Tweak Your Modules!

Java Platform Module System

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GK SOFTWARE

Simply Retail.

JDT embraces Java™ 9 / Part II

We've all migrated to Java 11

From here
adopting new Java versions
is a breeze

Compatibility for all!

… and live happily ever after …

JDT embraces Java™ 9 / Part II

We've all migrated to Java 11

```
 6 import javax.xml.parsers.ParserConfigurationException;
 7 import javax.xml.parsers.SAXParser;
 8 import javax.xml.parsers.SAXParserFactory;
 9
10 import org.xml.sa
11 import org.xml.sa
12
```

The package javax.xml.parsers is accessible from more than one module: <unnamed>, java.xml

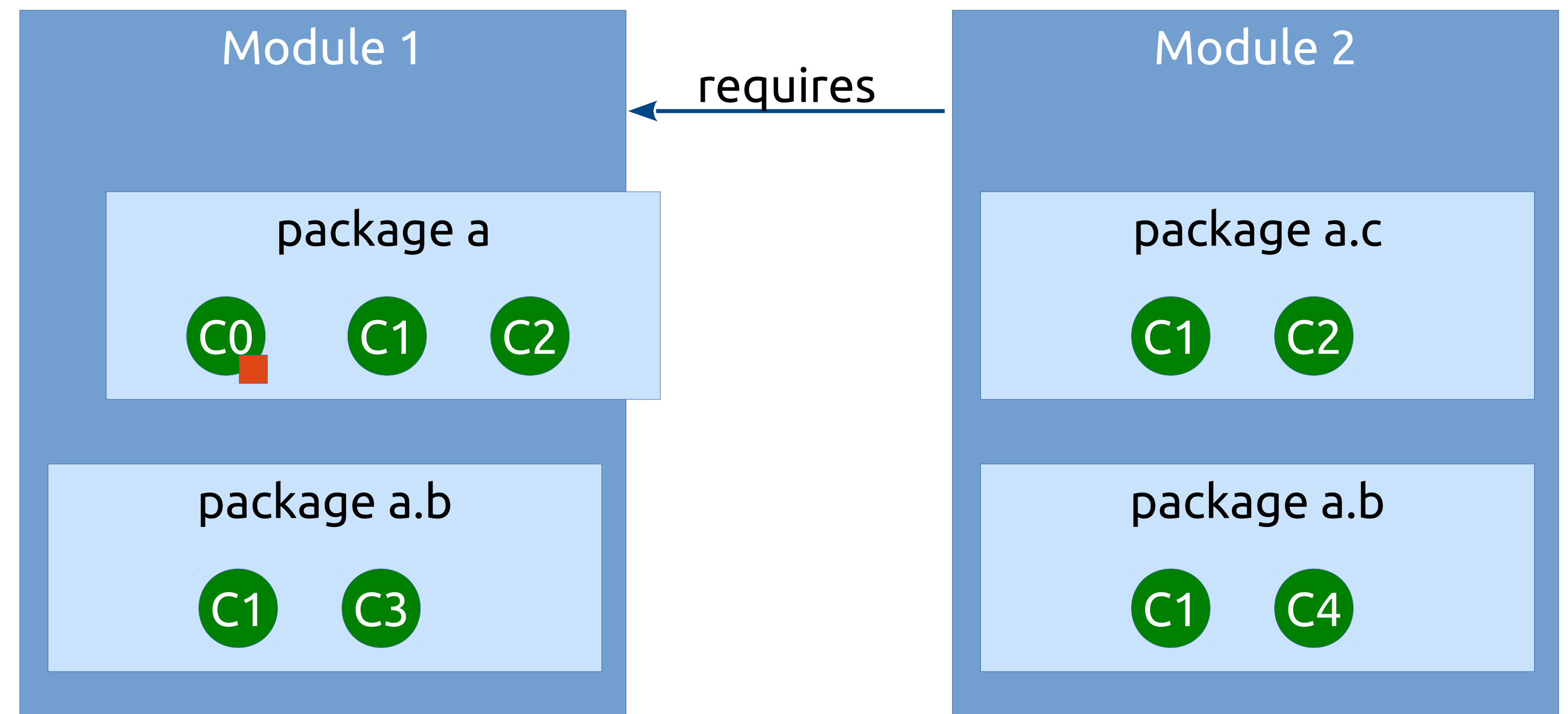
Compatibility for all!

... and live happily ever after ...

Some Modules are More Equal than Others

- Named modules
  - System modules
    - part of JRE, implicitly available (not all!)
  - Regular modules
    - user defined
    - have module-info
  - Automatic modules
    - user defined
    - no module-info
- Unnamed module
  - All the rest – “legacy”

Wiring à la JPMS:



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All Java9+ programs use modules, perhaps unknowingly.

Demo java.xml:
Conflicting Modules

Targets are Moving

module-info.class

LearningJava9 ▸ /home/java/jdk-9/lib/jrt-fs.jar ▸ java.corba

```
/**
 * Defines the Java binding of the OMG CORBA APIs, and the RMI-I
 *
 * <p> This module is upgradeable.
 *
 * @moduleGraph
 * @since 9
 */
@Deprecated(since="9", forRemoval=true)
module java.corba {
    requires java.logging;
    requires java.naming;
    requires java.transaction;
    requires jdk.unsupported;
```

JEP 320

Remove the Java EE and CORBA Modules

- What if your CORBA application should run on Java 9 and Java 11?

JEP 320

“In Java SE 9, the Java SE modules that contain **Java EE** and **CORBA** technologies are annotated as **deprecated for removal**,
indicating the intent to remove them in a future release:

- java.xml.ws (JAX-WS, [...] SAAJ and Web Services Metadata)
- java.xml.bind (JAXB)
- java.activation (JAF)
- java.xml.ws.annotation (Common Annotations)
- java.corba (CORBA)
- java.transaction (JTA)”

“Related modules in Java SE 9 are also
deprecated for removal:

- java.se.ee (Aggregator module for the six modules above)
- jdk.xml.ws (Tools for JAX-WS)
- jdk.xml.bind (Tools for JAXB)”

“This JEP will remove the nine modules listed above” – Fix Version/s: 11

Options for using JAXB

- Java 9, named module
  - Just require java.xml.bind
  - Put jaxb-api.jar on the modulepath
    1) **remove** system module
    2) add jaxb-api.jar to modulepath
- Java 9, unnamed module
  - Put jaxb-api.jar on the classpath
  - **Add** system module java.xml.bind
- Java 11+
  - Put jaxb-api.jar on the classpath / modulepath
  - There is no option 2

java.xml.bind
- exists as a system module
- deprecated for removal
- not visible by default to unnamed module

java.xml.bind
- no longer a system module

Options for using JAXB

JEP 320:
"Since deprecating modules for removal merely causes compile-time warnings,
JDK 9 **took a more robust step** to prepare developers for the actual removal of these modules in a future release:
The modules are not resolved in JDK 9 when code on the class path is compiled or run.
This allows developers on JDK 9 to deploy standalone versions of the Java EE and CORBA technologies on the **class path**,
just like on JDK 8. "

"Alternatively, developers on JDK 9 can use the --add-modules flag on the command line
to resolve the modules in the JDK runtime image."

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Defining a Modular Application

- Language: module-info.java
  - module
  - Directives: requires, exports, opens, provides, uses
    - to, with
  - Modifiers: open, transitive
- Command line options
  - --add-modules
  - …
  -

Demo java.xml.bind:
Module Goes Missing

Eclipse UI ↔ Command Line

- Eclipse: **Java Build Path** > **Module Dependencies** > **All Modules**
  - Add System Module → additionally adds required modules
  - Remove → additionally removes requiring modules
- Command Line
  - `--add-modules` → need to **completely** enumerate all additional modules
  - `--limit-modules` → supports **minimal** form – will keep the transitive closure of listed modules
- To observe the correspondence: **Show JPMS Options …**

The Case of Tests

- Modular project
- Main & test sources separated
  - test sources marked (Thanks to Till Brychcy)
- JUnit on the classpath
- Eclipse implicitly adds these tweaks for running tests:
  - --add-opens my.mod/test.pack=ALL-UNNAMED
  - --add-reads my.mod=ALL-UNNAMED
  - --add-modules=ALL-MODULE-PATH
  - --patch-module my.mod=/path/to/MyProject/bin-test

Undeclared Dependencies

Demo:
Modular Tests

Knobs & Dials

- module-info.java
  - intrinsic properties
- Java Build Path
  - determine set of **observable** modules
  - superimpose more **edges** onto the **module graph**
  - just during building of this project
- Launch Configuration
  - initialized from Java Build Path
  - superimpose more **edges** onto the **module graph**
  - determine the set of **root** modules
- Special modules names
  - add-modules: ALL-SYSTEM, ALL-DEFAULT, ALL-MODULE-PATH
  - add-reads, add-exports, add-opens: ALL-UNNAMED