Generating an XML Schema from Java Classes

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Overview

The Schemagen Tool

Generating a Schema Programmatically

Named and Anonymous Types

Making Elements and Attributes Required

Specifying Default Values

Making Elements Nillable

Distinguishing Between Absent and Nillable Elements

Generating a Schema Using the Schemagen Tool

The Schemagen Tool

- JAXB tools included with the JDK
- Schemagen: generate an XSD from Java domain model classes

`ps-jaxb-12-schemagen`

Generating a Schema Programmatically

Generating a Schema Programmatically

- **Method:** `JAXBContext.generateSchema()`

ps-jaxb-13-generateschema

Generating Named and Anonymous Types

Generating Named and Anonymous Types

- **More features of the `@XmlType` annotation**

`ps-jaxb-14-xmltype`

Making Elements and Attributes Required

Making Elements and Attributes Required

- Use `@XmlElement` and `@XmlAttribute` to specify if an element or attribute is required

`ps-jaxb-15-required`

Specifying Default Values for Elements and Attributes

Specifying Default Values

- Use `@XmlElement` to specify a default value for an element
- Possibilities for specifying a default value for attributes

`ps-jaxb-16-defaultvalue`

Marshalling Null Values

1. JAXB: null = no value = no XML element

2. XML Schema:
   - no element = no default value
   - empty element = default value

Making Elements Nillable

Making Elements Nillable

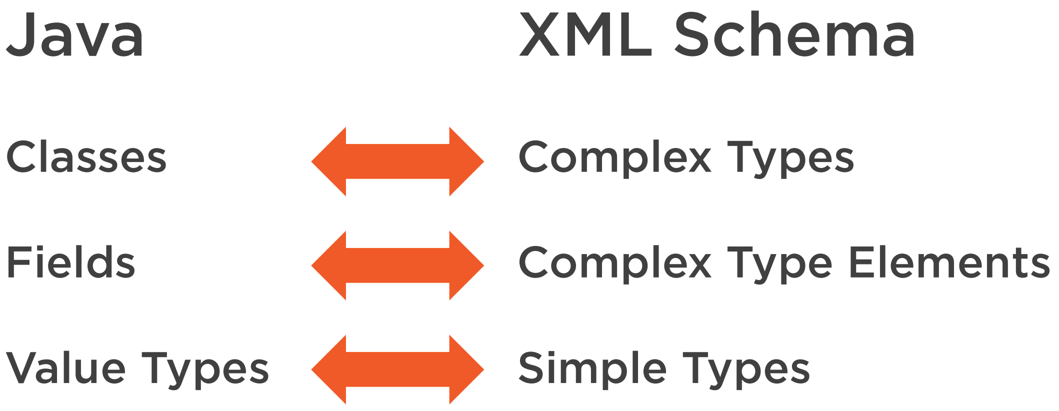
- Different ways in which an element has no value
  - Element not present in XML
  - Element present but empty
  - Element is set to “nil”

```
<comment xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:nil="true"/>
```

ps-jaxb-17-nillable

Distinguishing Between Absent and Nillable Elements

Absent and Nillable Elements

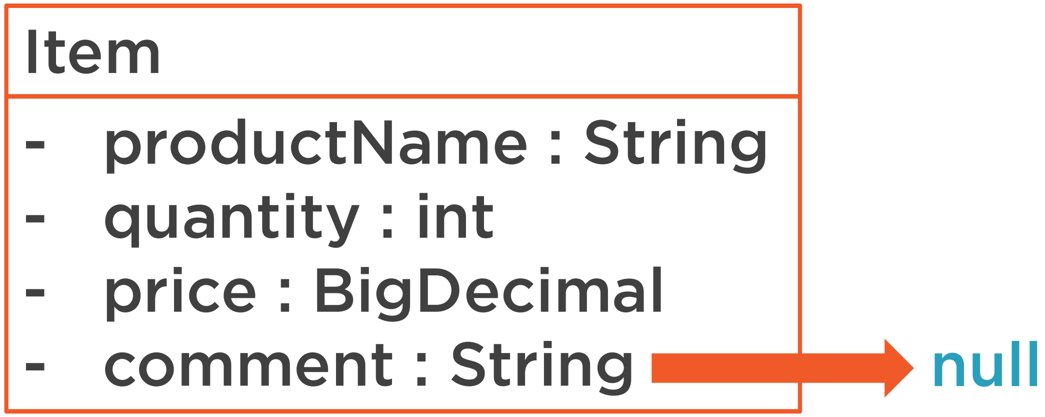


Java	XML Schema
Classes	Complex Types
Fields	Complex Type Elements
Value Types	Simple Types

Absent and Nillable Elements

XML		Java
Element not present	⟷	Field is set to “null”
Element present but empty	⟷	???
Element is set to “nil”	⟷	???

Absent and Nillable Elements



Item

- productName : String
- quantity : int
- price : BigDecimal
- comment : String

null

ps-jaxb-18-objectfactory

Absent and Nillable Elements

JAXBElement<T>

- name : QName
- value : T
- nil : boolean

`ps-jaxb-18-objectfactory`

Absent and Nillable Elements

XML		Java
Element not present	↔	Field is set to “null”
Element is set to “nil”	↔	Field is set to JAXBElement with nil == true

Summary

Generating a Schema

- Using the schemagen tool
- Using JAXBContext.generateSchema

@XmlType

- Named and anonymous types

Required, Default Value, Nillable

Mapping a Field as a JAXBElement

- Class ObjectFactory

Coming Up

The Schema-first Approach