

# JPMS (Java 9 and beyond)

- [Introduction](#)
- [Automatic-Module-Name](#)
- [Example Usage](#)

## Introduction

One of the major features introduced along with Java 9 release is **JPMS**: Java Platform Module System. As of now, Apache CXF modules are not built / released as Java modules however the work in this direction has been started.

## Automatic-Module-Name

Starting from **3.2.5** release, all Apache CXF modules contain the **Automatic-Module-Name** manifest entry in order to provide stable and convenient way to reference them from the descriptors of the modular (JPMS-based) Java applications. The list of the modules and their **Automatic-Module-Name** is presented below.

The naming scheme has been adopted following the Stephen Colebourne recommendations (<http://blog.joda.org/2017/04/java-se-9-jpms-module-naming.html>) and based on package name.

Test Module	Automatic-Module-Name
cxf-distribution-manifest- <b>&lt;version&gt;</b> .jar	org.apache.cxf.manifest
cxf-bundle-compatible- <b>&lt;version&gt;</b> .jar	org.apache.cxf.bundle
cxf-codegen-plugin- <b>&lt;version&gt;</b> .jar	org.apache.cxf.plugin.codegen
cxf-corbatools-maven-plugin- <b>&lt;version&gt;</b> .jar	org.apache.cxf.plugin.corbatools
cxf-core- <b>&lt;version&gt;</b> .jar	org.apache.cxf.core
cxf-distribution-javadoc- <b>&lt;version&gt;</b> .jar	org.apache.cxf.javadoc
cxf-integration-cdi- <b>&lt;version&gt;</b> .jar	org.apache.cxf.cdi
cxf-integration-jca- <b>&lt;version&gt;</b> .jar	org.apache.cxf.jca
cxf-integration-tracing-brave- <b>&lt;version&gt;</b> .jar	org.apache.cxf.tracing.brave
cxf-integration-tracing-htrace- <b>&lt;version&gt;</b> .jar	org.apache.cxf.tracing.htrace
cxf-integration-tracing-opentracing- <b>&lt;version&gt;</b> .jar	org.apache.cxf.tracing.opentracing
cxf-java2swagger-plugin- <b>&lt;version&gt;</b> .jar	org.apache.cxf.plugin.java2swagger
cxf-java2wadi-plugin- <b>&lt;version&gt;</b> .jar	org.apache.cxf.plugin.java2wadi
cxf-java2ws-plugin- <b>&lt;version&gt;</b> .jar	org.apache.cxf.plugin.java2ws
cxf-karaf-commands- <b>&lt;version&gt;</b> .jar	org.apache.cxf.karaf.commands
cxf-rt-bindings-coloc- <b>&lt;version&gt;</b> .jar	org.apache.cxf.binding.coloc
cxf-rt-bindings-corba- <b>&lt;version&gt;</b> .jar	org.apache.cxf.binding.corba
cxf-rt-bindings-soap- <b>&lt;version&gt;</b> .jar	org.apache.cxf.binding.soap
cxf-rt-bindings-xml- <b>&lt;version&gt;</b> .jar	org.apache.cxf.binding.xml
cxf-rt-databinding-aegis- <b>&lt;version&gt;</b> .jar	org.apache.cxf.databinding.aegis
cxf-rt-databinding-jaxb- <b>&lt;version&gt;</b> .jar	org.apache.cxf.databinding.jaxb
cxf-rt-features-clustering- <b>&lt;version&gt;</b> .jar	org.apache.cxf.clustering
cxf-rt-features-logging- <b>&lt;version&gt;</b> .jar	org.apache.cxf.logging
cxf-rt-features-metrics- <b>&lt;version&gt;</b> .jar	org.apache.cxf.metrics
cxf-rt-features-throttling- <b>&lt;version&gt;</b> .jar	org.apache.cxf.throttling
cxf-rt-frontend-jaxrs- <b>&lt;version&gt;</b> .jar	org.apache.cxf.frontend.jaxrs

cxfrtfrontendjaxws-<version>.jar	org.apache.cxf.frontend.jaxws
cxfrtfrontendjs-<version>.jar	org.apache.cxf.frontend.js
cxfrtfrontend-simple-<version>.jar	org.apache.cxf.frontend.simple
cxfrt-javascript-3.2.5-<version>.jar	org.apache.cxf.js
cxfrt-javascript-tests-<version>.jar	org.apache.cxf.js.tests
cxfrt-management-<version>.jar	org.apache.cxf.management
cxfrt-rs-client-<version>.jar	org.apache.cxf.rs.client
cxfrt-rs-extension-providers-<version>.jar	org.apache.cxf.rs.provider
cxfrt-rs-extension-reactivestreams-<version>.jar	org.apache.cxf.rs.reactivestreams
cxfrt-rs-extension-reactor-<version>.jar	org.apache.cxf.rs.reactor
cxfrt-rs-extension-rx2-<version>.jar	org.apache.cxf.rs.rx2
cxfrt-rs-extension-rx-<version>.jar	org.apache.cxf.rs.rx
cxfrt-rs-extension-search-<version>.jar	org.apache.cxf.rs.search
cxfrt-rs-http-sci-<version>.jar	org.apache.cxf.rs.sci
cxfrt-rs-json-basic-<version>.jar	org.apache.cxf.rs.json
cxfrt-rs-mp-client-<version>.jar	<a href="http://org.apache.cxf.rs.client.mp">org.apache.cxf.rs.client.mp</a>
cxfrt-rs-security-cors-<version>.jar	org.apache.cxf.rs.security.cors
cxfrt-rs-security-jose-<version>.jar	org.apache.cxf.rs.security.jose
cxfrt-rs-security-jose-jaxrs-<version>.jar	org.apache.cxf.rs.security.jose.jaxrs
cxfrt-rs-security-oauth2-<version>.jar	org.apache.cxf.rs.security.oauth2
cxfrt-rs-security-oauth2-saml-<version>.jar	org.apache.cxf.rs.security.oauth2.saml
cxfrt-rs-security-oauth-<version>.jar	org.apache.cxf.rs.security.oauth
cxfrt-rs-security-sso-oidc-<version>.jar	org.apache.cxf.rs.security.sso.oidc
cxfrt-rs-security-sso-saml-<version>.jar	org.apache.cxf.rs.security.sso.saml
cxfrt-rs-security-xml-<version>.jar	org.apache.cxf.rs.security.xml
cxfrt-rs-service-description-<version>.jar	org.apache.cxf.rs.wadl
cxfrt-rs-service-description-openapi-v3-<version>.jar	org.apache.cxf.rs.openapi.v3
cxfrt-rs-service-description-swagger-<version>.jar	org.apache.cxf.rs.swagger
cxfrt-rs-service-description-swagger-ui-<version>.jar	org.apache.cxf.rs.swagger.ui
cxfrt-rs-sse-<version>.jar	org.apache.cxf.rs.sse
cxfrt-security-<version>.jar	org.apache.cxf.security
cxfrt-security-saml-<version>.jar	org.apache.cxf.security.saml
cxfrt-transport-http-<version>.jar	org.apache.cxf.transport.http
cxfrt-transport-http-hc-<version>.jar	org.apache.cxf.transport.http.hc
cxfrt-transport-http-jetty-<version>.jar	org.apache.cxf.transport.http.jetty
cxfrt-transport-http-netty-client-<version>.jar	org.apache.cxf.transport.http.netty.client
cxfrt-transport-http-netty-server-<version>.jar	org.apache.cxf.transport.http.netty.server
cxfrt-transport-http-undertow-<version>.jar	org.apache.cxf.transport.http.undertow
cxfrt-transport-jms-<version>.jar	org.apache.cxf.transport.jms
cxfrt-transport-local-<version>.jar	org.apache.cxf.transport.local

cxfrt-transport-udp-<version>.jar	org.apache.cxf.transport.udp
cxfrt-transport-websocket-<version>.jar	org.apache.cxf.transport.websocket
cxfrt-ws-addr-<version>.jar	<a href="#">org.apache.cxf.ws.addr</a>
cxfrt-wsdl-<version>.jar	org.apache.cxf.wsdl
cxfrt-ws-eventing-<version>.jar	<a href="#">org.apache.cxf.ws.eventing</a>
cxfrt-ws-mex-<version>.jar	<a href="#">org.apache.cxf.ws.mex</a>
cxfrt-ws-policy-<version>.jar	<a href="#">org.apache.cxf.ws.policy</a>
cxfrt-ws-rm-<version>.jar	<a href="#">org.apache.cxf.ws.rm</a>
cxfrt-ws-security-<version>.jar	<a href="#">org.apache.cxf.ws.security</a>
cxfrt-ws-transfer-<version>.jar	<a href="#">org.apache.cxf.ws.transfer</a>
cxfservices-sts-core-<version>.jar	org.apache.cxf.sts.core
cxfservices-ws-discovery-api-<version>.jar	<a href="#">org.apache.cxf.ws.discovery</a>
cxfservices-ws-discovery-service-<version>.jar	<a href="#">org.apache.cxf.ws.discovery.service</a>
cxfservices-wsn-api-<version>.jar	org.apache.cxf.wsn
cxfservices-wsn-core-<version>.jar	org.apache.cxf.wsn.core
cxfservices-wsn-osgi-<version>.jar	org.apache.cxf.wsn.osgi
cxfservices-xkms-client-<version>.jar	org.apache.cxf.xkms.client
cxfservices-xkms-common-<version>.jar	org.apache.cxf.xkms.common
cxfservices-xkms-itests-<version>.jar	org.apache.cxf.xkms.itests
cxfservices-xkms-osgi-<version>.jar	org.apache.cxf.xkms.osgi
cxfservices-xkms-service-<version>.jar	org.apache.cxf.xkms.service
cxfservices-xkms-x509-handlers-<version>.jar	org.apache.cxf.xkms.x509.handlers
cxfservices-xkms-x509-repo-ldap-<version>.jar	org.apache.cxf.xkms.x509.ldap
cxfspring-boot-autoconfigure-<version>.jar	org.apache.cxf.spring.boot.autoconfigure
cxfspring-boot-starter-jaxrs-<version>.jar	org.apache.cxf.spring.boot.jaxrs
cxfspring-boot-starter-jaxws-<version>.jar	org.apache.cxf.spring.boot.jaxws
cxftestutils-<version>.jar	org.apache.cxf.testutils
cxftools-common-<version>.jar	org.apache.cxf.tools.common
cxftools-corba-<version>.jar	org.apache.cxf.tools.corba
cxftools-java2ws-<version>.jar	org.apache.cxf.tools.java2ws
cxftools-misc-<version>.jar	org.apache.cxf.tools.misc
cxftools-validator-<version>.jar	org.apache.cxf.tools.validator
cxftools-wadlto-jaxrs-<version>.jar	org.apache.cxf.tools.wadl
cxftools-wsdlto-core-<version>.jar	org.apache.cxf.tools.wsdl.core
cxftools-wsdlto-databinding-jaxb-<version>.jar	org.apache.cxf.tools.wsdl.jaxb
cxftools-wsdlto-frontend-javascript-<version>.jar	org.apache.cxf.tools.wsdl.js
cxftools-wsdlto-frontend-jaxws-<version>.jar	org.apache.cxf.tools.wsdl.jaxws
cxftools-wsdlto-test-<version>.jar	org.apache.cxf.tools.wsdl.test
cxfwadl2java-plugin-<version>.jar	org.apache.cxf.plugin.wadl2java
cxfwsdl-validator-plugin-<version>.jar	org.apache.cxf.wsdl.plugin.validator

Since we publish test artifacts as well, they have been enriched with **Automatic-Module-Name** manifest entry:

Test Module	Automatic-Module-Name
cxf-services-sts-systests-advanced- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.sts.advanced
cxf-services-sts-systests-basic- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.sts.basic
cxf-services-sts-systests-itests- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.sts.integration
cxf-services-sts-systests-osgi- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.sts.osgi
cxf-systests-cdi-base- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.cdi.base
cxf-systests-cdi-base- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.cdi.base.tests
cxf-systests-cdi-owb-multiple-apps- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.cdi.owb.multiapp
cxf-systests-cdi-owb-multiple-apps- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.cdi.owb.multiapp.tests
cxf-systests-cdi-owb-no-apps- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.cdi.owb.noapp
cxf-systests-cdi-owb-no-apps- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.cdi.owb.noapp.tests
cxf-systests-cdi-owb-producers- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.cdi.owb.producers
cxf-systests-cdi-owb-producers- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.cdi.owb.producers.tests
cxf-systests-cdi-weld-multiple-apps- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.cdi.weld.multiapp
cxf-systests-cdi-weld-multiple-apps- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.cdi.weld.multiapp.tests
cxf-systests-cdi-weld-no-apps- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.cdi.weld.noapp
cxf-systests-cdi-weld-no-apps- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.cdi.weld.noapp.tests
cxf-systests-cdi-weld-producers- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.cdi.weld.producers
cxf-systests-cdi-weld-producers- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.cdi.weld.producers.tests
cxf-systests-ci-grizzly- <b>&lt;version&gt;</b> .jar	<a href="#">org.apache.cxf.systests.ci.grizzly</a>
cxf-systests-codegen- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.plugin.codegen
cxf-systests-databinding- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.databinding
cxf-systests-databinding- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.databinding.tests
cxf-systests-http-sci- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.rs.sci
cxf-systests-java2ws- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.plugin.java2ws
cxf-systests-http-sci- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.rs.sci.tests
cxf-systests-jaxrs- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.jaxrs
cxf-systests-jaxrs- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.jaxrs.tests
cxf-systests-jaxws- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.jaxws
cxf-systests-jaxws- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.jaxws.tests
cxf-systests-kerberos- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.kerberos
cxf-systests-kerberos- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.kerberos.tests
cxf-systests-ldap- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.ldap
cxf-systests-ldap- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.ldap.tests
cxf-systests-microprofile-weld- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.microprofile.weld
cxf-systests-rs-security- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.security
cxf-systests-rs-security- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.security.tests
cxf-systests-rs-sse-base- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.rs.sse.base

cxf-systests-rs-sse-base- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.rs.sse.base.tests
cxf-systests-rs-sse-jetty- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.rs.sse.jetty
cxf-systests-rs-sse-jetty- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.rs.sse.jetty.tests
cxf-systests-rs-sse-tomcat- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.rs.sse.tomcat
cxf-systests-rs-sse-tomcat- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.rs.sse.tomcat.tests
cxf-systests-rs-sse-undertow- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.rs.sse.undertow
cxf-systests-rs-sse-undertow- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.rs.sse.undertow.tests
cxf-systests-tracing- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.tracing
cxf-systests-tracing- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.tracing.tests
cxf-systests-transport-jms- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.transport.jms
cxf-systests-transport-jms- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.transport.jms.tests
cxf-systests-transport- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.transport
cxf-systests-transport- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.transport.tests
cxf-systests-transport-ssl3- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.transport.ssl3
cxf-systests-transport-ssl3- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.transport.ssl3.tests
cxf-systests-transport-undertow- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.transport.undertow
cxf-systests-transport-undertow- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.transport.undertow.tests
cxf-systests-uncategorized- <b>&lt;version&gt;</b> .jar	org.apache.cxf.systests.uncategorized
cxf-systests-uncategorized- <b>&lt;version&gt;</b> -tests.jar	org.apache.cxf.systests.uncategorized.tests
cxf-systests-ws-rm- <b>&lt;version&gt;</b> .jar	<a href="http://org.apache.cxf.systests.ws.rm">org.apache.cxf.systests.ws.rm</a>
cxf-systests-ws-security- <b>&lt;version&gt;</b> .jar	<a href="http://org.apache.cxf.systests.ws.security">org.apache.cxf.systests.ws.security</a>
cxf-systests-ws-security- <b>&lt;version&gt;</b> -tests.jar	<a href="http://org.apache.cxf.systests.ws.security.tests">org.apache.cxf.systests.ws.security.tests</a>
cxf-systests-ws-security- <b>&lt;version&gt;</b> .jar	<a href="http://org.apache.cxf.systests.ws.security.examples">org.apache.cxf.systests.ws.security.examples</a>
cxf-systests-ws-security- <b>&lt;version&gt;</b> -tests.jar	<a href="http://org.apache.cxf.systests.ws.security.examples.tests">org.apache.cxf.systests.ws.security.examples.tests</a>
cxf-systests-ws-specs- <b>&lt;version&gt;</b> .jar	<a href="http://org.apache.cxf.systests.ws.specs">org.apache.cxf.systests.ws.specs</a>
cxf-systests-ws-specs- <b>&lt;version&gt;</b> -tests.jar	<a href="http://org.apache.cxf.systests.ws.specs.tests">org.apache.cxf.systests.ws.specs.tests</a>
cxf-systests-ws-transfer- <b>&lt;version&gt;</b> .jar	<a href="http://org.apache.cxf.systests.ws.transfer">org.apache.cxf.systests.ws.transfer</a>

## Example Usage

Here is a quick example of using Apache CXF SSE capabilities from modular Java application through the **module-info.java** descriptor.

```
module sample.sse {
    ...

    requires org.apache.cxf.frontend.jaxrs;
    requires org.apache.cxf.transport.http;
    requires org.apache.cxf.rs.sse;
    requires com.fasterxml.jackson.jaxrs.json;
    requires com.fasterxml.jackson.annotation;
    requires io.reactivex.rxjava2;

    requires transitive java.ws.rs;
    requires transitive org.reactivestreams;

    requires javax.servlet.api;
    requires jetty.server;
    requires jetty.servlet;
    requires jetty.util;

    requires java.xml.bind;
}
```