

# Internal Dependencies

## References

- [Analyze java package metrics in a graph database](#)
- [Calculate metrics](#)
- [Neo4j Python Driver](#)

## Artifacts

List the artifacts this notebook is based on. Different sorting variations help finding artifacts by their features and support larger code bases where the list of all artifacts gets too long.

Only the top 30 entries are shown. The whole table can be found in the following CSV report:

List\_all\_Java\_artifacts

Table 1a - Top 30 artifacts with the highest package count

|   | artifactName                              | packages | types | incomingDependencies | outgoingDependencies |
|---|---|----------|-------|----------------------|----------------------|
| 0 | axon-messaging-4.10.2.jar                 | 64       | 787   | 8                    | 0                    |
| 1 | axon-server-connector-4.10.2.jar          | 11       | 132   | 1                    | 4                    |
| 2 | axon-modelling-4.10.2.jar                 | 10       | 158   | 6                    | 1                    |
| 3 | axon-eventsourcing-4.10.2.jar             | 9        | 133   | 5                    | 2                    |
| 4 | axon-spring-boot-autoconfigure-4.10.2.jar | 9        | 75    | 0                    | 7                    |
| 5 | axon-test-4.10.2.jar                      | 8        | 87    | 1                    | 3                    |
| 6 | axon-configuration-4.10.2.jar             | 1        | 41    | 2                    | 4                    |
| 7 | axon-disruptor-4.10.2.jar                 | 1        | 22    | 1                    | 3                    |
| 8 | axon-tracing-opentelemetry-4.10.2.jar     | 1        | 5     | 1                    | 1                    |

Table 1b - Top 30 artifacts with the highest type count

|   | artifactName                              | packages | types | incomingDependencies | outgoingDependencies |
|---|---|----------|-------|----------------------|----------------------|
| 0 | axon-messaging-4.10.2.jar                 | 64       | 787   | 8                    | 0                    |
| 1 | axon-modelling-4.10.2.jar                 | 10       | 158   | 6                    | 1                    |
| 2 | axon-eventsourcing-4.10.2.jar             | 9        | 133   | 5                    | 2                    |
| 3 | axon-server-connector-4.10.2.jar          | 11       | 132   | 1                    | 4                    |
| 4 | axon-test-4.10.2.jar                      | 8        | 87    | 1                    | 3                    |
| 5 | axon-spring-boot-autoconfigure-4.10.2.jar | 9        | 75    | 0                    | 7                    |
| 6 | axon-configuration-4.10.2.jar             | 1        | 41    | 2                    | 4                    |
| 7 | axon-disruptor-4.10.2.jar                 | 1        | 22    | 1                    | 3                    |
| 8 | axon-tracing-opentelemetry-4.10.2.jar     | 1        | 5     | 1                    | 1                    |

Table 1c - Top 30 artifacts with the highest number of incoming dependencies

The following table lists the top 30 artifacts that are used the most by other artifacts (highest count of incoming dependencies, highest in-degree).

|   | artifactName                              | packages | types | incomingDependencies | outgoingDependencies |
|---|---|----------|-------|----------------------|----------------------|
| 0 | axon-messaging-4.10.2.jar                 | 64       | 787   | 8                    | 0                    |
| 1 | axon-modelling-4.10.2.jar                 | 10       | 158   | 6                    | 1                    |
| 2 | axon-eventsourcing-4.10.2.jar             | 9        | 133   | 5                    | 2                    |
| 3 | axon-configuration-4.10.2.jar             | 1        | 41    | 2                    | 4                    |
| 4 | axon-disruptor-4.10.2.jar                 | 1        | 22    | 1                    | 3                    |
| 5 | axon-server-connector-4.10.2.jar          | 11       | 132   | 1                    | 4                    |
| 6 | axon-test-4.10.2.jar                      | 8        | 87    | 1                    | 3                    |
| 7 | axon-tracing-opentelemetry-4.10.2.jar     | 1        | 5     | 1                    | 1                    |
| 8 | axon-spring-boot-autoconfigure-4.10.2.jar | 9        | 75    | 0                    | 7                    |

Table 1d - Top 30 artifacts with the highest number of outgoing dependencies

The following table lists the top 30 artifacts that are depending on the highest number of other artifacts (highest count of outgoing dependencies, highest out-degree).

|   | artifactName                              | packages | types | incomingDependencies | outgoingDependencies |
|---|---|----------|-------|----------------------|----------------------|
| 0 | axon-spring-boot-autoconfigure-4.10.2.jar | 9        | 75    | 0                    | 7                    |
| 1 | axon-configuration-4.10.2.jar             | 1        | 41    | 2                    | 4                    |
| 2 | axon-server-connector-4.10.2.jar          | 11       | 132   | 1                    | 4                    |
| 3 | axon-disruptor-4.10.2.jar                 | 1        | 22    | 1                    | 3                    |
| 4 | axon-test-4.10.2.jar                      | 8        | 87    | 1                    | 3                    |
| 5 | axon-eventsourcing-4.10.2.jar             | 9        | 133   | 5                    | 2                    |
| 6 | axon-modelling-4.10.2.jar                 | 10       | 158   | 6                    | 1                    |
| 7 | axon-tracing-opentelemetry-4.10.2.jar     | 1        | 5     | 1                    | 1                    |
| 8 | axon-messaging-4.10.2.jar                 | 64       | 787   | 8                    | 0                    |

Table 1e - Top 30 artifacts with the lowest package count

|   | artifactName                              | packages | types | incomingDependencies | outgoingDependencies |
|---|---|----------|-------|----------------------|----------------------|
| 0 | axon-configuration-4.10.2.jar             | 1        | 41    | 2                    | 4                    |
| 1 | axon-disruptor-4.10.2.jar                 | 1        | 22    | 1                    | 3                    |
| 2 | axon-tracing-opentelemetry-4.10.2.jar     | 1        | 5     | 1                    | 1                    |
| 3 | axon-test-4.10.2.jar                      | 8        | 87    | 1                    | 3                    |
| 4 | axon-eventsourcing-4.10.2.jar             | 9        | 133   | 5                    | 2                    |
| 5 | axon-spring-boot-autoconfigure-4.10.2.jar | 9        | 75    | 0                    | 7                    |
| 6 | axon-modelling-4.10.2.jar                 | 10       | 158   | 6                    | 1                    |
| 7 | axon-server-connector-4.10.2.jar          | 11       | 132   | 1                    | 4                    |
| 8 | axon-messaging-4.10.2.jar                 | 64       | 787   | 8                    | 0                    |

Table 1f - Top 30 artifacts with the lowest type count

|   | artifactName                              | packages | types | incomingDependencies | outgoingDependencies |
|---|---|----------|-------|----------------------|----------------------|
| 0 | axon-tracing-opentelemetry-4.10.2.jar     | 1        | 5     | 1                    | 1                    |
| 1 | axon-disruptor-4.10.2.jar                 | 1        | 22    | 1                    | 3                    |
| 2 | axon-configuration-4.10.2.jar             | 1        | 41    | 2                    | 4                    |
| 3 | axon-spring-boot-autoconfigure-4.10.2.jar | 9        | 75    | 0                    | 7                    |
| 4 | axon-test-4.10.2.jar                      | 8        | 87    | 1                    | 3                    |
| 5 | axon-server-connector-4.10.2.jar          | 11       | 132   | 1                    | 4                    |
| 6 | axon-eventsourcing-4.10.2.jar             | 9        | 133   | 5                    | 2                    |
| 7 | axon-modelling-4.10.2.jar                 | 10       | 158   | 6                    | 1                    |
| 8 | axon-messaging-4.10.2.jar                 | 64       | 787   | 8                    | 0                    |

Table 1g - Top 30 artifacts with the lowest number of incoming dependencies

The following table lists the top 30 artifacts that are used the least by other artifacts (lowest count of incoming dependencies, lowest in-degree).

|   | artifactName                              | packages | types | incomingDependencies | outgoingDependencies |
|---|---|----------|-------|----------------------|----------------------|
| 0 | axon-spring-boot-autoconfigure-4.10.2.jar | 9        | 75    | 0                    | 7                    |
| 1 | axon-disruptor-4.10.2.jar                 | 1        | 22    | 1                    | 3                    |
| 2 | axon-server-connector-4.10.2.jar          | 11       | 132   | 1                    | 4                    |
| 3 | axon-test-4.10.2.jar                      | 8        | 87    | 1                    | 3                    |
| 4 | axon-tracing-opentelemetry-4.10.2.jar     | 1        | 5     | 1                    | 1                    |
| 5 | axon-configuration-4.10.2.jar             | 1        | 41    | 2                    | 4                    |
| 6 | axon-eventsourcing-4.10.2.jar             | 9        | 133   | 5                    | 2                    |
| 7 | axon-modelling-4.10.2.jar                 | 10       | 158   | 6                    | 1                    |
| 8 | axon-messaging-4.10.2.jar                 | 64       | 787   | 8                    | 0                    |

Table 1h - Top 30 artifacts with the lowest number of outgoing dependencies

The following table lists the top 30 artifacts that are depending on the lowest number of other artifacts (lowest count of outgoing dependencies, lowest out-degree).

|   | artifactName                              | packages | types | incomingDependencies | outgoingDependencies |
|---|---|----------|-------|----------------------|----------------------|
| 0 | axon-messaging-4.10.2.jar                 | 64       | 787   | 8                    | 0                    |
| 1 | axon-modelling-4.10.2.jar                 | 10       | 158   | 6                    | 1                    |
| 2 | axon-tracing-opentelemetry-4.10.2.jar     | 1        | 5     | 1                    | 1                    |
| 3 | axon-eventsourcing-4.10.2.jar             | 9        | 133   | 5                    | 2                    |
| 4 | axon-disruptor-4.10.2.jar                 | 1        | 22    | 1                    | 3                    |
| 5 | axon-test-4.10.2.jar                      | 8        | 87    | 1                    | 3                    |
| 6 | axon-configuration-4.10.2.jar             | 1        | 41    | 2                    | 4                    |
| 7 | axon-server-connector-4.10.2.jar          | 11       | 132   | 1                    | 4                    |
| 8 | axon-spring-boot-autoconfigure-4.10.2.jar | 9        | 75    | 0                    | 7                    |

## Cyclic Dependencies

Cyclic dependencies occur when one package uses a class of another package and vice versa. These dependencies can lead to problems when one of these packages needs to be changed.

### Table 2a - Cyclic Dependencies Overview

Show the top 40 cyclic dependencies sorted by the most promising to resolve first. This is done by calculating the number of forward dependencies (first cycle participant to second cycle participant) in relation to backward dependencies (second cycle participant back to first cycle participant). The higher this rate (approaching 1), the easier it should be to resolve the cycle by focussing on the few backward dependencies.

Only the top 40 entries are shown. The whole table can be found in the following CSV report:

[Cyclic\\_Dependencies](#)

#### Columns:

- *artifactName* identifies the artifact of the first participant of the cycle
- *packageName* identifies the package of the first participant of the cycle
- *dependentArtifactName* identifies the artifact of the second participant of the cycle
- *dependentPackageName* identifies the package of the second participant of the cycle
- *forwardToBackwardBalance* is between 0 and 1. High for many forward and few backward dependencies.
- *numberForward* contains the number of dependencies from the first participant of the cycle to the second one
- *numberBackward* contains the number of dependencies from the second participant of the cycle back to the first one
- *someForwardDependencies* lists some forward dependencies in the text format "type1 -> type2"
- *backwardDependencies* lists the backward dependencies in the format "type1 <- type2" that are recommended to get resolved

|    | artifactName                 | packageName                                       | dependentArtifactName        | dependentPackageName                       | forward |
|----|------------------------------|---|------------------------------|--|---------|
| 0  | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.tracing                  |         |
| 1  | axon-messaging-4.10.2        | org.axonframework.queryhandling                   | axon-messaging-4.10.2        | org.axonframework.messaging.responsetypes  |         |
| 2  | axon-messaging-4.10.2        | org.axonframework.queryhandling                   | axon-messaging-4.10.2        | org.axonframework.tracing                  |         |
| 3  | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.messaging                |         |
| 4  | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.messaging.annotation     |         |
| 5  | axon-messaging-4.10.2        | org.axonframework.deadline                        | axon-messaging-4.10.2        | org.axonframework.tracing                  |         |
| 6  | axon-messaging-4.10.2        | org.axonframework.commandhandling                 | axon-messaging-4.10.2        | org.axonframework.tracing                  |         |
| 7  | axon-eventsourcing-4.10.2    | org.axonframework.eventsourcing                   | axon-eventsourcing-4.10.2    | org.axonframework.eventsourcing.eventstore |         |
| 8  | axon-messaging-4.10.2        | org.axonframework.commandhandling.callbacks       | axon-messaging-4.10.2        | org.axonframework.commandhandling          |         |
| 9  | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.util       | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector     |         |
| 10 | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.serialization            |         |
| 11 | axon-messaging-4.10.2        | org.axonframework.messaging.unitofwork            | axon-messaging-4.10.2        | org.axonframework.messaging                |         |
| 12 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.event.axon | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector     |         |
| 13 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query      | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector     |         |
| 14 | axon-messaging-4.10.2        | org.axonframework.eventhandling.async             | axon-messaging-4.10.2        | org.axonframework.eventhandling            |         |

|    | artifactName                 | packageName   | dependentArtifactName        | dependentPackageName                                       | forward |
|----|------------------------------|---|------------------------------|--|---------|
| 15 | axon-messaging-4.10.2        | org.axonframework.eventhandling.replay                      | axon-messaging-4.10.2        | org.axonframework.eventhandling                            |         |
| 16 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector                      | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.event.util          |         |
| 17 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query                | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query.subscription  |         |
| 18 | axon-messaging-4.10.2        | org.axonframework.serialization.upcasting.event             | axon-messaging-4.10.2        | org.axonframework.eventhandling                            |         |
| 19 | axon-eventsourcing-4.10.2    | org.axonframework.eventsourcing.eventstore.jdbc             | axon-eventsourcing-4.10.2    | org.axonframework.eventsourcing.eventstore.jdbc.statements |         |
| 20 | axon-messaging-4.10.2        | org.axonframework.eventhandling                             | axon-messaging-4.10.2        | org.axonframework.eventhandling.tokenstore                 |         |
| 21 | axon-modelling-4.10.2        | org.axonframework.modelling.command.inspection              | axon-modelling-4.10.2        | org.axonframework.modelling.command                        |         |
| 22 | axon-messaging-4.10.2        | org.axonframework.queryhandling.registration                | axon-messaging-4.10.2        | org.axonframework.queryhandling                            |         |
| 23 | axon-messaging-4.10.2        | org.axonframework.messaging                                 | axon-messaging-4.10.2        | org.axonframework.serialization                            |         |
| 24 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.command              | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector                     |         |
| 25 | axon-messaging-4.10.2        | org.axonframework.messaging.annotation                      | axon-messaging-4.10.2        | org.axonframework.messaging.interceptors                   |         |
| 26 | axon-modelling-4.10.2        | org.axonframework.modelling.saga                            | axon-modelling-4.10.2        | org.axonframework.modelling.saga.metamodel                 |         |
| 27 | axon-messaging-4.10.2        | org.axonframework.commandhandling.distributed.commandfilter | axon-messaging-4.10.2        | org.axonframework.commandhandling.distributed              |         |

## Table 2b - Cyclic Dependencies Break Down

Lists packages with cyclic dependencies with every dependency in a separate row sorted by the most promising dependency first.

Only the top 40 entries are shown. The whole table can be found in the following CSV report:

[Cyclic\\_Dependencies\\_Breakdown](#)

**Columns in addition to Table 2a:**

- *dependency* shows the cycle dependency in the text format "type1 -> type2" (forward) or "type2<-type1" (backward)

|    | artifactName          | packageName                     | dependentArtifactName | dependentPackageName                      | dependency  | forward |
|----|-----------------------|---------------------------------|-----------------------|---|---|---------|
| 0  | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | DefaultEventProcessorSpanFactory->Span                      |         |
| 1  | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | AbstractEventBus->Span                                      |         |
| 2  | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | SimpleEventBus\$Builder->SpanFactory                        |         |
| 3  | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | SubscribingEventProcessor\$Builder->SpanFactory             |         |
| 4  | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | EventMessage<-NestingSpanFactory                            |         |
| 5  | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | EventProcessorSpanFactory->Span                             |         |
| 6  | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | DefaultEventBusSpanFactory->SpanFactory                     |         |
| 7  | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | AbstractEventBus\$Builder->SpanFactory                      |         |
| 8  | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | AbstractEventBus->SpanScope                                 |         |
| 9  | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | AbstractEventProcessor\$Builder->SpanFactory                |         |
| 10 | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | DefaultEventBusSpanFactory\$Builder->SpanFactory            |         |
| 11 | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | EventBusSpanFactory->Span                                   |         |
| 12 | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | DefaultEventProcessorSpanFactory->SpanFactory               |         |
| 13 | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | AbstractEventProcessor->Span                                |         |
| 14 | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | DefaultEventProcessorSpanFactory->NoOpSpanFactory\$NoOpSpan |         |
| 15 | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | DefaultEventBusSpanFactory->Span                            |         |
| 16 | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | AbstractEventProcessor\$Builder->NoOpSpanFactory            |         |
| 17 | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | AbstractEventBus\$Builder->NoOpSpanFactory                  |         |
| 18 | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | DefaultEventProcessorSpanFactory\$Builder->SpanFactory      |         |
| 19 | axon-messaging-4.10.2 | org.axonframework.eventhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | TrackingEventProcessor\$Builder->SpanFactory                |         |
| 20 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | GenericStreamingQueryMessage->PublisherResponseType         |         |
| 21 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | SimpleQueryUpdateEmitter->ResponseType                      |         |
| 22 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | SimpleQueryUpdateEmitter->MultipleInstancesResponseType     |         |
| 23 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | GenericSubscriptionQueryMessage->ResponseType               |         |
| 24 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | SubscriptionQueryMessage->ResponseType                      |         |
| 25 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | GenericQueryMessage->ResponseType                           |         |



|    | artifactName          | packageName                     | dependentArtifactName | dependentPackageName                      | dependency                                      | forward |
|----|-----------------------|---------------------------------|-----------------------|---|---|---------|
| 26 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | QueryMessage->ResponseType                      |         |
| 27 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | SimpleQueryUpdateEmitter->PublisherResponseType |         |
| 28 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | SimpleQueryUpdateEmitter->OptionalResponseType  |         |
| 29 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | GenericStreamingQueryMessage->ResponseType      |         |
| 30 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | QueryGateway->ResponseTypes                     |         |
| 31 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | SimpleQueryBus->ResponseType                    |         |
| 32 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | DefaultQueryGateway->ResponseType               |         |
| 33 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | QueryResponseMessage<-ConvertingResponseMessage |         |
| 34 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | QuerySubscription->ResponseType                 |         |
| 35 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | StreamingQueryMessage->ResponseType             |         |
| 36 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.messaging.responsetypes | QueryGateway->ResponseType                      |         |
| 37 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | QueryMessage<-SpanUtils                         |         |
| 38 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | QueryUpdateEmitterSpanFactory->Span             |         |
| 39 | axon-messaging-4.10.2 | org.axonframework.queryhandling | axon-messaging-4.10.2 | org.axonframework.tracing                 | QueryBusSpanFactory->Span                       |         |

## Table 2c - Cyclic Dependencies Break Down - Backward Dependencies Only

Lists packages with cyclic dependencies with every dependency in a separate row sorted by the most promising dependency first. This table only contains the backward dependencies from the second participant of the cycle back to the first one that are the most promising to resolve.

Only the top 40 entries are shown. The whole table can be found in the following CSV report:

[Cyclic\\_Dependencies\\_Breakdown\\_BackwardOnly](#)

|    | artifactName                 | packageName                                       | dependentArtifactName        | dependentPackageName                       |                    |
|----|------------------------------|---|------------------------------|--|--------------------|
| 0  | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.tracing                  |                    |
| 1  | axon-messaging-4.10.2        | org.axonframework.queryhandling                   | axon-messaging-4.10.2        | org.axonframework.messaging.responsetypes  |                    |
| 2  | axon-messaging-4.10.2        | org.axonframework.queryhandling                   | axon-messaging-4.10.2        | org.axonframework.tracing                  |                    |
| 3  | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.messaging                |                    |
| 4  | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.messaging                |                    |
| 5  | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.messaging                |                    |
| 6  | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.messaging.annotation     | Sourcekel          |
| 7  | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.messaging.annotation     | AggregateTypeParar |
| 8  | axon-messaging-4.10.2        | org.axonframework.deadline                        | axon-messaging-4.10.2        | org.axonframework.tracing                  |                    |
| 9  | axon-messaging-4.10.2        | org.axonframework.commandhandling                 | axon-messaging-4.10.2        | org.axonframework.tracing                  |                    |
| 10 | axon-eventsourcing-4.10.2    | org.axonframework.eventsourcing                   | axon-eventsourcing-4.10.2    | org.axonframework.eventsourcing.eventstore |                    |
| 11 | axon-eventsourcing-4.10.2    | org.axonframework.eventsourcing                   | axon-eventsourcing-4.10.2    | org.axonframework.eventsourcing.eventstore |                    |
| 12 | axon-messaging-4.10.2        | org.axonframework.commandhandling.callbacks       | axon-messaging-4.10.2        | org.axonframework.commandhandling          |                    |
| 13 | axon-messaging-4.10.2        | org.axonframework.commandhandling.callbacks       | axon-messaging-4.10.2        | org.axonframework.commandhandling          |                    |
| 14 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.util       | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector     |                    |
| 15 | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.serialization            | G                  |
| 16 | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.serialization            |                    |
| 17 | axon-messaging-4.10.2        | org.axonframework.eventhandling                   | axon-messaging-4.10.2        | org.axonframework.serialization            | Gap/               |
| 18 | axon-messaging-4.10.2        | org.axonframework.messaging.unitofwork            | axon-messaging-4.10.2        | org.axonframework.messaging                |                    |
| 19 | axon-messaging-4.10.2        | org.axonframework.messaging.unitofwork            | axon-messaging-4.10.2        | org.axonframework.messaging                |                    |
| 20 | axon-messaging-4.10.2        | org.axonframework.messaging.unitofwork            | axon-messaging-4.10.2        | org.axonframework.messaging                |                    |
| 21 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.event.axon | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector     | EventProces        |
| 22 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.event.axon | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector     | AxonServe          |
| 23 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.event.axon | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector     | AxonServ           |
| 24 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.event.axon | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector     | Ax                 |
| 25 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.event.axon | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector     | AxonServerEventS   |

|    | artifactName                 | packageName                                  | dependentArtifactName        | dependentPackageName                                      |             |
|----|------------------------------|--|------------------------------|---|-------------|
| 26 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector                    |             |
| 27 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector                    |             |
| 28 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector                    | A           |
| 29 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector                    | Qu          |
| 30 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector                    | AxonServ    |
| 31 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector                    | AxonServerN |
| 32 | axon-messaging-4.10.2        | org.axonframework.eventhandling.async        | axon-messaging-4.10.2        | org.axonframework.eventhandling                           | Sequential  |
| 33 | axon-messaging-4.10.2        | org.axonframework.eventhandling.async        | axon-messaging-4.10.2        | org.axonframework.eventhandling                           |             |
| 34 | axon-messaging-4.10.2        | org.axonframework.eventhandling.async        | axon-messaging-4.10.2        | org.axonframework.eventhandling                           |             |
| 35 | axon-messaging-4.10.2        | org.axonframework.eventhandling.replay       | axon-messaging-4.10.2        | org.axonframework.eventhandling                           |             |
| 36 | axon-messaging-4.10.2        | org.axonframework.eventhandling.replay       | axon-messaging-4.10.2        | org.axonframework.eventhandling                           |             |
| 37 | axon-messaging-4.10.2        | org.axonframework.eventhandling.replay       | axon-messaging-4.10.2        | org.axonframework.eventhandling                           |             |
| 38 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector       | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.event.util         |             |
| 39 | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query | axon-server-connector-4.10.2 | org.axonframework.axonserver.connector.query.subscription | GrpcBe      |

## Interface Segregation Candidates

Well known from [Design Principles and Design Patterns by Robert C. Martin](#), the *Interface Segregation Principle* suggests that software components should have narrow, focused interfaces rather than large, general-purpose ones. The goal is to minimize the dependencies between components and increase modularity, flexibility, and maintainability.

Smaller, focused and purpose-driven interfaces

- make it easier to modify individual components without affecting the rest of the system.
- make it clearer which client is affected by which change.
- don't force their clients to depend on methods they don't need.
- reduce the scope of changes since a change to one component doesn't affect others.
- lead to a more loosely coupled architecture that is easier to understand and maintain.

Reference: [Analyze java package metrics in a graph database](#)

## How to apply the results

If just one method of a type is used, especially in many places, then the result of this method can be used to call e.g. a method or construct an object instead of using the whole object and then just calling that single method.

If there are a couple of methods that are used for a distinct purpose, those could be factored out into a separate interface. The original type can extend/implement the new interface so that there are no breaking changes. Then all the callers, that use only this group of methods, can be changed to the new interface.

## Table 4 - Top 40 most used combinations of methods

The following table shows the top 40 most used combinations of methods of larger types that might benefit from applying the *Interface Segregation Principle*. The whole table can be found in the CSV report `Candidates_for_Interface_Segregation`.

|    | fullDependentTypeName  | declaredMethods | calledMethodNames  | calledMethods | callerTypes |
|----|--|-----------------|--|---------------|-------------|
| 0  | org.axonframework.commandhandling.CommandMessage                     | 9               | [getCommandName]   | 1             | 20          |
| 1  | org.axonframework.eventhandling.EventMessage                         | 9               | [getIdentifier, getTimestamp]                                    | 2             | 10          |
| 2  | org.axonframework.eventhandling.DomainEventMessage                   | 10              | [getSequenceNumber]  | 1             | 9           |
| 3  | org.axonframework.eventhandling.EventMessage                         | 9               | [getIdentifier]  | 1             | 9           |
| 4  | org.axonframework.eventhandling.TrackedEventMessage                  | 10              | [trackingToken]  | 1             | 8           |
| 5  | org.axonframework.commandhandling.GenericCommandResultMessage        | 14              | [asCommandResultMessage]   | 1             | 6           |
| 6  | org.axonframework.eventhandling.DomainEventMessage                   | 10              | [getSequenceNumber, getAggregateIdentifier, getType]             | 3             | 6           |
| 7  | org.axonframework.messaging.ResultMessage                            | 9               | [isExceptional, exceptionResult]                                 | 2             | 6           |
| 8  | org.axonframework.eventhandling.ReplayToken                          | 13              | [createReplayToken]  | 1             | 5           |
| 9  | org.axonframework.deadline.GenericDeadlineMessage                    | 11              | [asDeadlineMessage]  | 1             | 5           |
| 10 | org.axonframework.eventhandling.DomainEventMessage                   | 10              | [getAggregateIdentifier]   | 1             | 5           |
| 11 | org.axonframework.eventhandling.TrackedEventMessage                  | 12              | [trackingToken]  | 1             | 4           |
| 12 | org.axonframework.deadline.DeadlineMessage                           | 10              | [getDeadlineName]  | 1             | 4           |
| 13 | org.axonframework.eventhandling.DomainEventMessage                   | 10              | [getType]  | 1             | 4           |
| 14 | org.axonframework.eventhandling.GenericEventMessage                  | 10              | [asEventMessage]   | 1             | 4           |
| 15 | org.axonframework.deadline.DefaultDeadlineManagerSpanFactory         | 8               | [builder]  | 1             | 4           |
| 16 | org.axonframework.common.transaction.NoTransactionManager            | 4               | [instance]   | 1             | 4           |
| 17 | org.axonframework.queryhandling.SimpleQueryUpdateEmitter             | 17              | [builder]  | 1             | 3           |
| 18 | org.axonframework.commandhandling.GenericCommandResultMessage        | 15              | [asCommandResultMessage]   | 1             | 3           |
| 19 | org.axonframework.eventhandling.ReplayToken                          | 13              | [isReplay]   | 1             | 3           |
| 20 | org.axonframework.modelling.command.inspection.AggregateModel        | 13              | [type]   | 1             | 3           |
| 21 | org.axonframework.queryhandling.SubscriptionQueryMessage             | 12              | [getUpdateResponseType]  | 1             | 3           |
| 22 | org.axonframework.eventhandling.DomainEventMessage                   | 11              | [getSequenceNumber, getAggregateIdentifier, getType]             | 3             | 3           |
| 23 | org.axonframework.eventhandling.GenericEventMessage                  | 11              | [asEventMessage]   | 1             | 3           |
| 24 | org.axonframework.queryhandling.SimpleQueryBus                       | 11              | [builder]  | 1             | 3           |
| 25 | org.axonframework.eventhandling.DomainEventMessage                   | 10              | [getSequenceNumber, getAggregateIdentifier]                      | 2             | 3           |
| 26 | org.axonframework.eventhandling.GapAwareTrackingToken                | 10              | [newInstance, withGapsTruncatedAt, getIndex, advanceTo, getGaps] | 5             | 3           |
| 27 | org.axonframework.queryhandling.DefaultQueryBusSpanFactory           | 10              | [builder]  | 1             | 3           |
| 28 | org.axonframework.commandhandling.gateway.DefaultCommandGateway      | 9               | [builder]  | 1             | 3           |
| 29 | org.axonframework.config.Configuration                               | 9               | [snapshotFilter, upcasterChain]                                  | 2             | 3           |
| 30 | org.axonframework.config.Configuration                               | 9               | [getComponent]   | 1             | 3           |
| 31 | org.axonframework.eventhandling.EventMessage                         | 9               | [getTimestamp]   | 1             | 3           |
| 32 | org.axonframework.messaging.MessageDecorator                         | 9               | [describeTo]   | 1             | 3           |
| 33 | org.axonframework.commandhandling.DefaultCommandBusSpanFactory       | 5               | [builder]  | 1             | 3           |
| 34 | org.axonframework.eventhandling.TrackedEventData                     | 5               | [trackingToken]  | 1             | 3           |
| 35 | org.axonframework.eventhandling.tokenstore.ConfigToken               | 5               | [get]  | 1             | 3           |
| 36 | org.axonframework.eventhandling.DefaultEventBusSpanFactory           | 4               | [builder]  | 1             | 3           |
| 37 | org.axonframework.queryhandling.DefaultQueryUpdateEmitterSpanFactory | 4               | [builder]  | 1             | 3           |
| 38 | org.axonframework.modelling.command.inspection.AnnotatedAggregate    | 17              | [initSequence, initialize, getAggregateRoot]                     | 4             | 2           |
| 39 | org.axonframework.queryhandling.DefaultQueryGateway                  | 17              | [builder]  | 1             | 2           |

## Package Usage

Table 5 - Types that are used by multiple packages

This table shows the top 40 packages that are used by the highest number of different packages. The whole table can be found in the CSV report

List\_types\_that\_are\_used\_by\_many\_different\_packages .

|   | fullQualifiedDependentTypeName                          | dependentTypeName          | dependentTypeLabels   | numberOfUsingF |
|---|---|----------------------------|---|----------------|
| 0 | org.axonframework.common.BuilderUtils                   | BuilderUtils               | [Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunit... |                |
| 1 | org.axonframework.common.AxonConfigurationException     | AxonConfigurationException | [Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunit... |                |
| 2 | org.axonframework.messaging.Message                     | Message                    | [Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityBetweenness, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent... |                |
| 3 | org.axonframework.messaging.MetaData                    | MetaData                   | [Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityBetweenness, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropaga... |                |
| 4 | org.axonframework.serialization.Serializer              | Serializer                 | [Type, File, Java, ByteCode, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityBetweenness, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPro... |                |
| 5 | org.axonframework.eventhandling.EventMessage            | EventMessage               | [Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, ... |                |
| 6 | org.axonframework.messaging.unitofwork.UnitOfWork       | UnitOfWork                 | [Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityArticleRank, Mark4TopCentralityBetweenness, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation... |                |
| 7 | org.axonframework.common.transaction.TransactionManager | TransactionManager         | [Type, File, Java, ByteCode, Interface, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity4, Mark4TypeLeidenCommu... |                |
| 8 | org.axonframework.common.Assert                         | Assert                     | [Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunit... |                |
| 9 | org.axonframework.serialization.SerializedObject        | SerializedObject           | [Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityBetweenness, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent... |                |

|    | fullQualifiedDependentTypeName                                  | dependentTypeName            | dependentTypeLabels   | numberOfUsingF |
|----|---|------------------------------|---|----------------|
| 10 | org.axonframework.serialization.SerializedType                  | SerializedType               | [Type, File, Java, ByteCode, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainComm... |                |
| 11 | org.axonframework.messaging.unitofwork.CurrentUnitOfWork        | CurrentUnitOfWork            | [Type, File, Java, ByteCode, Class, Mark4TopCentralityBetweenness, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity12, Mark4TypeKCoreDecomposition10]                          |                |
| 12 | org.axonframework.common.Registration                           | Registration                 | [Type, File, Java, ByteCode, Interface, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity1, Mark4TypeLeidenCommunity1, Mark4TypeKCoreDecomposit... |                |
| 13 | org.axonframework.tracing.SpanFactory                           | SpanFactory                  | [Type, File, Java, ByteCode, Interface, Mark4TopCentralityArticleRank, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity11, Mark4TypeLeidenCommunity2, Mark4TypeKCoreDecomposition10]                       |                |
| 14 | org.axonframework.lifecycle.Lifecycle                           | Lifecycle                    | [Type, File, Java, ByteCode, Interface, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity11, Mark4TypeLeidenCommunity6, Mark4TypeKCoreDecomposition10]  |                |
| 15 | org.axonframework.lifecycle.Lifecycle\$LifecycleRegistry        | Lifecycle\$LifecycleRegistry | [Type, File, Java, ByteCode, Interface, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity11, Mark4TypeLeidenCommunity6, Mark4TypeKCoreDecomposition10]  |                |
| 16 | org.axonframework.common.ObjectUtils                            | ObjectUtils                  | [Type, File, Java, ByteCode, Class, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity3, Mark4TypeLeidenCommunity7, Mark4TypeKCoreDecomposition10]   |                |
| 17 | org.axonframework.eventhandling.TrackingToken                   | TrackingToken                | [Type, File, Java, ByteCode, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation16, Mark4TypeLouvainCom... |                |
| 18 | org.axonframework.eventhandling.DomainEventMessage              | DomainEventMessage           | [Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity15, Mark4TypeLeidenCommunity14, ... |                |
| 19 | org.axonframework.messaging.annotation.ParameterResolverFactory | ParameterResolverFactory     | [Type, File, Java, ByteCode, Interface, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity14, Mark4TypeLeidenCommunity13, Mark4TypeKCoreDecomposition10]   |                |
| 20 | org.axonframework.common.AxonNonTransientException              | AxonNonTransientException    | [Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity14, Mark4TypeLeidenCommunity11, Mark4TypeKCoreDecomposi... |                |
| 21 | org.axonframework.eventhandling.GenericEventMessage             | GenericEventMessage          | [Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity2, Mark4TypeKCoreDecomposition10]                                       |                |

|    | fullQualifiedDependentTypeName                            | dependentTypeName          | dependentTypeLabels  | numberOfUsingF |
|----|---|----------------------------|--|----------------|
| 22 | org.axonframework.messaging.MessageDispatchInterceptor    | MessageDispatchInterceptor | [Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity1, Mark4TypeLeidenCommunity1, Mark4TypeKCoreDecomposition10]                                    |                |
| 23 | org.axonframework.messaging.MessageHandlerInterceptor     | MessageHandlerInterceptor  | [Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityBetweenness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity0, Mark4TypeKCoreDecomposition10]     |                |
| 24 | org.axonframework.serialization.SimpleSerializedObject    | SimpleSerializedObject     | [Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity7, Mark4TypeLeidenCommunity6, Mark4TypeKCoreDecomposition10]                                       |                |
| 25 | org.axonframework.tracing.NoOpSpanFactory                 | NoOpSpanFactory            | [Type, File, Java, ByteCode, Class, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity11, Mark4TypeLeidenCommunity2, Mark4TypeKCoreDecomposition10]   |                |
| 26 | org.axonframework.commandhandling.CommandMessage          | CommandMessage             | [Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, ...] |                |
| 27 | org.axonframework.eventhandling.EventBus                  | EventBus                   | [Type, File, Java, ByteCode, Interface, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity13, Mark4TypeLeidenCommunity12, Mark4TypeKCoreDecomposition10]  |                |
| 28 | org.axonframework.messaging.annotation.HandlerDefinition  | HandlerDefinition          | [Type, File, Java, ByteCode, Interface, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity14, Mark4TypeLeidenCommunity13, Mark4TypeKCoreDecomposition10, Mark4TypeMaximumKCut0.15615615615615616]             |                |
| 29 | org.axonframework.common.transaction.NoTransactionManager | NoTransactionManager       | [Type, File, Java, ByteCode, Enum, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecomposition10, Mark4TypeMaximumKCut0.14285714285714285]  |                |
| 30 | org.axonframework.messaging.ResultMessage                 | ResultMessage              | [Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityBetweenness, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity...  |                |
| 31 | org.axonframework.tracing.Span                            | Span                       | [Type, File, Java, ByteCode, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity11, Mark4TypeLeidenCommunity2, Mark4TypeKCoreDecompo...  |                |
| 32 | org.axonframework.messaging.unitofwork.DefaultUnitOfWork  | DefaultUnitOfWork          | [Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity2, Mark4TypeKCoreDecomposition10]  |                |
| 33 | org.axonframework.common.ReflectionUtils                  | ReflectionUtils            | [Type, File, Java, ByteCode, Class, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity14, Mark4TypeLeidenCommunity13, Mark4TypeKCoreDecomposition7]   |                |



|    | fullQualifiedDependentTypeName                            | dependentTypeName         | dependentTypeLabels   | numberOfUsingF |
|----|---|---------------------------|---|----------------|
| 34 | org.axonframework.eventhandling.TrackedEventMessage       | TrackedEventMessage       | [Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityArticleRank, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity4, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecomposition10]    |                |
| 35 | org.axonframework.common.AxonException                    | AxonException             | [Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation14, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity11, Mark4TypeKCoreDecomposi... |                |
| 36 | org.axonframework.common.DateTimeUtils                    | DateTimeUtils             | [Type, File, Java, ByteCode, Class, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity3, Mark4TypeLeidenCommunity7, Mark4TypeKCoreDecomposition8]  |                |
| 37 | org.axonframework.messaging.DefaultInterceptorChain       | DefaultInterceptorChain   | [Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity6, Mark4TypeKCoreDecomposition10]   |                |
| 38 | org.axonframework.eventhandling.GenericDomainEventMessage | GenericDomainEventMessage | [Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity2, Mark4TypeKCoreDecomposition10, Mark4TypeMaximumKCut0.2727272727272727]   |                |
| 39 | org.axonframework.messaging.InterceptorChain              | InterceptorChain          | [Type, File, Java, ByteCode, Interface, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity13, Mark4TypeKCoreDecomposition10]  |                |

Table 6 - Packages that are used by multiple artifacts

This table shows the top 30 artifacts that only use a few (compared to all existing) packages of another artifact. The whole table can be found in the CSV report [ArtifactPackageUsage](#) .

|    | artifactName                          | dependentArtifactName        | dependentPackages | dependentArtifactPackages | packageUsagePercentage | dependentFullQualifiedPacks  |
|----|---------------------------------------|------------------------------|-------------------|---------------------------|------------------------|--|
| 0  | axon-tracing-opentelemetry-4.10.2     | axon-messaging-4.10.2        | 3                 | 64                        | 0.046875               | [org.axonframework.messaging, org.axonframework.observability]   |
| 1  | axon-server-connector-4.10.2          | axon-modelling-4.10.2        | 1                 | 10                        | 0.100000               | [org.axonframework.modelling, org.axonframework.messaging]   |
| 2  | axon-spring-boot-autoconfigure-4.10.2 | axon-test-4.10.2             | 1                 | 8                         | 0.125000               | [org.axonframework.test]   |
| 3  | axon-disruptor-4.10.2                 | axon-messaging-4.10.2        | 9                 | 64                        | 0.140625               | [org.axonframework.commandhandling, org.axonframework.common, org.axonframework.common.tracing, org.axonframework.messaging.annotation, org.axonframework.messaging.command]   |
| 4  | axon-test-4.10.2                      | axon-messaging-4.10.2        | 10                | 64                        | 0.156250               | [org.axonframework.commandhandling, org.axonframework.common, org.axonframework.common.tracing, org.axonframework.messaging, org.axonframework.messaging.annotation, org.axonframework.messaging.command]  |
| 5  | axon-eventsourcing-4.10.2             | axon-modelling-4.10.2        | 2                 | 10                        | 0.200000               | [org.axonframework.modelling, org.axonframework.modelling.command]   |
| 6  | axon-disruptor-4.10.2                 | axon-modelling-4.10.2        | 2                 | 10                        | 0.200000               | [org.axonframework.modelling, org.axonframework.modelling.command]   |
| 7  | axon-test-4.10.2                      | axon-eventsourcing-4.10.2    | 2                 | 9                         | 0.222222               | [org.axonframework.eventhandling, org.axonframework.eventsourcing]   |
| 8  | axon-disruptor-4.10.2                 | axon-eventsourcing-4.10.2    | 2                 | 9                         | 0.222222               | [org.axonframework.eventhandling, org.axonframework.eventsourcing]   |
| 9  | axon-modelling-4.10.2                 | axon-messaging-4.10.2        | 18                | 64                        | 0.281250               | [org.axonframework.messaging, org.axonframework.common, org.axonframework.common.tracing, org.axonframework.messaging.annotation, org.axonframework.messaging.command, org.axonframework.messaging.eventhandling]  |
| 10 | axon-eventsourcing-4.10.2             | axon-messaging-4.10.2        | 20                | 64                        | 0.312500               | [org.axonframework.commandhandling, org.axonframework.common, org.axonframework.common.tracing, org.axonframework.messaging, org.axonframework.messaging.annotation, org.axonframework.messaging.command, org.axonframework.messaging.eventhandling]   |
| 11 | axon-server-connector-4.10.2          | axon-eventsourcing-4.10.2    | 3                 | 9                         | 0.333333               | [org.axonframework.eventsourcing, org.axonframework.eventhandling, org.axonframework.eventsourcing.snapshotting]   |
| 12 | axon-spring-boot-autoconfigure-4.10.2 | axon-server-connector-4.10.2 | 4                 | 11                        | 0.363636               | [org.axonframework.axonserver.connector, org.axonframework.axonserver.connector.eventhandling, org.axonframework.axonserver.connector.eventhandling.snapshotting]  |
| 13 | axon-server-connector-4.10.2          | axon-messaging-4.10.2        | 25                | 64                        | 0.390625               | [org.axonframework.common.tracing, org.axonframework.eventhandling, org.axonframework.eventhandling.snapshotting, org.axonframework.messaging, org.axonframework.messaging.annotation, org.axonframework.messaging.command, org.axonframework.messaging.eventhandling, org.axonframework.serialization, org.axonframework.serialization.upcasting] |
| 14 | axon-configuration-4.10.2             | axon-eventsourcing-4.10.2    | 4                 | 9                         | 0.444444               | [org.axonframework.eventsourcing, org.axonframework.eventsourcing.snapshotting, org.axonframework.eventhandling, org.axonframework.eventsourcing.eventhandling]  |
| 15 | axon-test-4.10.2                      | axon-modelling-4.10.2        | 5                 | 10                        | 0.500000               | [org.axonframework.modelling.command, org.axonframework.modelling, org.axonframework.modelling.saga.repository, org.axonframework.modelling.saga]  |

|    | artifactName                          | dependentArtifactName                 | dependentPackages | dependentArtifactPackages | packageUsagePercentage | dependentFullQualifiedPacka  |
|----|---------------------------------------|---------------------------------------|-------------------|---------------------------|------------------------|--|
| 16 | axon-configuration-4.10.2             | axon-messaging-4.10.2                 | 34                | 64                        | 0.531250               | [org.axonframework.queryorg.axonframework.eventhandling, org.axonframework.org.axonframework.common, org.axonframework.eventhandling.sorg.axonframework.serialization.upcasorg.axonframework.commandhandling.gateway, c            |
| 17 | axon-spring-boot-autoconfigure-4.10.2 | axon-eventsourcing-4.10.2             | 5                 | 9                         | 0.555556               | [org.axonframework.eventsourcing.εorg.axonframework.eventsourcing.eventstore, org.axonframework.eventorg.axonframework.eventsourcing.event   |
| 18 | axon-spring-boot-autoconfigure-4.10.2 | axon-modelling-4.10.2                 | 6                 | 10                        | 0.600000               | [org.axonframework.modelling.saga.org.axonframework.modelling.saga.repository, org.axonframework.modelling.org.axonframework.modelling.saga.reporg.axonframework.modelling.saga.repo:  |
| 19 | axon-modelling-4.10.2                 | axon-modelling-4.10.2                 | 6                 | 10                        | 0.600000               | [org.axonframework.modelling.org.axonframework.modelling.saga.reporg.axonframework.modelling.saga.reporg.axonframework.modelling.saga.rep:   |
| 20 | axon-configuration-4.10.2             | axon-modelling-4.10.2                 | 6                 | 10                        | 0.600000               | [org.axonframework.modelling.org.axonframework.modelling.command.iorg.axonframework.modelling.saga.repository, org.axonframework.modelling.saga.org.axonframework.modelling.saga.rep:  |
| 21 | axon-spring-boot-autoconfigure-4.10.2 | axon-messaging-4.10.2                 | 39                | 64                        | 0.609375               | [org.axonframework.common.org.axonframework.eventhandling.torg.axonframework.common, org.axonframework.eventorg.axonframework.eventhandling.deadletter, org.axonframework.seorg.axonframework.eventhandling.tokenstore.oi          |
| 22 | axon-test-4.10.2                      | axon-test-4.10.2                      | 5                 | 8                         | 0.625000               | [org.axonframework.test.matchers, org.axonframorg.axonframework.test.org.axonframework.test.eventorg.axonframework   |
| 23 | axon-messaging-4.10.2                 | axon-messaging-4.10.2                 | 41                | 64                        | 0.640625               | [org.axonframework.eventorg.axonframework.norg.axonframework.messaging.torg.axonframework.eventhandling.torg.axonframework.eventhandling.tokeorg.axonframework.serialization, org.axonframework.org.axonframework.common.legacyjpi |
| 24 | axon-eventsourcing-4.10.2             | axon-eventsourcing-4.10.2             | 7                 | 9                         | 0.777778               | [org.axonframework.eventorg.axonframework.eventsourcing.sncorg.axonframework.eventsourcing.εorg.axonframework.eventsourcing.eventstore.jdbc.sorg.axonframework.eventsourcing.conflictorg.axonframework.eventsourcing.eventorg.ε    |
| 25 | axon-server-connector-4.10.2          | axon-server-connector-4.10.2          | 9                 | 11                        | 0.818182               | [org.axonframework.axonserver.org.axonframework.axonserver.common, org.axonframework.axonserver.connectororg.axonframework.axonserver.conneorg.axonframework.axonserver.connector.eorg.axonframework.axonserver.connector./org.axo |
| 26 | axon-spring-boot-autoconfigure-4.10.2 | axon-spring-boot-autoconfigure-4.10.2 | 8                 | 9                         | 0.888889               | [org.axonframework.sprirorg.axonframework.springboot.util, org.axonframework.springboot.εorg.axonframework.springboot, org.axonframework.springboot.service.corg.axonframework.springboot.org.axonframework.a                      |
| 27 | axon-spring-boot-autoconfigure-4.10.2 | axon-configuration-4.10.2             | 1                 | 1                         | 1.000000               | [org.axonframew  |
| 28 | axon-server-connector-4.10.2          | axon-configuration-4.10.2             | 1                 | 1                         | 1.000000               | [org.axonframew  |

|    | artifactName                          | dependentArtifactName             | dependentPackages | dependentArtifactPackages | packageUsagePercentage | dependentFullQualifiedPacka     |
|----|---------------------------------------|-----------------------------------|-------------------|---------------------------|------------------------|---------------------------------|
| 29 | axon-spring-boot-autoconfigure-4.10.2 | axon-tracing-opentelemetry-4.10.2 | 1                 | 1                         | 1.000000               | [org.axonframework.tracing.oper |

## Table 7 - Types that are used by multiple artifacts

This table shows the top 30 types that only use a few (compared to all existing) types of another artifact. The whole table can be found in the CSV report `ClassesPerPackageUsageAcrossArtifacts`.

|    | artifactName                          | dependentArtifactName     | packageName  | dependentPackage.fqn                | dependentTypes | dependencies |
|----|---------------------------------------|---------------------------|--|-------------------------------------|----------------|--------------|
| 0  | axon-eventsourcing-4.10.2             | axon-messaging-4.10.2     | org.axonframework.eventsourcing.snapshotting               | org.axonframework.eventhandling     | 1              |              |
| 1  | axon-spring-boot-autoconfigure-4.10.2 | axon-messaging-4.10.2     | org.axonframework.springboot.util                          | org.axonframework.eventhandling     | 1              |              |
| 2  | axon-test-4.10.2                      | axon-messaging-4.10.2     | org.axonframework.test.matchers                            | org.axonframework.eventhandling     | 1              |              |
| 3  | axon-server-connector-4.10.2          | axon-messaging-4.10.2     | org.axonframework.axonserver.connector                     | org.axonframework.eventhandling     | 1              |              |
| 4  | axon-spring-boot-autoconfigure-4.10.2 | axon-messaging-4.10.2     | org.axonframework.springboot.autoconfig.legacyjpa          | org.axonframework.eventhandling     | 1              |              |
| 5  | axon-modelling-4.10.2                 | axon-messaging-4.10.2     | org.axonframework.modelling.saga.metamodel                 | org.axonframework.eventhandling     | 1              |              |
| 6  | axon-eventsourcing-4.10.2             | axon-modelling-4.10.2     | org.axonframework.eventsourcing.conflictresolution         | org.axonframework.modelling.command | 1              |              |
| 7  | axon-server-connector-4.10.2          | axon-modelling-4.10.2     | org.axonframework.axonserver.connector                     | org.axonframework.modelling.command | 1              |              |
| 8  | axon-eventsourcing-4.10.2             | axon-modelling-4.10.2     | org.axonframework.eventsourcing.eventstore.jdbc            | org.axonframework.modelling.command | 1              |              |
| 9  | axon-modelling-4.10.2                 | axon-messaging-4.10.2     | org.axonframework.modelling.command                        | org.axonframework.eventhandling     | 2              |              |
| 10 | axon-eventsourcing-4.10.2             | axon-messaging-4.10.2     | org.axonframework.eventsourcing.conflictresolution         | org.axonframework.eventhandling     | 2              |              |
| 11 | axon-modelling-4.10.2                 | axon-messaging-4.10.2     | org.axonframework.modelling.command.legacyjpa              | org.axonframework.eventhandling     | 2              |              |
| 12 | axon-test-4.10.2                      | axon-messaging-4.10.2     | org.axonframework.test.eventscheduler                      | org.axonframework.eventhandling     | 2              |              |
| 13 | axon-server-connector-4.10.2          | axon-eventsourcing-4.10.2 | org.axonframework.axonserver.connector.event.axon          | org.axonframework.eventsourcing     | 1              |              |
| 14 | axon-spring-boot-autoconfigure-4.10.2 | axon-configuration-4.10.2 | org.axonframework.springboot.autoconfig.legacyjpa          | org.axonframework.config            | 1              |              |
| 15 | axon-server-connector-4.10.2          | axon-configuration-4.10.2 | org.axonframework.axonserver.connector.processor           | org.axonframework.config            | 1              |              |
| 16 | axon-spring-boot-autoconfigure-4.10.2 | axon-configuration-4.10.2 | org.axonframework.springboot                               | org.axonframework.config            | 1              |              |
| 17 | axon-eventsourcing-4.10.2             | axon-messaging-4.10.2     | org.axonframework.eventsourcing.eventstore                 | org.axonframework.messaging         | 1              |              |
| 18 | axon-test-4.10.2                      | axon-messaging-4.10.2     | org.axonframework.test                                     | org.axonframework.messaging         | 1              |              |
| 19 | axon-eventsourcing-4.10.2             | axon-messaging-4.10.2     | org.axonframework.eventsourcing.conflictresolution         | org.axonframework.messaging         | 1              |              |
| 20 | axon-test-4.10.2                      | axon-messaging-4.10.2     | org.axonframework.test.matchers                            | org.axonframework.messaging         | 1              |              |
| 21 | axon-eventsourcing-4.10.2             | axon-messaging-4.10.2     | org.axonframework.eventsourcing.eventstore.jdbc            | org.axonframework.serialization     | 1              |              |
| 22 | axon-spring-boot-autoconfigure-4.10.2 | axon-messaging-4.10.2     | org.axonframework.springboot.autoconfig.legacyjpa          | org.axonframework.serialization     | 1              |              |
| 23 | axon-eventsourcing-4.10.2             | axon-messaging-4.10.2     | org.axonframework.eventsourcing.eventstore.jpa             | org.axonframework.serialization     | 1              |              |
| 24 | axon-eventsourcing-4.10.2             | axon-messaging-4.10.2     | org.axonframework.eventsourcing.eventstore.legacyjpa       | org.axonframework.serialization     | 1              |              |
| 25 | axon-eventsourcing-4.10.2             | axon-messaging-4.10.2     | org.axonframework.eventsourcing.eventstore.jdbc.statements | org.axonframework.eventhandling     | 3              |              |

|    | artifactName                 | dependentArtifactName     | packageName  | dependentPackage.fqn                       | dependentTypes | depend |
|----|------------------------------|---------------------------|--|--|----------------|--------|
| 26 | axon-test-4.10.2             | axon-modelling-4.10.2     | org.axonframework.test.utils                       | org.axonframework.modelling.saga           |                | 1      |
| 27 | axon-eventsourcing-4.10.2    | axon-messaging-4.10.2     | org.axonframework.eventsourcing.conflictresolution | org.axonframework.commandhandling          |                | 1      |
| 28 | axon-test-4.10.2             | axon-messaging-4.10.2     | org.axonframework.test.matchers                    | org.axonframework.commandhandling          |                | 1      |
| 29 | axon-server-connector-4.10.2 | axon-eventsourcing-4.10.2 | org.axonframework.axonserver.connector             | org.axonframework.eventsourcing.eventstore |                | 1      |

## Table 8 - Duplicate package names across artifacts

This table shows the top 30 duplicate package names across artifacts. They are ordered by the number of duplicates descending.

This might lead to confusion, makes importing more error prone and might even lead to duplicate classes where only one of them will be loaded by the class loader. If a package is named the same way in two or more artifacts this even allows another artifact to access package protected classes, methods or members which might not be intended.

The whole table can be found in the CSV report `DuplicatePackageNamesAcrossArtifacts`.

| packageName | duplicates | artifactNames |
|-------------|------------|---------------|
|-------------|------------|---------------|

## Table 9 - Annotated elements

This table shows 30 most used Java Annotations including some examples where they are used.

|    | annotationName  | languageElement | numberOfAnnotatedElements |  |
|----|---|-----------------|---------------------------|--|
| 0  | javax.annotation.Nonnull  | Parameter       | 1617                      | [org.axonframework.axons<br>org.axonframework<br>org.axonframework   |
| 1  | java.lang.Deprecated  | Method          | 132                       | [org.<br>FlowControlConfiguration.getInitialN<br>.connector.AxonServerConfiguration<br>org.axonframework             |
| 2  | org.springframework.context.annotation.Bean                               | Method          | 111                       | [org.axonframework.springboot.autoconf<br>org.axonframework.spring<br>org.axonframework.springboot.autoconfig.A      |
| 3  | org.springframework.boot.autoconfigure.condition.ConditionalOnMissingBean | Method          | 78                        | [org.axonframework.spring<br>org.axonframework.springboot.autoconfig.A<br>org.axonframework.springboot.autoconfi     |
| 4  | java.lang.FunctionalInterface   | Interface       | 65                        | [org.ax<br>org.axo<br>org.axon<br>org.axonframework.axonserver.coni  |
| 5  | javax.annotation.Nullable   | Parameter       | 61                        | [org.axonframework<br>org.axonframework<br>org.axonframework<br>org.axonframework                                    |
| 6  | javax.annotation.Nonnull  | Method          | 50                        | [org.axonframework.e<br>org.axonfram<br>org.axonframew   |
| 7  | java.lang.annotation.Retention  | Annotation      | 43                        | [org.axonframework.eventsourcing.Even<br>org.axonframework.commandhandling.Comma<br>org.axonframework.commandh       |
| 8  | java.lang.annotation.Target   | Annotation      | 43                        | [org.axonframework.eventsourcing.Even<br>org.axonframework.commandhandling.Comma<br>org.axonframework.commandh       |
| 9  | java.lang.Deprecated  | Class           | 43                        | [org.axc<br>org.ax<br>org.axonframe<br>org.axonframework.axons   |
| 10 | javax.persistence.Basic   | Field           | 39                        | [org.<br>org.axonframework<br>org.axonframewc<br>org.axonframework.eventi  |
| 11 | jakarta.persistence.Basic   | Field           | 33                        | [org.<br>org.axonframework<br>org.axonframewc<br>org.axonframework.eventi  |
| 12 | com.fasterxml.jackson.annotation.JsonProperty                             | Parameter       | 32                        | [org.axonframework.commandhandling.dist<br>org.axonframework.commandhandling<br>org.axonframework.commandhandling    |
| 13 | java.lang.annotation.Documented   | Annotation      | 23                        | [org.axonframework.eventsourcing.Even<br>org.axonframework.commandhandling.Cor<br>org.axonframework.eventhandling.Di |
| 14 | org.springframework.boot.autoconfigure.AutoConfiguration                  | Class           | 22                        | [org.axonfram<br>org.axonframewc<br>o<br>org.axonframework.springbc  |
| 15 | java.beans.ConstructorProperties  | Constructor     | 21                        | [org.axonframework.commandhandling.c<br>org.axonframework.commandhand<br>org.axonframework.commandhandlir            |
| 16 | org.springframework.beans.factory.annotation.Qualifier                    | Parameter       | 20                        | [org.axonframework.springboot.autoconfig.<br>org.axonframework.springboot.autoconfig.<br>org.axonframework.springb   |
| 17 | java.lang.Deprecated  | Constructor     | 20                        | [org.axonframework.axonserver.connecto<br>org.axonframework.axons<br>org.axonfra                                     |
| 18 | com.fasterxml.jackson.annotation.JsonCreator                              | Constructor     | 16                        | [org<br>org.axonf<br>,<br>org.;  |
| 19 | org.springframework.boot.autoconfigure.AutoConfigureAfter                 | Class           | 16                        | [org.axonfram<br>org.axonframewc<br>o<br>org.axonframework.springbc  |

|    | annotationName  | languageElement | numberOfAnnotatedElements |  |
|----|---|-----------------|---------------------------|--|
| 20 | org.springframework.boot.autoconfigure.condition.ConditionalOnProperty    | Method          | 15                        | [org.axonframework.spring<br>org.axonframework.springboot.autoconfigure.A<br>org.axonframework.springboot.autoconfigure.     |
| 21 | org.springframework.boot.autoconfigure.AutoConfigureBefore                | Class           | 14                        | [org.axonfram<br>org.axonframewc<br>org.axonframework.springbc<br>org  |
| 22 | org.springframework.boot.autoconfigure.condition.ConditionalOnClass       | Class           | 12                        | [org.axonfram<br>org.axonframew<br>org.ε<br>org.axonframework.spring   |
| 23 | javax.persistence.Column  | Field           | 12                        | [org.a)<br>o<br>org.axonframework  |
| 24 | org.axonframework.common.Priority   | Class           | 11                        | [org.ε<br>org.<br>org.axonframework.co<br>org.axonframework.eventhandling.Seq  |
| 25 | jakarta.persistence.Column  | Field           | 11                        | [org.a)<br>o<br>org.axonframework  |
| 26 | org.springframework.boot.context.properties.EnableConfigurationProperties | Class           | 11                        | [org.axonframewc<br>o<br>org.axonframew<br>org.axonframework.spr   |
| 27 | javax.persistence.Lob   | Field           | 10                        | o<br>org.axonframe<br>org.axonframework.eventhandling.deadlett   |
| 28 | javax.persistence.Id  | Field           | 10                        | [org.axonframework.eventsourc<br>org.axonframework.eventsour<br>org.axonframew   |
| 29 | org.springframework.boot.autoconfigure.condition.ConditionalOnBean        | Method          | 10                        | [org.axonframework.springboot.autoconfigure.legac<br>org.axonframework.springboot.autoc<br>org.axonframework.springboot.auto |

Table 10 - Distance distribution between dependent files

This table shows the file directory distance distribution between dependent files. Intuitively, the distance is given by the fewest number of change directory commands needed to navigate between a file and a dependency it uses. Those are aggregate to see how many dependent files are in the same directory, how many are just one change directory command apart, and so on.

| dependency.fileDistanceAsFewestChangeDirectoryCommands | numberOfDependencies | numberOfDependencyUsers | numberOfDependencyProviders |   |
|--|----------------------|-------------------------|-----------------------------|---|
| 0  | 0                    | 2601                    | 1026                        | 1160<br>[/<br>4.10.2.jar, /o<br>/<br>/org/ε |
| 1  | 1                    | 90                      | 82                          | 38<br>/<br>/org/axoni                       |
| 2  | 2                    | 2503                    | 760                         | 472<br>[/<br>/org/axonfr<br>/org/axonframew |
| 3  | 4                    | 2595                    | 449                         | 541<br>[                                    |