Introduction to XML Schema Document (XSD) visualization

Part III: RCE & Eclipse

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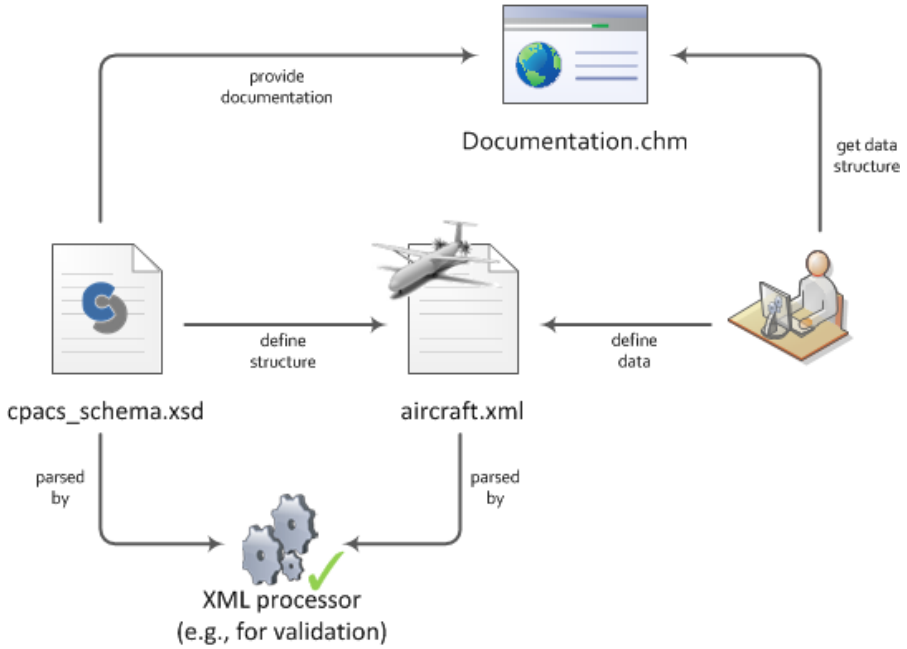
What is a schema?

- A schema* is itself an XML file (**.xsd*), which defines the rules/syntax how a CPACS file (**.xml*) may be structured:
  - how often and in which order may elements appear
  - what is the type of elements (string, double, complex type with sub-elements, etc.)

summarized as *type* of an element

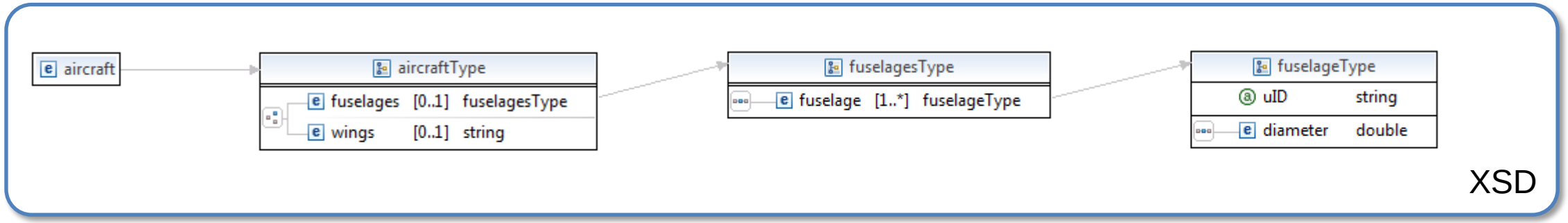


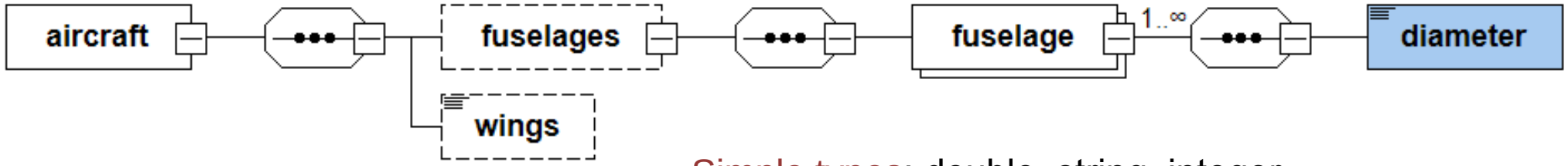

```
- <xsd:complexType name="aircraftType">
  - <xsd:annotation>
    - <xsd:appinfo>
      - <sd:schemaDoc>
        - <ddue:summary>
            <ddue:para>aircraftType</ddue:para>
          </ddue:summary>
        - <ddue:remarks>
            <ddue:para>Aircraft type, containing all the aircraft models</ddue:para>
          </ddue:remarks>
        </sd:schemaDoc>
      </xsd:appinfo>
    </xsd:annotation>
  - <xsd:complexContent>
    - <xsd:extension base="complexBaseType">
      - <xsd:sequence>
          <xsd:element maxOccurs="unbounded" name="model" type="aircraftModelType" />
        </xsd:sequence>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
```

*) in IT called *schema* and not *scheme*..

What are elements and types?

Simplified example similar to CPACS





- Simple types: double, string, integer …
- Complex types: specify sub-elements and attributes of elements

  → used to build hierarchical structure

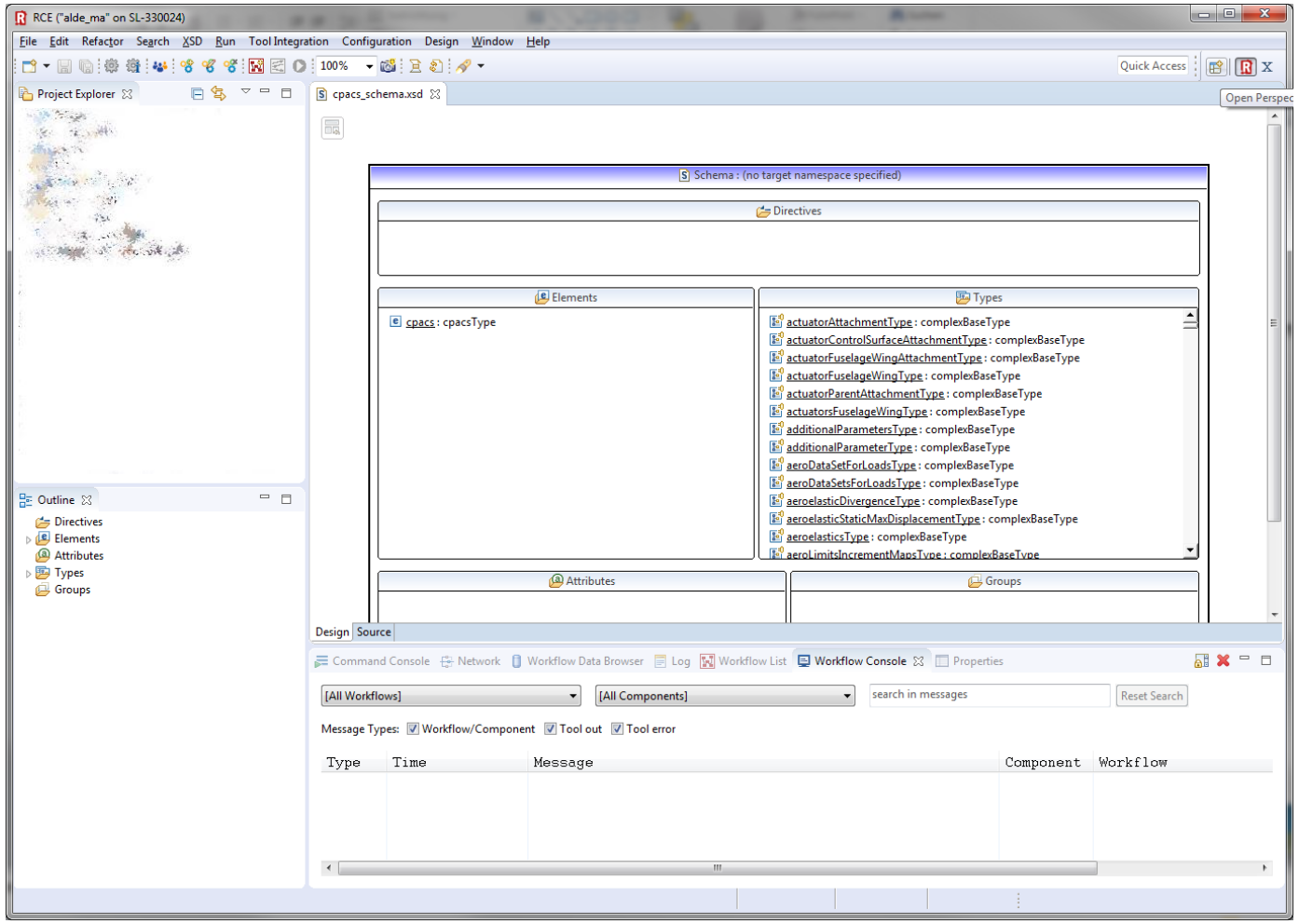
HTML documentation

- Download on of the tools below and follow the corresponding installation instructions:
  - RCE: https://rcenvironment.de/pages/download.html
  - Eclipse (choose a package with XML Editor, e.g. Java IDE): https://www.eclipse.org/downloads/packages/

- Download the CPACS schema file (*.xsd*):
  - https://cpacs.de/pages/download.html
  - e.g.: https://www.cpacs.de/schema/v3_2_0/cpacs_schema.xsd

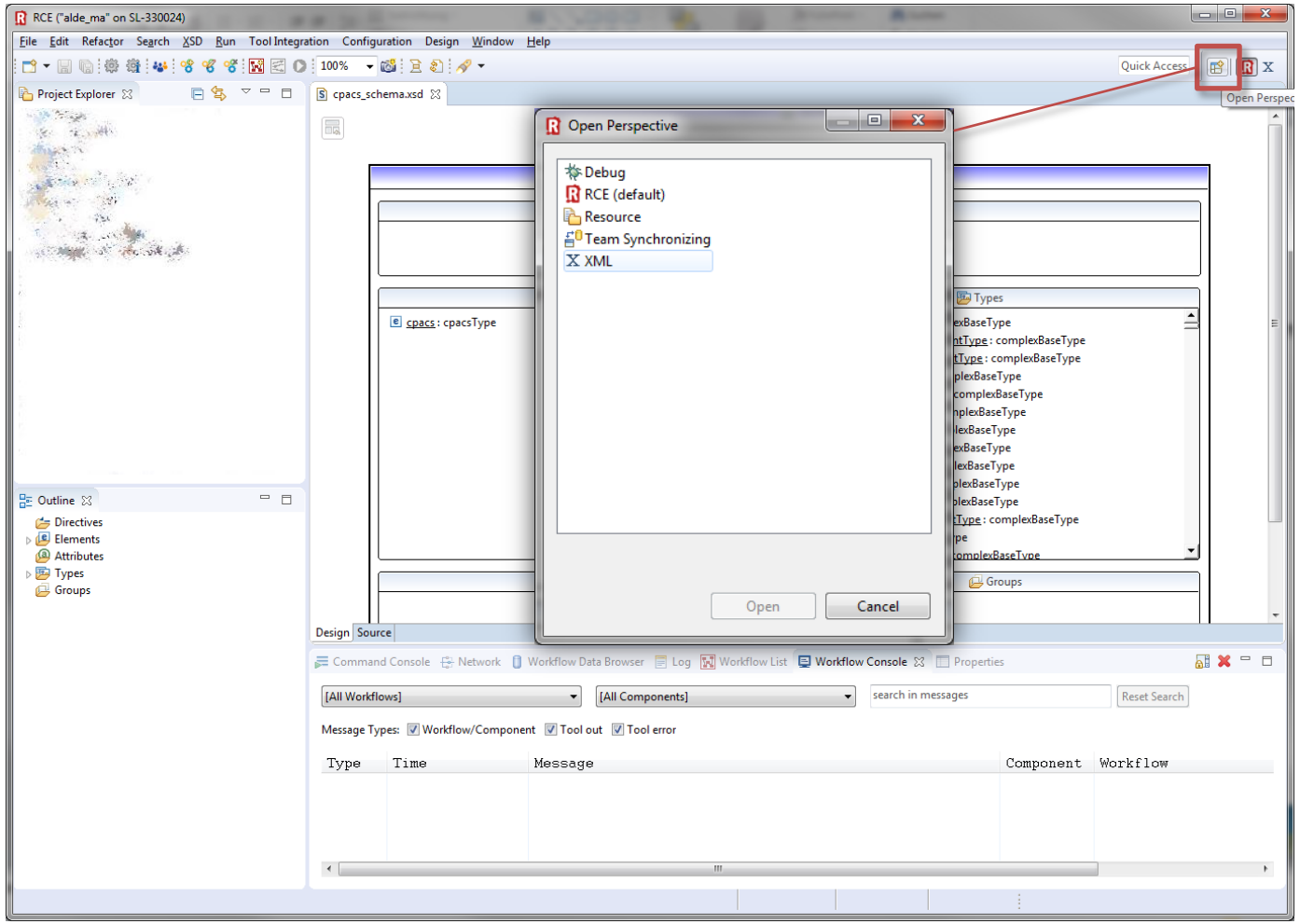
- RCE is based on the Eclipse framework → following examples are based on RCE

HTML documentation



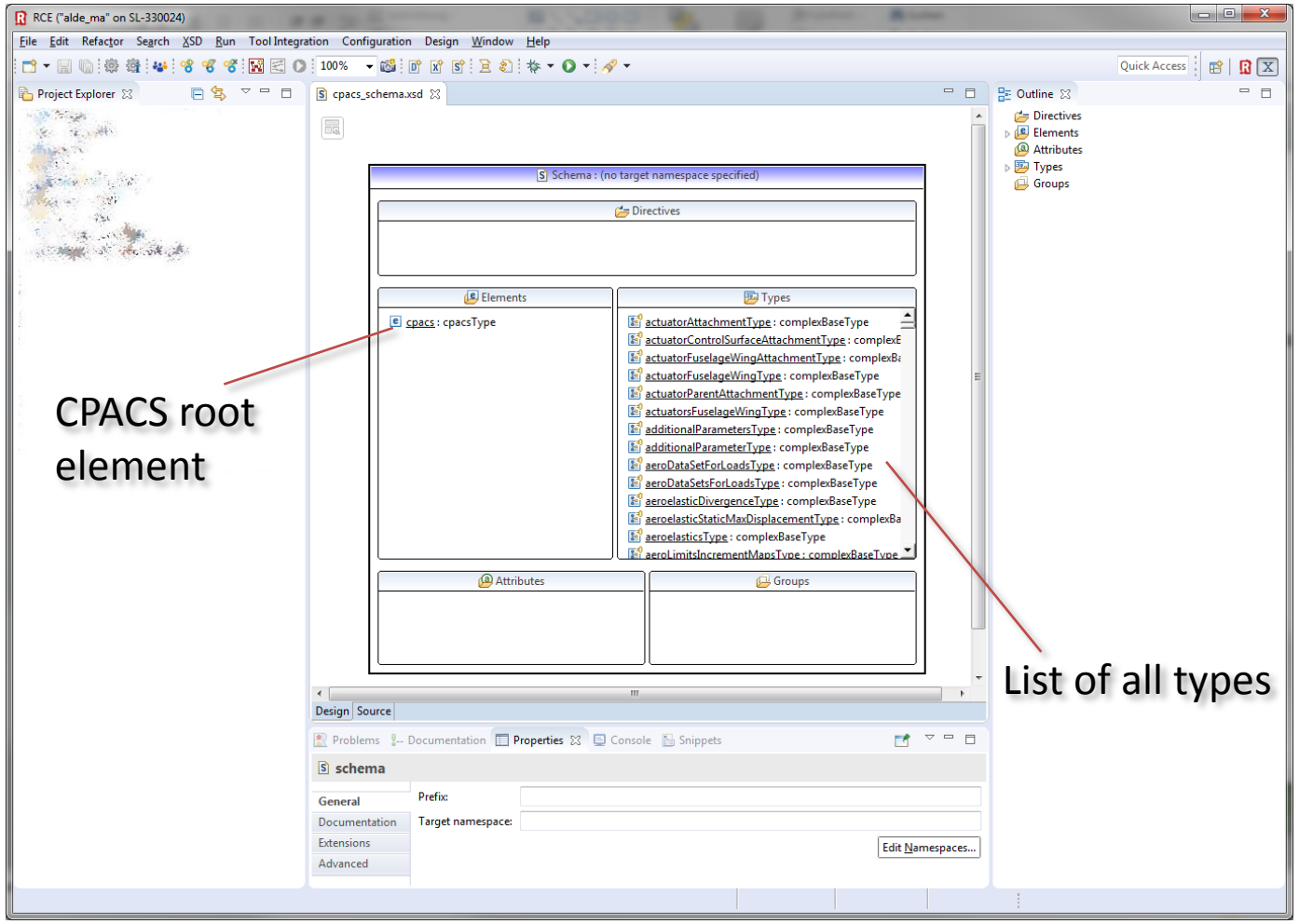
- Open RCE and import the *xsd* file
  - *File → Open File… → cpacs_schema.xsd*

HTML documentation



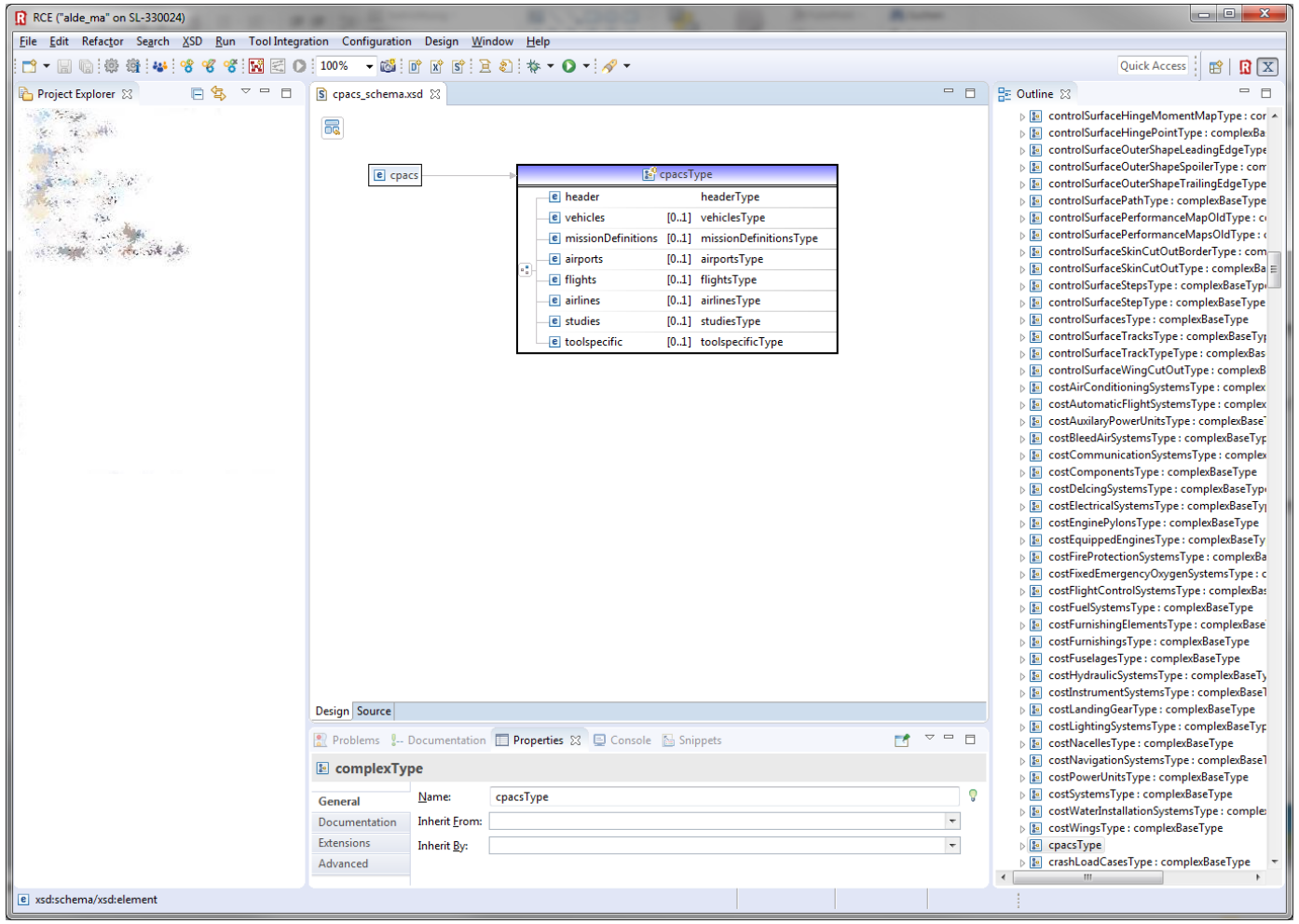
- Open RCE and import the *xsd* file
  - *File → Open File… → cpacs_schema.xsd*
- It might be more convenient to switch to XML perspective

HTML documentation



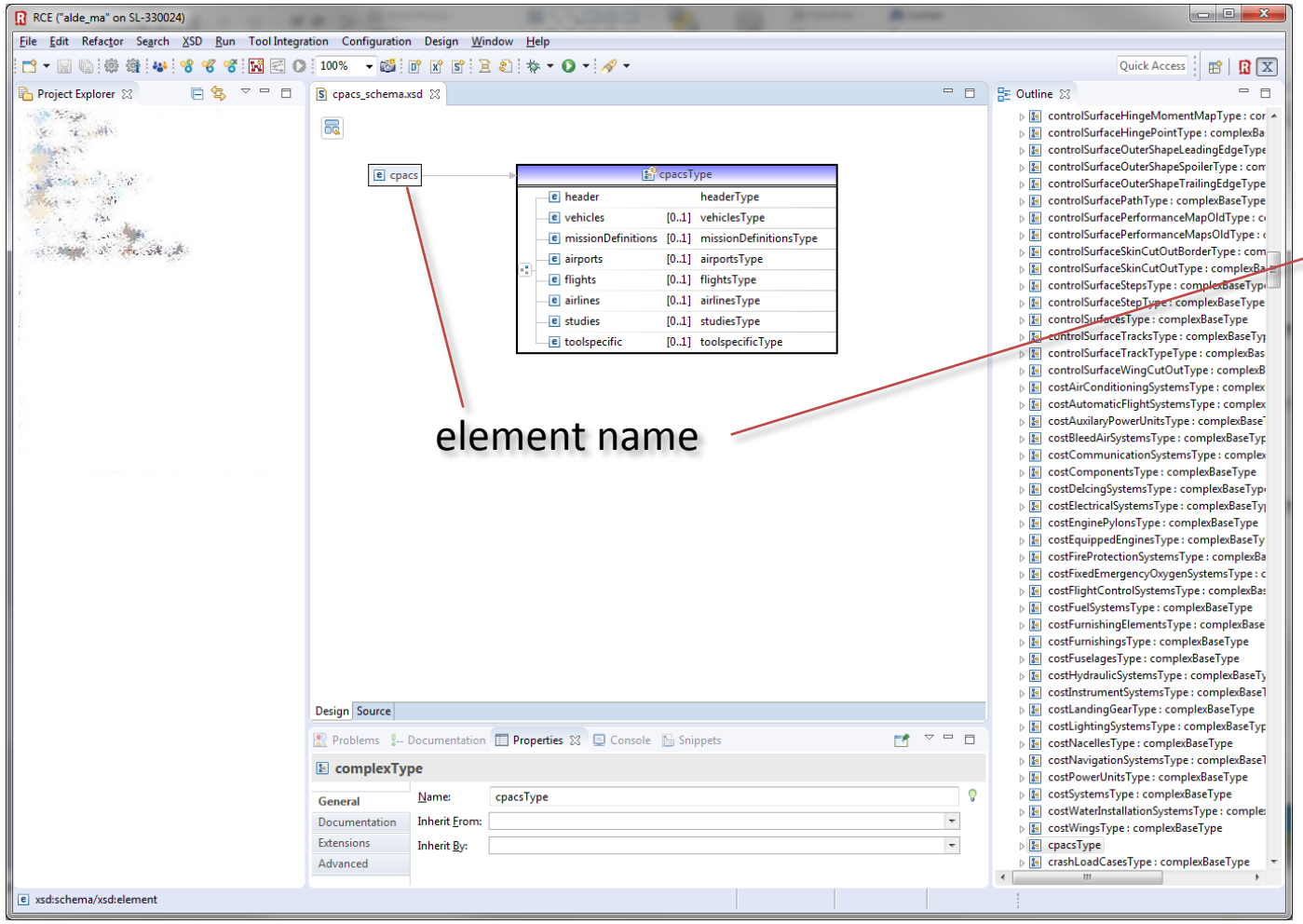
- Open RCE and import the *xsd* file
  - *File → Open File… → cpacs_schema.xsd*
- It might be more convenient to switch to XML perspective
- Double click on the CPACS root element

HTML documentation

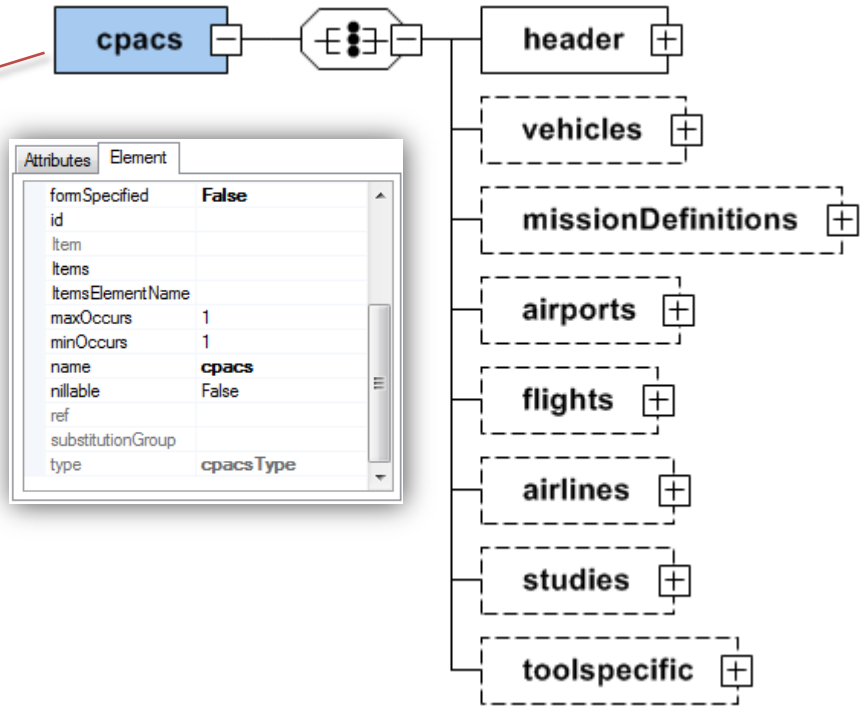


- Double click on the CPACS root element
  - → type of the root element (*cpacsType*) opens
  - it is a complex type, i.e. containing sub-elements

HTML documentation

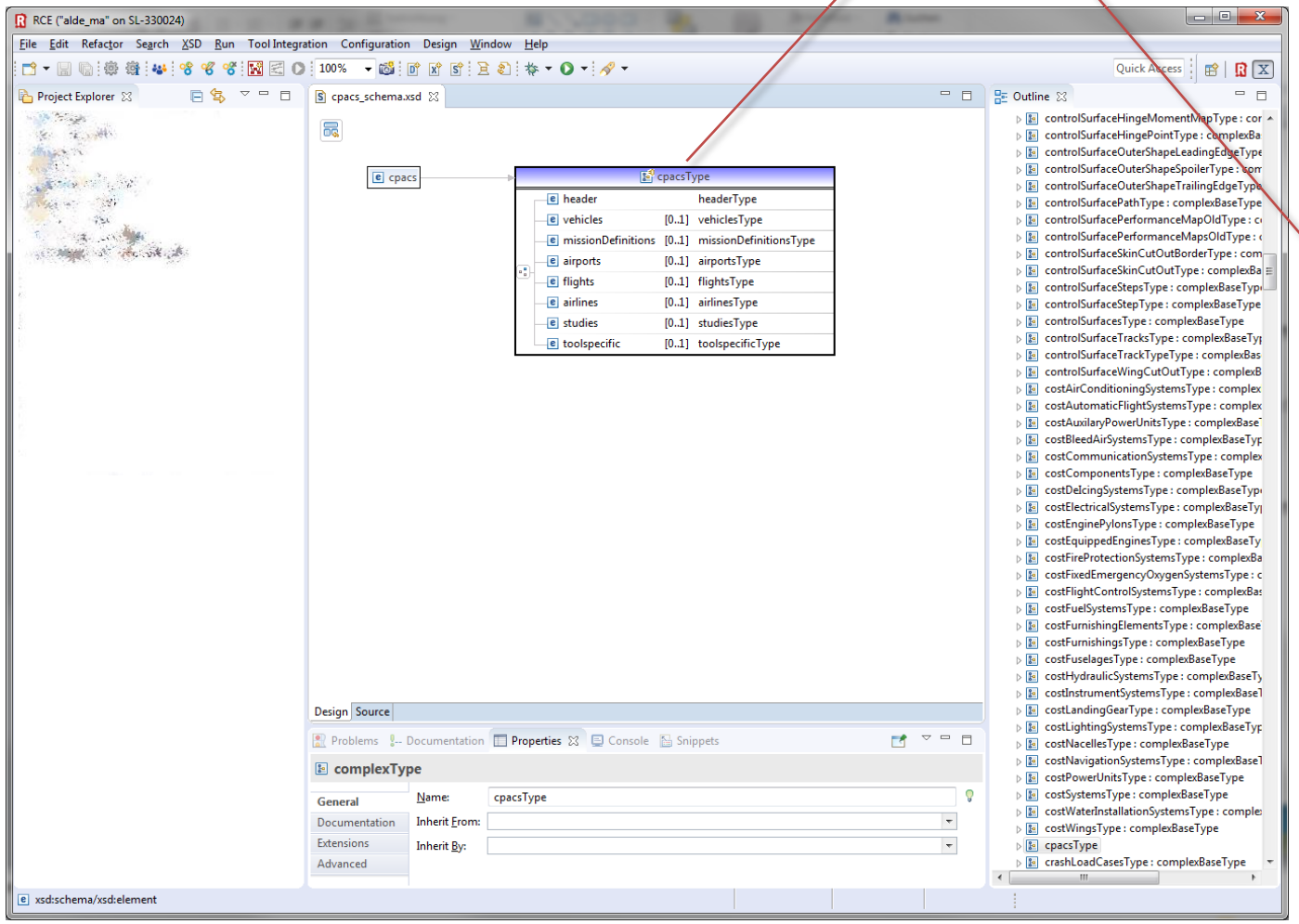


- Compare with XSD Diagram introduced in part I of this tutorial:



HTML documentation

type of the element



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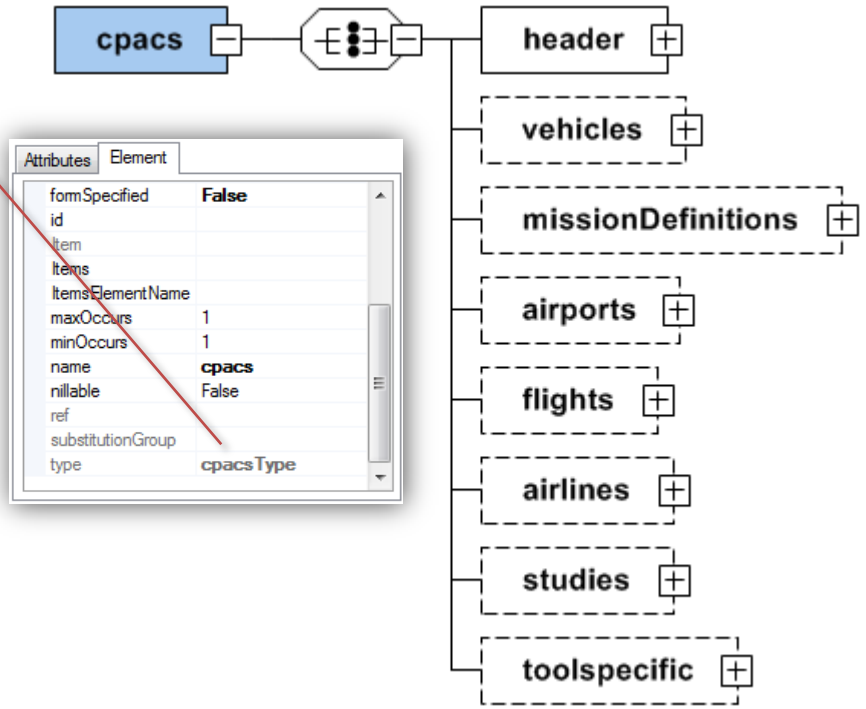
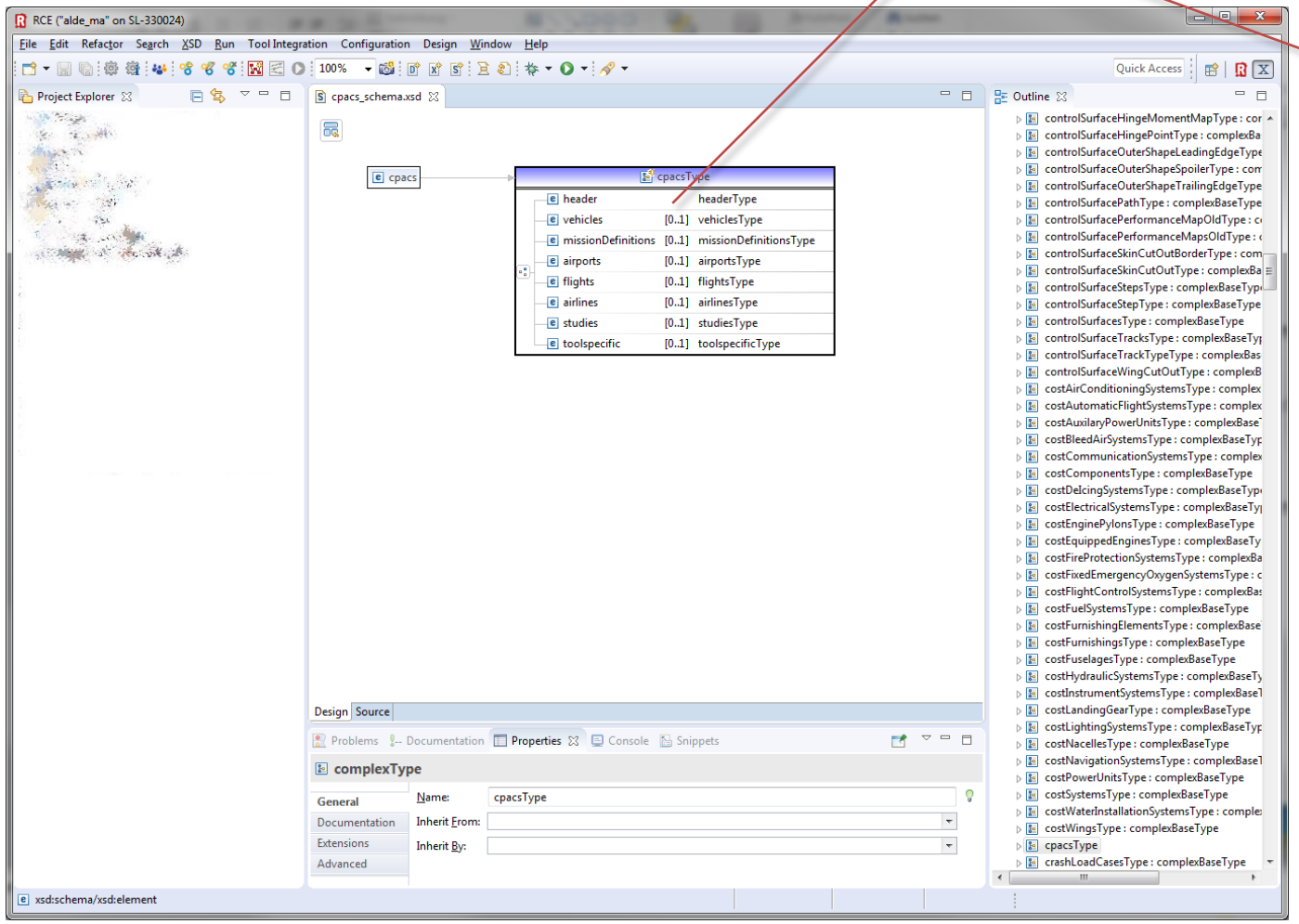


HTML documentation

occurence of the child elements



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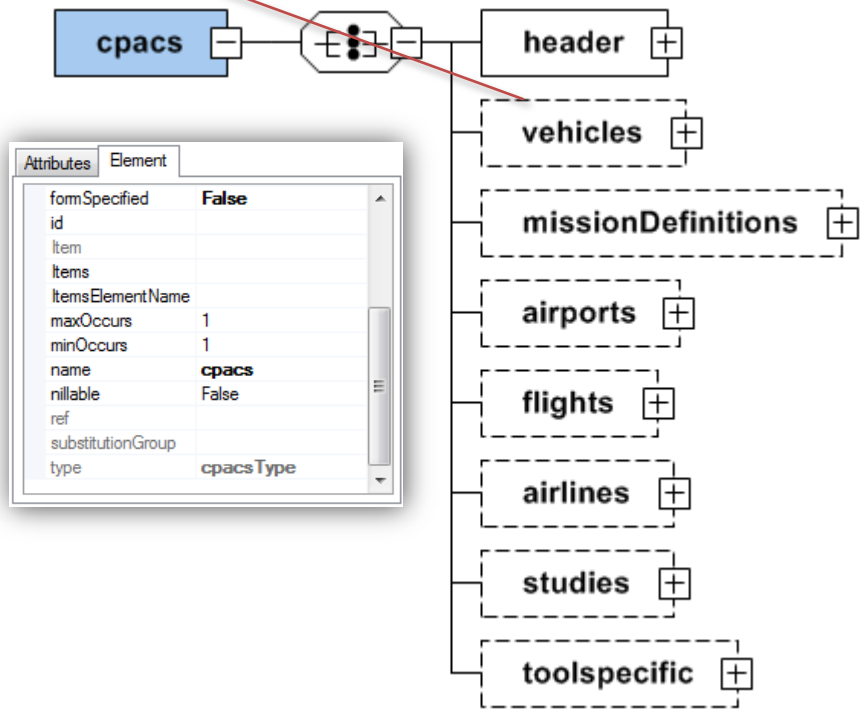
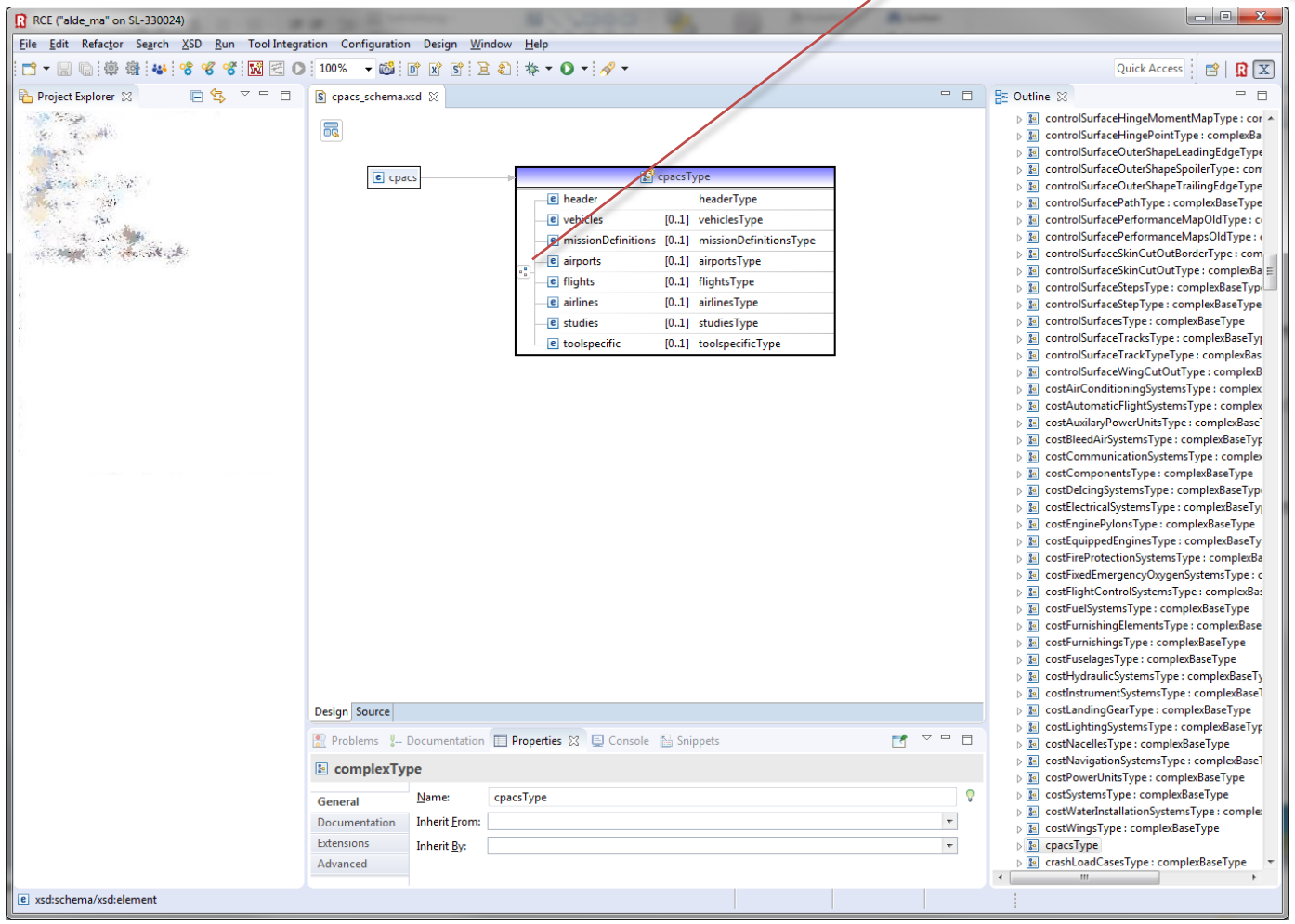


HTML documentation

order of appearance
of the child elements



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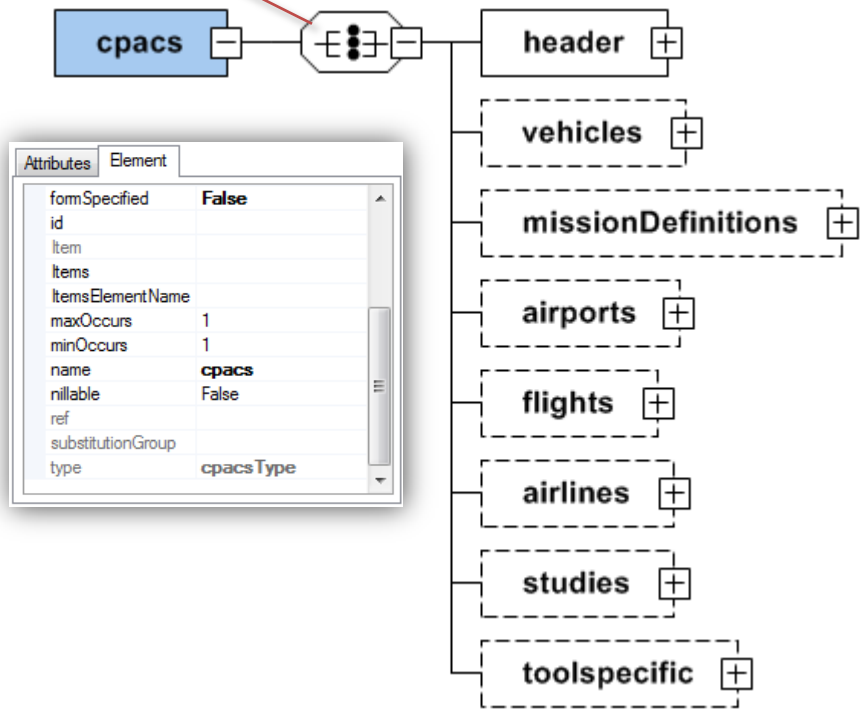

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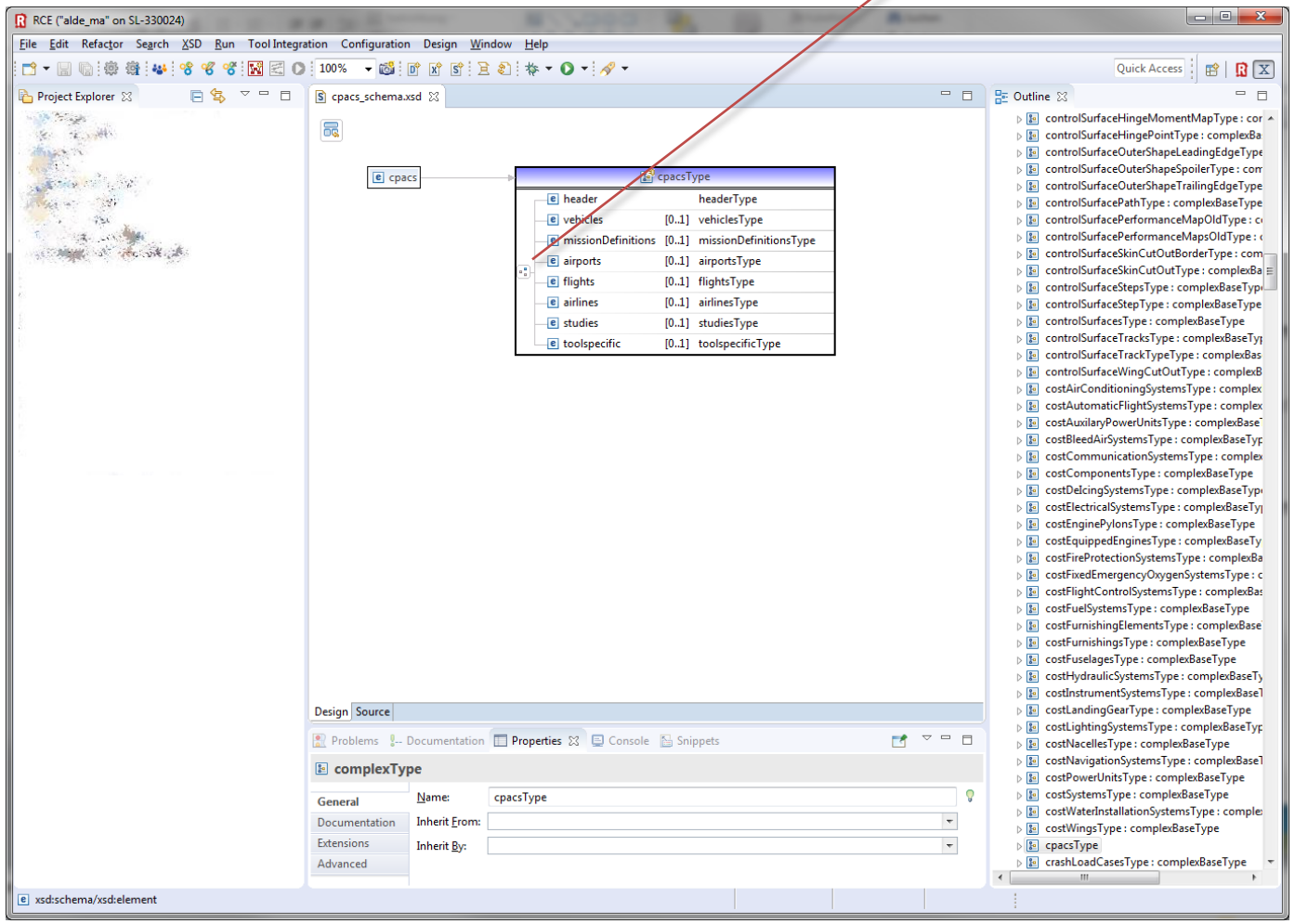

- Sequence is arbitrary (i.e. it does not matter whether *aircraft* is specified first and then *engines* or vice versa)

- Sequence must correspond to the representation in the XSD diagram

- Only one of the nodes may be specified (=*choice element*):