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Spectra CX 4

for SCA 4.1

WInnComm 2016

March 2016

Spectra CX 4

- Complete modeling tool for SCA 4.1
- Supports all the SCA 4.1 constructs, including
  - Sub assemblies
  - Multiple controllers
  - Units of Functionality (UOFs)
  - Application & Platform FactoryComponent
- SCA 4.1 validation
- SCA 4.1 XML generation
- SCA 4.1 C++ code generation

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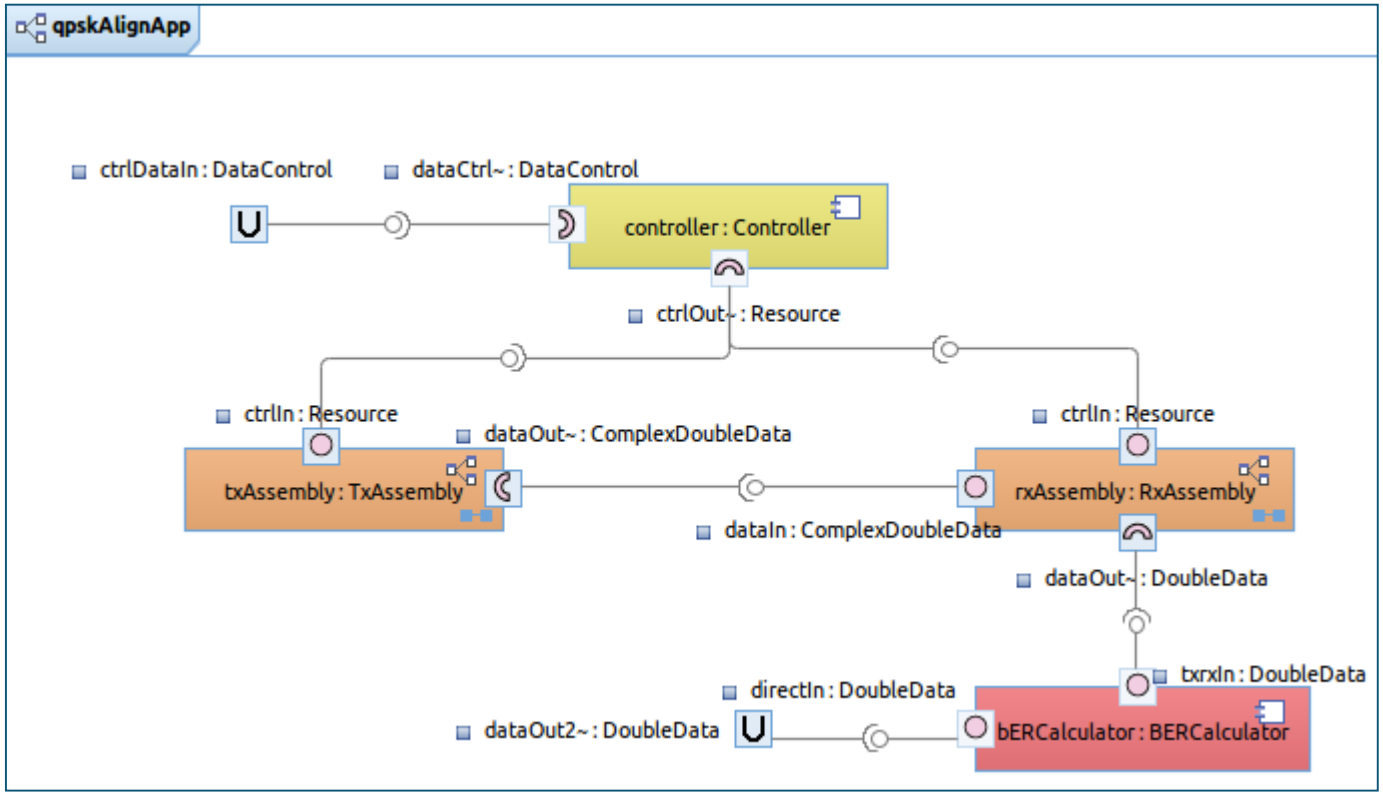
Spectra CX 4 Modeling

- Sub-assemblies



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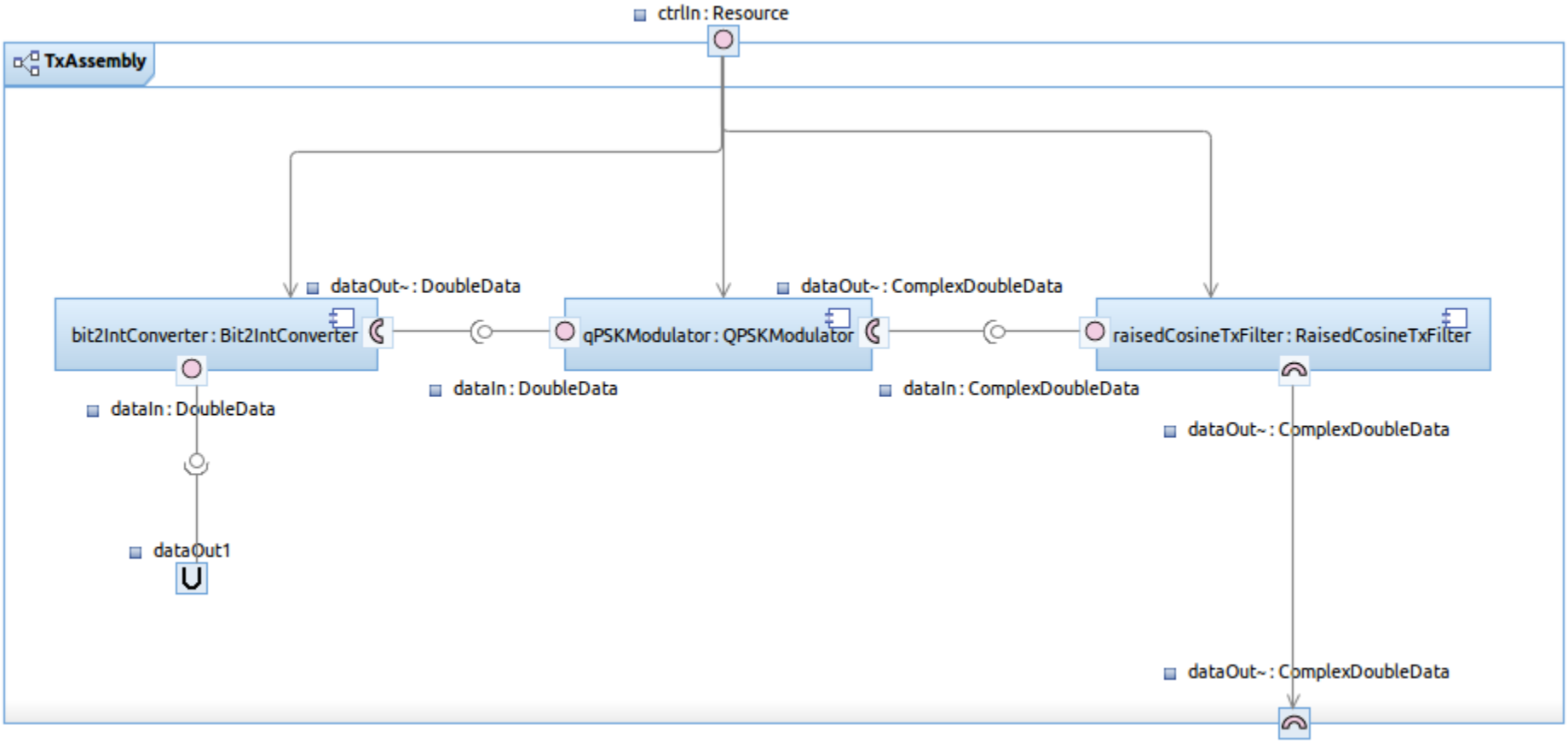
Sub-assembly Decomposition



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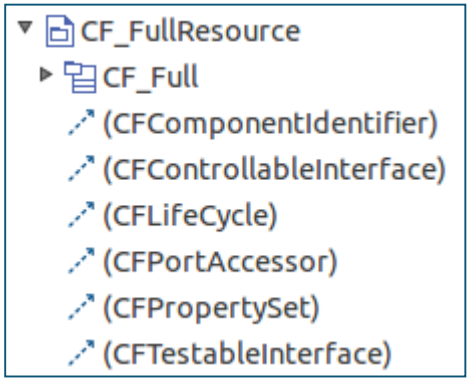
Model Migration

- Migrates SCA 2.2.x models to SCA 4.1 models
- IDL Model library containing interfaces similar to SCA 2.2.x interfaces



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Model Migration Report

- Produces HTML report for elements that cannot be mapped to SCA 4.1

SCA 4.1 migration report

Model: /CXTutorial/CXTutorial_Model.emx
Migration date: Jan 15, 2016

The following references to SCA 2.2.2 model library elements could not be mapped to equivalent SCA 4.1 elements. Instead, they have been mapped to elements in the **unresolvedElements** package.

SCA 2.2 model library unresolved references

Unresolved reference	Referencing element	Referencing feature
CF_IDL::CF::CF::Resource	CXTutorial_Model::TutorialApplication::AssemblyController::AssemblyControllerInterface::decryptCtrl	type
CF_IDL::CF::CF::Resource	CXTutorial_Model::TutorialApplication::AssemblyController::AssemblyControllerInterface::filterCtrl	type

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Component wizard

- Assist user to create new components with appropriate UOFs
  - supports interface is set to new IDL interface with UOFs or references an existing IDL interface
  - creates component, component interface (ports and supports interface) and implementation
  - creates specified dependencies
  - Auto-creates properties where needed
    - LoadableDevice – processor_name
    - ExecutableDevice – processor_name, os_name

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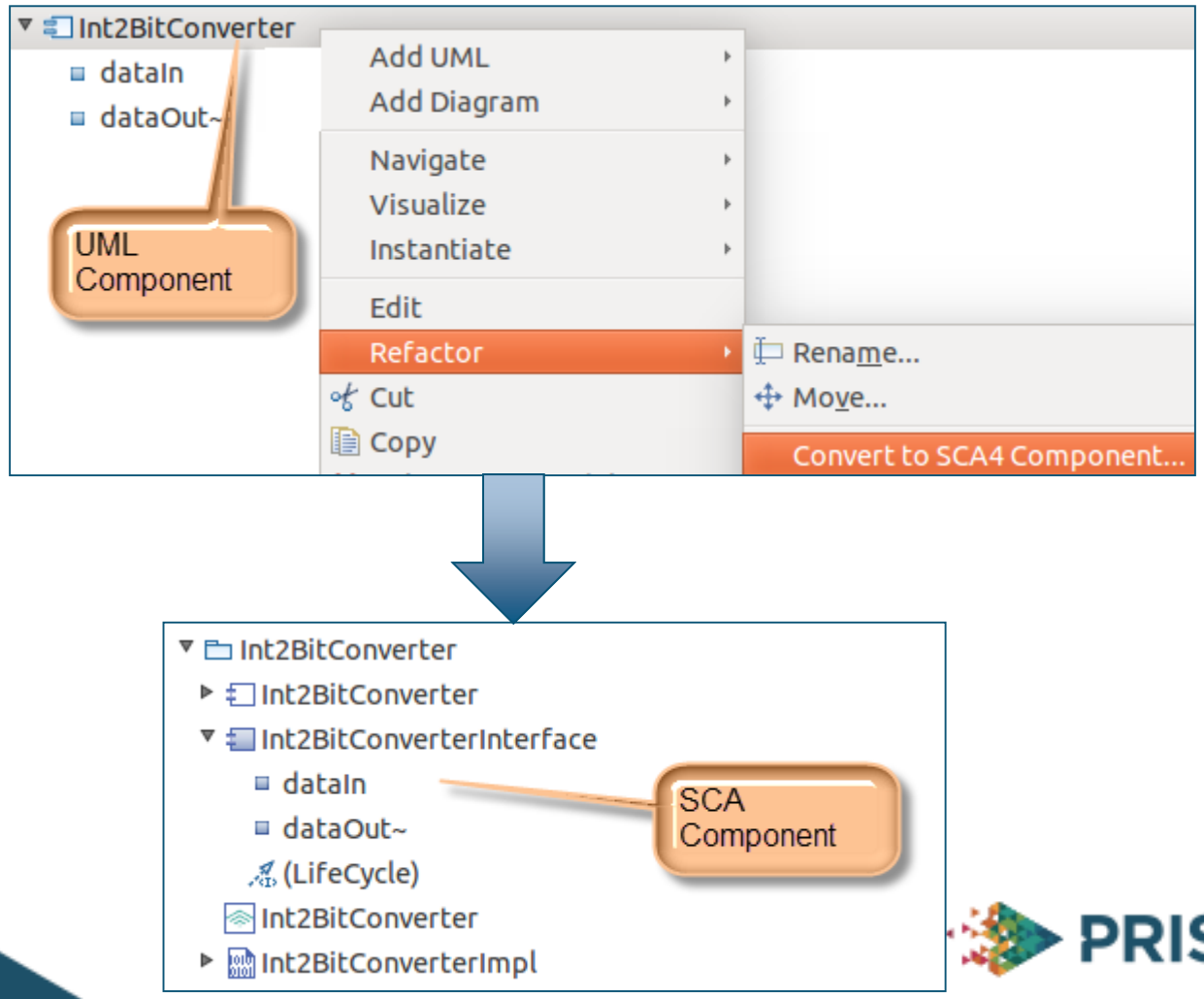
Component Wizard …

- Convert UML components to SCA 4 components



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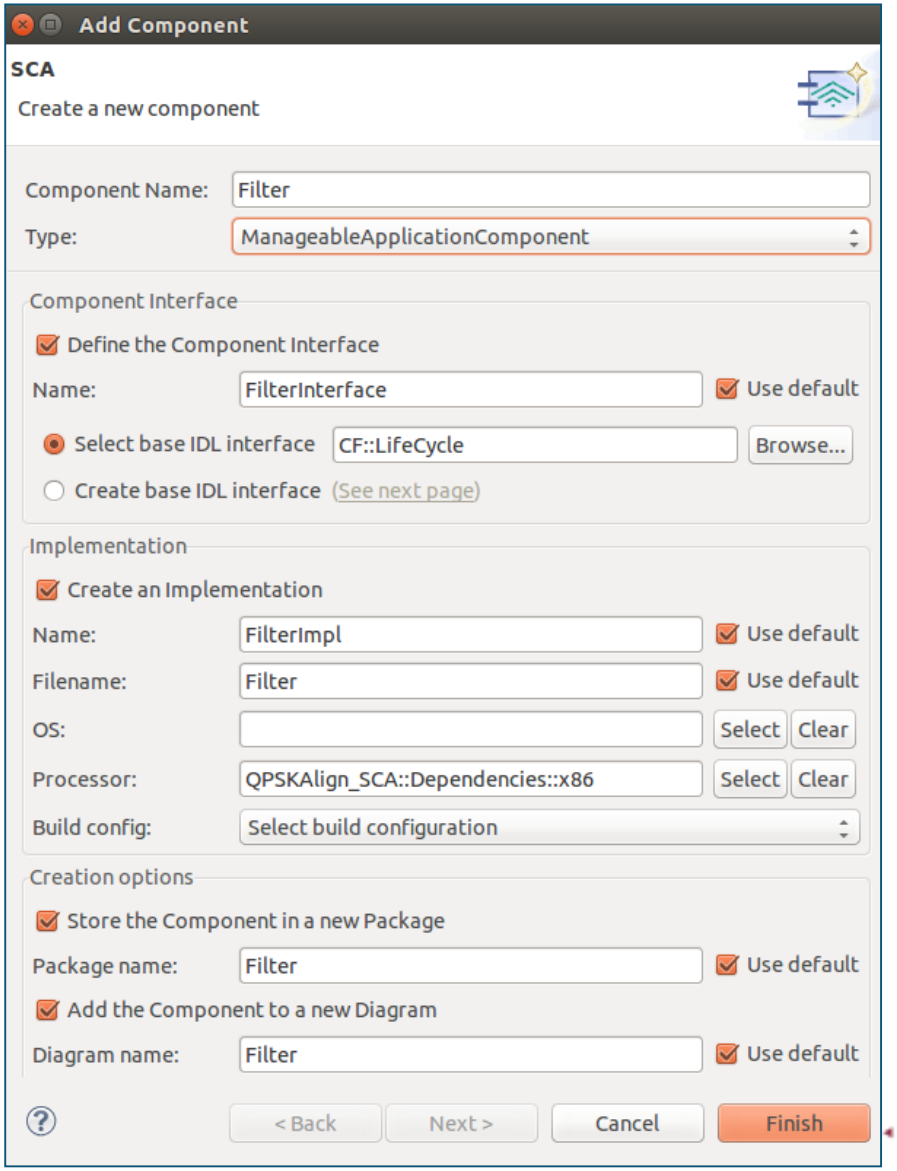
Component wizard …



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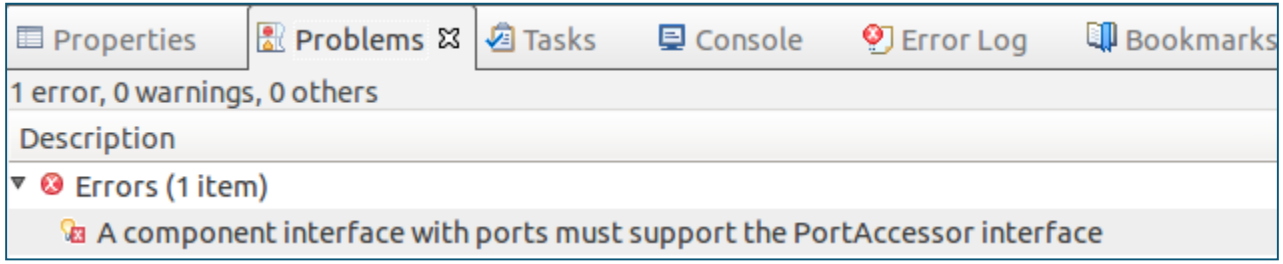
Validation

- Validates model for
  - SCA 4.1 correctness (i.e. controller defined)
  - Semantically correct (i.e. connector connects ports with compatible interfaces)



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XML Generation

- Complete SCA 4.1 domain profile

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE softwareassembly SYSTEM "softwareassembly.dtd">
<softwareassembly name="TopAssembly" sca_version="V4.1">
    <componentfiles>
    <partitioning>
        <assemblyplacement>
            <componentfileref refid="SubAssembly_ae23d6c9-13fb-459c-be44-6d4d50181d8f" />
            <assemblyinstantiation id="DCE:3352767e-5091-46e5-abf3-dfa5c4c773c5">
                <executionaffinityassignments>
                    <executionaffinityassignment
                        componentid="DCE:a63f6534-7da7-4173-b0e8-bc63c6ca7bf9"
                        processcollocation="foo">
                        <coreaffinity>1</coreaffinity>
                        <coreaffinity>2</coreaffinity>
                    </executionaffinityassignment>
                </executionaffinityassignments>
            </assemblyinstantiation>
        </assemblyplacement>
        <hostcollocation id="DCE:e067dc54-6a06-4ba9-b5b0-c9851076f008"
            name="HostCollocation0">
            <componentplacement>
                <componentfileref refid="ACF02_aea09a15-fb87-40fc-abe2-47ffda79e95d" />
                <componentinstantiation id="DCE:551a70c4-1b1d-4ec2-aea0-7704a67ba25b">
                </componentinstantiation>
            </componentplacement>
        </hostcollocation>
        <hostcollocation id="DCE:aba2abcd-8e29-46bd-80b3-66b2f4befc02"
            name="HostCollocation1">
            <componentplacement>
                <componentfileref refid="ACF01_2b8b68a1-4896-427d-a9d7-bfd2d72497ee" />
                <componentinstantiation id="DCE:473bf09c-30a0-4ad8-a4b0-549978c0e2d1">
                </componentinstantiation>
            </componentplacement>
            <componentplacement>
                <componentfileref refid="CompTopA1_37cb1a4c-294c-487e-8679-03ed096543e1" />
                <componentinstantiation id="DCE:13e3f13e-2b29-434d-b8b2-6e29b505d7be">
                </componentinstantiation>
            </componentplacement>
        </hostcollocation>
    </partitioning>
    <assemblycontroller>
        <componentinstantiationref refid="DCE:551a70c4-1b1d-4ec2-aea0-7704a67ba25b" />
        <assemblyinstantiationref refid="DCE:3352767e-5091-46e5-abf3-dfa5c4c773c5" />
    </assemblycontroller>
```

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C++ Code Generation

- Generates code based on UOFs
  - More lightweight. Only necessary code is generated
  - Build environment generated
  - Supports multiple environments

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Model Libraries

- SCA4_IDL – complete SCA 4.1 CF IDL
- SCALibrary – SCA 4.1 IDL resembling SCA 2.2.x IDL (i.e. FullResource)
- SCA Primitives –SCA 4.1 primitive types
- IDL Primitives – CORBA primitives
- SCA Dependencies – OS and Processor dependencies
- JTRS – JTRS IDL referencing SCA 4.1 CF IDL

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UML C++ Class Generation

- Generate UML C++ classes from model representing the C++ generated code
- Used in detailed design
- User defined C++ modeled elements can reference these classes which map to the generated code

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Summary

- Spectra CX 4 is a complete modeling tool for SCA 4.1
- Supports migration and new development
- Has many features and model libraries to assist the user
- Validates and generates C++ and XML

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