaseClassPath" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Stores the reference of a class to its base class. References contain the full path to the refered class object."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="RefBaseClassPath"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="baseClass" eType="#//InterfaceClass"/>

<eStructuralFeatures xsi:type="ecore:EReference" name="interfaceClass" upperBound="-1"

eType="#//InterfaceClass" containment="true"/>

<eStructuralFeatures xsi:type="ecore:EReference" name="externalInterface" upperBound="-1"

eType="#//InterfaceClass" containment="true" resolveProxies="false">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="ExternalInterface"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="InterfaceFamily" eSuperTypes="#//InterfaceClass">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Defines base structures for a hierarchical InterfaceClass tree. The hierarchical structure of an interface library has organizational character only. "/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="InterfaceFamilyType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="InterfaceIDMapping" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="InterfaceIDMapping\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="roleInterfaceID" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="RoleInterfaceID"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="systemUnitInterfaceID"

lowerBound="1" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="SystemUnitInterfaceID"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="roleInterface" lowerBound="1"

eType="#//ExternalInterface"/>

<eStructuralFeatures xsi:type="ecore:EReference" name="systemUnitInterface" lowerBound="1"

eType="#//ExternalInterface"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="InternalElement" eSuperTypes="#//SystemUnitClass">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Defines base structures for a hierarchical object instance. The instance maybe part of the InstanceHierarchy or a SystemUnitClass."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="InternalElementType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="roleRequirements" upperBound="-1"

eType="#//RoleRequirements" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Describes role requirements of an InternalElement. It allows the definition of a reference to a RoleClass and the specification of role requirements like required attributes and required interfaces. "/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="RoleRequirements"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="refBaseSystemUnitPath"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Stores the reference of an InternalElement to a class or instance definition. References contain the full path information. "/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="RefBaseSystemUnitPath"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="baseSystemUnit" eType="#//SystemUnitClass"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="InternalLink" eSuperTypes="#//CAEXObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="InternalLink\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="refPartnerSideA" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="RefPartnerSideA"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="refPartnerSideB" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="RefPartnerSideB"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="partnerSideA" lowerBound="1"

eType="#//InterfaceClass"/>

<eStructuralFeatures xsi:type="ecore:EReference" name="partnerSideB" lowerBound="1"

eType="#//InterfaceClass"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="Mapping" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Base element for AttributeNameMapping and InterfaceIDMapping."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="MappingType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="attributeNameMapping" upperBound="-1"

eType="#//AttributeNameMapping" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Allows the definition of the mapping between attributes of a related role class or its interfaces and attributes of the hosting system unit"/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="AttributeNameMapping"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="interfaceIDMapping" upperBound="-1"

eType="#//InterfaceIDMapping" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Allows the definition of the mapping between interfaces of a related role class and interfaces of the hosting system unit."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="InterfaceIDMapping"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="NominalScaled">

<eStructuralFeatures xsi:type="ecore:EAttribute" name="requiredValue" unique="false"

upperBound="-1" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="OrdinalScaled">

<eStructuralFeatures xsi:type="ecore:EAttribute" name="requiredMaxValue" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String"/>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="requiredValue" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String"/>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="requiredMinValue" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="RefSemantic" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="RefSemantic\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="correspondingAttributePath"

lowerBound="1" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="CorrespondingAttributePath"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="RoleClassLib" eSuperTypes="#//CAEXObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="RoleClassLib\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="roleClass" upperBound="-1"

eType="#//RoleClass" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Definition of a class of a role type."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="RoleClass"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="RoleClass" eSuperTypes="#//CAEXObject">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Shall be used for RoleClass definition, provides base structures for a role class definition."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="RoleClassType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="attribute" upperBound="-1"

eType="#//Attribute" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Characterizes properties of the RoleClass."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Attribute"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="externalInterface" upperBound="-1"

eType="#//ExternalInterface" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Description of an external interface."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="ExternalInterface"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="refBaseClassPath" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Stores the reference of a class to its base class. References contain the full path to the refered class object."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="RefBaseClassPath"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="baseClass" eType="#//RoleClass"/>

<eStructuralFeatures xsi:type="ecore:EReference" name="roleClass" upperBound="-1"

eType="#//RoleClass" containment="true" resolveProxies="false"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="RoleFamily" eSuperTypes="#//RoleClass">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Defines base structures for a hierarchical RoleClass tree. The hierarchical structure of a role library has organizational character only. "/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="RoleFamilyType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="RoleRequirements" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="RoleRequirements\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="attribute" upperBound="-1"

eType="#//Attribute" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Characterizes properties of the RoleRequirements."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Attribute"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="externalInterface" upperBound="-1"

eType="#//InterfaceClass" containment="true" resolveProxies="false">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="ExternalInterface"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="mappingObject" eType="#//Mapping"

containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Host element for AttributeNameMapping and InterfaceIDMapping."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="MappingObject"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="roleClass" lowerBound="1"

eType="#//RoleClass"/>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="refBaseRoleClassPath" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="RefBaseRoleClassPath"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="SourceDocumentInformation">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Defines a structure to model information about the data source of the present CAEX document."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="SourceDocumentInformationType"/>

<details key="kind" value="empty"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="lastWritingDateTime" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//DateTime">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Date and time of the creation of the CAEX document."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="LastWritingDateTime"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="originID" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Unique identifier of the origin of the CAEX document, e.g. a unique identifier of a source engineering tool or an exporter software. The ID shall not change even if the origin gets renamed. "/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="OriginID"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="originName" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Name of the origin of the CAEX document, e.g. the source engineering tool or an exporter software"/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="OriginName"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="originProjectID" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Optional: a unique identifier of the corresponding source project"/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="OriginProjectID"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="originProjectTitle" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Optional: the title of the corresponding source project"/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="OriginProjectTitle"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="originRelease" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Optional: release information of the origin of the CAEX document, e.g. the version of the source engineering tool or the exporter software."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="OriginRelease"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="originVendor" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Optional: the vendor of the data source of the CAEX document"/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="OriginVendor"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="originVendorURL" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Optional: the vendors URL of the data source of the CAEX document"/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="OriginVendorURL"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="originVersion" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Version of the origin of the CAEX document, e.g. the version of the source engineering tool or the exporter software."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="OriginVersion"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="SupportedRoleClass" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="SupportedRoleClass\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="mappingObject" eType="#//Mapping"

containment="true" resolveProxies="false">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="MappingObject"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="refRoleClassPath" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="RefRoleClassPath"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="roleClass" lowerBound="1"

eType="#//RoleClass"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="SystemUnitClassLib" eSuperTypes="#//CAEXObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="SystemUnitClassLib\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="systemUnitClass" upperBound="-1"

eType="#//SystemUnitClass" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Shall be used for SystemUnitClass definition, provides definition of a class of a SystemUnitClass type."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="SystemUnitClass"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="SystemUnitClass" eSuperTypes="#//CAEXObject">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Defines base structures for a SystemUnit class definition."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="SystemUnitClassType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EReference" name="attribute" upperBound="-1"

eType="#//Attribute" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Characterizes properties of the SystemUnitClass."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Attribute"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="externalInterface" upperBound="-1"

eType="#//InterfaceClass" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Description of an external interface."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="ExternalInterface"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="internalElement" upperBound="-1"

eType="#//InternalElement" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Shall be used in order to define nested objects inside of a SystemUnitClass or another InternalElement. Allows description of the internal structure of a CAEX object."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="InternalElement"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="supportedRoleClass" upperBound="-1"

eType="#//SupportedRoleClass" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Allows the association to a RoleClass which this SystemUnitClass can play. A SystemUnitClass may reference multiple roles."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="SupportedRoleClass"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="internalLink" upperBound="-1"

eType="#//InternalLink" containment="true" resolveProxies="false">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Shall be used in order to define the relationships between internal interfaces of InternalElements."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="InternalLink"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EReference" name="baseClass" eType="#//SystemUnitClass"/>

<eStructuralFeatures xsi:type="ecore:EReference" name="systemUnitClass" upperBound="-1"

eType="#//SystemUnitClass" containment="true" resolveProxies="false"/>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="refBaseClassPath" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String"/>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="SystemUnitFamily" eSuperTypes="#//SystemUnitClass">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Defines base structures for a hierarchical SystemUnitClass tree. The hierarchical structure of a SystemUnit library has organizational character only. "/>

</eAnnotations>

... continue in the next prompt

**PROMPT 3**

Third part of the CAEX metamodel:

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="SystemUnitFamilyType"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="UnknownType">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="UnknownType\_.\_type"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="requirements" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http://www.eclipse.org/emf/2002/GenModel">

<details key="documentation" value="Defines informative requirements as a constraint for an attribute value."/>

</eAnnotations>

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Requirements"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="Copyright">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="Copyright"/>

<details key="kind" value="simple"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="value" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value=":0"/>

<details key="kind" value="simple"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="changeMode" eType="#//ChangeMode">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="ChangeMode"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="Description">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="Description"/>

<details key="kind" value="simple"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="value" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value=":0"/>

<details key="kind" value="simple"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="changeMode" eType="#//ChangeMode">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="ChangeMode"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="Revision" eSuperTypes="#//CAEXBasicObject">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="Revision"/>

<details key="kind" value="elementOnly"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="revisionDate" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//DateTime">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="RevisionDate"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="oldVersion" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="OldVersion"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="newVersion" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="NewVersion"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="authorName" lowerBound="1"

eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="AuthorName"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="comment" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="element"/>

<details key="name" value="Comment"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="Version">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value="Version"/>

<details key="kind" value="simple"/>

</eAnnotations>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="value" eType="ecore:EDataType http://www.eclipse.org/emf/2003/XMLType#//String">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="name" value=":0"/>

<details key="kind" value="simple"/>

</eAnnotations>

</eStructuralFeatures>

<eStructuralFeatures xsi:type="ecore:EAttribute" name="changeMode" eType="#//ChangeMode">

<eAnnotations source="http:///org/eclipse/emf/ecore/util/ExtendedMetaData">

<details key="kind" value="attribute"/>

<details key="name" value="ChangeMode"/>

<details key="namespace" value="##targetNamespace"/>

</eAnnotations>

</eStructuralFeatures>

</eClassifiers>

<eClassifiers xsi:type="ecore:EClass" name="AdditionalInformation" eSuperTypes="../../caex.anytype/model/GenericAnyType.ecore#//GenericElement"/>

</ecore:EPackage>

**PROMPT 4**

Consider the previous prompts, where I write the metamodel used in CAEX modeling environment. This is an example model based on CAEX metamodel:

<?xml version="1.0" encoding="ISO-8859-1"?>

<caex:CAEXFile xmi:version="2.0" xmlns:xmi="http://www.omg.org/XMI" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:caex="http://www.dke.de/CAEX/300" fileName="SyntheticModel">

<instanceHierarchy name="TopLevelElement">

<internalElement name="Element">

<externalInterface xsi:type="caex:ExternalInterface" name="EI\_1">

<baseClass href="//@interfaceClassLib.0/@interfaceClass.0"/>

</externalInterface>

<externalInterface xsi:type="caex:ExternalInterface" name="EI\_2">

<baseClass href="//@interfaceClassLib.0/@interfaceClass.0"/>

</externalInterface>

<internalLink name="Link\_1">

<partnerSideA refPartnerSideA="//@Element.externalInterface.0"/>

<partnerSideB refPartnerSideB="ExternalComponent\_1.externalInterface.0"/>

</internalLink>

<internalLink name="Link\_2">

<partnerSideA refPartnerSideA="//@Element.externalInterface.1"/>

<partnerSideB refPartnerSideB="ExternalComponent\_2.externalInterface.0"/>

</internalLink>

<internalElement name="NestedElement">

<attribute name="someAttribute" attributeDataType="string">

<value>10</value>

<unit>meters</unit>

</attribute>

</internalElement>

</internalElement>

</instanceHierarchy>

<interfaceClassLib name="SyntheticInterfaceClassLib">

<interfaceClass name="GenericInterfaceClass"/> </interfaceClassLib>

</caex:CAEXFile>

This is a XES trace file representing the modeling step done when we created the example model based on CAEX metamodel:

event InstanceHierarchy internalElement ADD

event InternalElement internalElement ADD

event InternalElement name SET

event InternalElement name SET

event InternalElement name SET

event InternalElement externalInterface ADD

event InternalElement externalInterface ADD

event InternalElement internalLink ADD

event InternalLink partnerSideA SET

event InternalLink partnerSideB SET

event InternalElement externalInterface ADD

event InternalElement externalInterface ADD

event InternalElement internalLink ADD

event InternalLink partnerSideA SET

event InternalLink partnerSideB SET

event InternalElement attribute ADD

event Attribute name SET

event Attribute value SET

event Attribute unit SET

Generate the full XES trace file from the following CAEX model, where the model represents another application:

<CAEX\_MODEL>