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	

	artifactName	packageName	dependentArtifactName	dependentPackageName	forward
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	
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	EventProcessorSpanFactory->Span	
2	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	AbstractEventBus$Builder->NoOpSpanFactory	
3	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	DefaultEventBusSpanFactory->SpanFactory	
4	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	EventMessage<-NestingSpanFactory	
5	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	EventBusSpanFactory->Span	
6	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	DefaultEventBusSpanFactory->Span	
7	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	TrackingEventProcessor$Builder->SpanFactory	
8	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	AbstractEventProcessor->Span	
9	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	AbstractEventBus->SpanScope	
10	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	DefaultEventBusSpanFactory$Builder->SpanFactory	
11	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	AbstractEventBus$Builder->SpanFactory	
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$Builder->SpanFactory	
14	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	DefaultEventProcessorSpanFactory->NoOpSpanFactory$NoOpSpan	
15	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	DefaultEventProcessorSpanFactory$Builder->SpanFactory	
16	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	AbstractEventBus->Span	
17	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	AbstractEventProcessor$Builder->NoOpSpanFactory	
18	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	SubscribingEventProcessor$Builder->SpanFactory	
19	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.tracing	SimpleEventBus$Builder->SpanFactory	
20	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	QueryGateway->ResponseTypes	
21	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	GenericStreamingQueryMessage->PublisherResponseType	
22	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	SubscriptionQueryMessage->ResponseType	
23	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	SimpleQueryBus->ResponseType	
24	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	GenericSubscriptionQueryMessage->ResponseType	
25	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	QuerySubscription->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	SimpleQueryUpdateEmitter->ResponseType	
27	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	GenericStreamingQueryMessage->ResponseType	
28	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	GenericQueryMessage->ResponseType	
29	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	QueryGateway->ResponseType	
30	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->OptionalResponseType	
31	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	DefaultQueryGateway->ResponseType	
32	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	QueryMessage->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	StreamingQueryMessage->ResponseType	
35	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->MultipleInstancesResponseType	
36	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->PublisherResponseType	
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	DefaultQueryBusSpanFactory$Builder->SpanFactory	
39	axon-messaging-4.10.2	org.axonframework.queryhandling	axon-messaging-4.10.2	org.axonframework.tracing	DefaultQueryBusSpanFactory->SpanFactory	

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	AggregateTypeParar
7	axon-messaging-4.10.2	org.axonframework.eventhandling	axon-messaging-4.10.2	org.axonframework.messaging.annotation	SourceId
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	GapA
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	SequentialF
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	GrpcBa

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 constuct 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 extended/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	[initialize, getAggregateRoot, initSequence]	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, Mark4TypeLouvainCommunity5, 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	numberOfUsingP
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, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecomposit...	
13	org.axonframework.tracing.SpanFactory	SpanFactory	[Type, File, Java, ByteCode, Interface, Mark4TopCentralityArticleRank, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecomposition10]	
14	org.axonframework.lifecycle.Lifecycle	Lifecycle	[Type, File, Java, ByteCode, Interface, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity0, Mark4TypeKCoreDecomposition10]	
15	org.axonframework.lifecycle.Lifecycle$LifecycleRegistry	Lifecycle$LifecycleRegistry	[Type, File, Java, ByteCode, Interface, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity0, 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, Mark4TypeLouvainCommunity16, Mark4TypeLeidenCommunity4, M...	
19	org.axonframework.messaging.annotation.ParameterResolverFactory	ParameterResolverFactory	[Type, File, Java, ByteCode, Interface, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity13, Mark4TypeLeidenCommunity13, Mark4TypeKCoreDecomposition10]	
20	org.axonframework.common.AxonNonTransientException	AxonNonTransientException	[Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity13, Mark4TypeLeidenCommunity11, Mark4TypeKCoreDecomposi...	
21	org.axonframework.eventhandling.GenericEventMessage	GenericEventMessage	[Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity6, 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, Mark4TypeLeidenCommunity1, 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, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity3, 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, Mark4TypeLouvainCommunity15, Mark4TypeLeidenCommunity13, Mark4TypeKCoreDecomposition10, Mark4TypeMaximumKCut0.15615615615615616]	
29	org.axonframework.common.transaction.NoTransactionManager	NoTransactionManager	[Type, File, Java, ByteCode, Enum, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity0, 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, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecompos...	
32	org.axonframework.messaging.unitofwork.DefaultUnitOfWork	DefaultUnitOfWork	[Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity12, Mark4TypeKCoreDecomposition10]	
33	org.axonframework.common.ReflectionUtils	ReflectionUtils	[Type, File, Java, ByteCode, Class, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity15, Mark4TypeLeidenCommunity13, Mark4TypeKCoreDecomposition7]	

	fullQualifiedDependentTypeName	dependentTypeName	dependentTypeLabels	numberOfUsingP
34	org.axonframework.eventhandling.TrackedEventMessage	TrackedEventMessage	[Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityArticleRank, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity5, Mark4TypeLeidenCommunity2, Mark4TypeKCoreDecomposition10]	
35	org.axonframework.common.AxonException	AxonException	[Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation14, Mark4TypeLouvainCommunity12, Mark4TypeLeidenCommunity11, Mark4TypeKCoreDecompos...	
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, Mark4TypeLeidenCommunity1, Mark4TypeKCoreDecomposition10]	
38	org.axonframework.eventhandling.GenericDomainEventMessage	GenericDomainEventMessage	[Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity6, Mark4TypeKCoreDecomposition10, Mark4TypeMaximumKCut0.2727272727272727]	
39	org.axonframework.messaging.InterceptorChain	InterceptorChain	[Type, File, Java, ByteCode, Interface, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation0, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity12, 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	dependentFullQualifiedPacka
0	axon-tracing-opentelemetry-4.10.2	axon-messaging-4.10.2	3	64	0.046875	[org.axonframework.messaging, org.axonframework org.axonframewo
1	axon-server-connector-4.10.2	axon-modelling-4.10.2	1	10	0.100000	[org.axonframework.modelling.
2	axon-spring-boot-autoconfigure-4.10.2	axon-test-4.10.2	1	8	0.125000	[org.axonframework.t
3	axon-disruptor-4.10.2	axon-messaging-4.10.2	9	64	0.140625	[org.axonframework.commandhandling org.axonframework.commo org.axonframework.messaging.u org.axonframework.common, org.axonframework.n org.axonframework.r org.axonframework.messaging.a org.axonframework.commandhandling, org.axonf
4	axon-test-4.10.2	axon-messaging-4.10.2	10	64	0.156250	[org.axonframework.messaging, org.axonframework org.axonframework.comman org.axonframework.messaging.u org.axonframework.comm org.axonframework.ever org.axonframework org.axonframework.messaging.a org.axonframework.comma
5	axon-eventsourcing-4.10.2	axon-modelling-4.10.2	2	10	0.200000	[org.axonframework.modelling. org.axonframework.modelling.command.i
6	axon-disruptor-4.10.2	axon-modelling-4.10.2	2	10	0.200000	[org.axonframework.modelling. org.axonframework.modelling.command.i
7	axon-test-4.10.2	axon-eventsourcing-4.10.2	2	9	0.222222	[org.axonframework.ever org.axonframework.eventsourcing.e
8	axon-disruptor-4.10.2	axon-eventsourcing-4.10.2	2	9	0.222222	[org.axonframework.ever org.axonframework.eventsourcing.e
9	axon-modelling-4.10.2	axon-messaging-4.10.2	18	64	0.281250	[org.axonframework.messaging.a org.axonframework.ever org.axonframework.common.a org.axonframework.common, org.axonframework.n org.axonframework org.axonframework.commor org.axonframework.con org.axonframework.common.lega
10	axon-eventsourcing-4.10.2	axon-messaging-4.10.2	20	64	0.312500	[org.axonframework.se org.axonframework.ever org.axonframework.common, org.axonframework.n org.axonframework.con org.axonframework.c org.axonframework.monitoring, org.axonframewo org.axonframework.commo org.axonframew
11	axon-server-connector-4.10.2	axon-eventsourcing-4.10.2	3	9	0.333333	[org.axonframework.eventsourcing.e org.axonframework.eventsourcing.sna org.axonframework.ever
12	axon-spring-boot-autoconfigure-4.10.2	axon-server-connector-4.10.2	4	11	0.363636	[org.axonframework.axonserver.connector.e org.axonframework.axonserver.conne org.axonframework.axonserver.connector. org.axonframework.axonserver.
13	axon-server-connector-4.10.2	axon-messaging-4.10.2	25	64	0.390625	[org.axonframework.eventhandling.t org.axonframework.ever org.axonframewor org.axonframework.common.tr org.axonframework.eventhandli org.axonframework.n org.axonframework.serialization, org.axonframework org.axonframework
14	axon-configuration-4.10.2	axon-eventsourcing-4.10.2	4	9	0.444444	[org.axonframework.eventsourcing.e org.axonframework.eventsourcing.ever org.axonframework.ever org.axonframework.eventsourcing.sna
15	axon-test-4.10.2	axon-modelling-4.10.2	5	10	0.500000	[org.axonframework.modelling.command.i org.axonframework.modelling. org.axonframework.modelling.saga. org.axonframework.mode org.axonframework.modelling.saga.repository.

	artifactName	dependentArtifactName	dependentPackages	dependentArtifactPackages	packageUsagePercentage	dependentFullQualifiedPacka
16	axon-configuration-4.10.2	axon-messaging-4.10.2	34	64	0.531250	[org.axonframework.tracing, org.axonframework org.axonframework.se org.axonframework.con org.axonframework.comman org.axonframework.eventhandling.tokenstore. org.axonframework.messaging. org.axonframework.eventhandling.tokensto
17	axon-spring-boot-autoconfigure-4.10.2	axon-eventsourcing-4.10.2	5	9	0.555556	[org.axonframework.eventsourcing.event org.axonframework.eventsourcing.ever org.axonframework.ever org.axonframework.eventsourcing.e org.axonframework.eventsourcing.eventstore.
18	axon-spring-boot-autoconfigure-4.10.2	axon-modelling-4.10.2	6	10	0.600000	[org.axonframework.modelling. org.axonframework.modelling.saga.repo org.axonframework.modelling.saga.rep org.axonframework.mode org.axonframework.modelling.saga. org.axonframework.modelling.saga.repository.
19	axon-modelling-4.10.2	axon-modelling-4.10.2	6	10	0.600000	[org.axonframework.mode org.axonframework.modelling.saga.m org.axonframework.modelling.command.i org.axonframework.modelling. org.axonframework.modelling.saga. org.axonframework.modelling.saga.rep
20	axon-configuration-4.10.2	axon-modelling-4.10.2	6	10	0.600000	[org.axonframework.mode org.axonframework.modelling.saga.rep org.axonframework.modelling. org.axonframework.modelling.saga. org.axonframework.modelling.command.i org.axonframework.modelling.saga.repository.
21	axon-spring-boot-autoconfigure-4.10.2	axon-messaging-4.10.2	39	64	0.609375	[org.axonframework.eventhandling.token org.axonframework.deadline.db org.axonframework.eventhandling org.axonframework.eventhandli org.axonframework.deadli org.axonframework.n org.axonframework.serializ org.axonframewo
22	axon-test-4.10.2	axon-test-4.10.2	5	8	0.625000	[org.axonframework.test.deadline, org.axonframe org.axonframework.test org.axonframework.test.event org.axonframewor
23	axon-messaging-4.10.2	axon-messaging-4.10.2	41	64	0.640625	[org.axonframework.messaging.u org.axonframework.messaging.a org.axonframework.common, org.axonframework.n org.axonframework.messaging.c org.axonframework.common.tr org.axonframework.commo org.axonframework.eventhandling, org.ax
24	axon-eventsourcing-4.10.2	axon-eventsourcing-4.10.2	7	9	0.777778	[org.axonframework.eventsourcing.sna org.axonframework.ever org.axonframework.eventsourcing.e org.axonframework.eventsourcing.eventstore.jdbc.s org.axonframework.eventsourcing.conflict org.axonframework.eventsourcing.ever org.a
25	axon-server-connector-4.10.2	axon-server-connector-4.10.2	9	11	0.818182	[org.axonframework.axonserver. org.axonframework.axonserver.con org.axonframework.axonserver.connector org.axonframework.axonserver.conne org.axonframework.axonserver.connector.e org.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.springbo org.axonframework.actuator.a org.axonframework.springboot.service.c org.axonframework.s org.axonframework.sprin org.axonframework.springboot.util. org.axonframework.springboot.a org.axonfra
27	axon-spring-boot-autoconfigure-4.10.2	axon-configuration-4.10.2	1	1	1.000000	[org.axonframew

	artifactName	dependentArtifactName	dependentPackages	dependentArtifactPackages	packageUsagePercentage	dependentFullQualifiedPacka
28	axon-server-connector-4.10.2	axon-configuration-4.10.2	1	1	1.000000	[org.axonframew
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	depend
0	axon-spring-boot-autoconfigure-4.10.2	axon-messaging-4.10.2	org.axonframework.springboot.util	org.axonframework.eventhandling	1	
1	axon-modelling-4.10.2	axon-messaging-4.10.2	org.axonframework.modelling.saga.metamodel	org.axonframework.eventhandling	1	
2	axon-eventsourcing-4.10.2	axon-messaging-4.10.2	org.axonframework.eventsourcing.snapshotting	org.axonframework.eventhandling	1	
3	axon-spring-boot-autoconfigure-4.10.2	axon-messaging-4.10.2	org.axonframework.springboot.autoconfig.legacyjpa	org.axonframework.eventhandling	1	
4	axon-test-4.10.2	axon-messaging-4.10.2	org.axonframework.test.matchers	org.axonframework.eventhandling	1	
5	axon-server-connector-4.10.2	axon-messaging-4.10.2	org.axonframework.axonserver.connector	org.axonframework.eventhandling	1	
6	axon-eventsourcing-4.10.2	axon-modelling-4.10.2	org.axonframework.eventsourcing.eventstore.jdbc	org.axonframework.modelling.command	1	
7	axon-eventsourcing-4.10.2	axon-modelling-4.10.2	org.axonframework.eventsourcing.conflictresolution	org.axonframework.modelling.command	1	
8	axon-server-connector-4.10.2	axon-modelling-4.10.2	org.axonframework.axonserver.connector	org.axonframework.modelling.command	1	
9	axon-test-4.10.2	axon-messaging-4.10.2	org.axonframework.test.eventscheduler	org.axonframework.eventhandling	2	
10	axon-modelling-4.10.2	axon-messaging-4.10.2	org.axonframework.modelling.command.legacyjpa	org.axonframework.eventhandling	2	
11	axon-modelling-4.10.2	axon-messaging-4.10.2	org.axonframework.modelling.command	org.axonframework.eventhandling	2	
12	axon-eventsourcing-4.10.2	axon-messaging-4.10.2	org.axonframework.eventsourcing.conflictresolution	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	org.axonframework.config	1	
15	axon-spring-boot-autoconfigure-4.10.2	axon-configuration-4.10.2	org.axonframework.springboot.autoconfig.legacyjpa	org.axonframework.config	1	
16	axon-server-connector-4.10.2	axon-configuration-4.10.2	org.axonframework.axonserver.connector.processor	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.matchers	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	org.axonframework.messaging	1	
21	axon-spring-boot-autoconfigure-4.10.2	axon-messaging-4.10.2	org.axonframework.springboot.autoconfig.legacyjpa	org.axonframework.serialization	1	
22	axon-eventsourcing-4.10.2	axon-messaging-4.10.2	org.axonframework.eventsourcing.eventstore.jdbc	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.axonse org.axonframew org.axonframworl
1	java.lang.Deprecated	Method	132	[org. $FlowControlConfiguration.getInitialN$ $.connector.AxonServerConfiguration$ org.axonframewc
2	org.springframework.context.annotation.Bean	Method	111	[org.axonframework.springboot.autocon org.axonframework.sprin org.axonframework.springboot.autoconfig.A
3	org.springframework.boot.autoconfigure.condition.ConditionalOnMissingBean	Method	78	[org.axonframework.sprin org.axonframework.springboot.autoconfig.A org.axonframework.springboot.autoconfi
4	java.lang.FunctionalInterface	Interface	65	[org.ax org.axo org.axon org.axonframework.axonserver.con
5	javax.annotation.Nullable	Parameter	61	[org.axonframworl org.axonframework org.axonframework org.axonframewo
6	javax.annotation.Nonnull	Method	50	[org.axonframework.a org.axonfram org.axonframew
7	java.lang.annotation.Retention	Annotation	43	[org.axonframework.eventsourcing.Even org.axonframework.commandhandling.Comma org.axonframework.commandf
8	java.lang.annotation.Target	Annotation	43	[org.axonframework.eventsourcing.Even org.axonframework.commandhandling.Comma org.axonframework.commandf
9	java.lang.Deprecated	Class	43	[org.axo org.ax org.axonframe org.axonframework.axons
10	javax.persistence.Basic	Field	39	[org. org.axonframewor org.axonframewc org.axonframework.eventh
11	jakarta.persistence.Basic	Field	33	[org. org.axonframewor org.axonframewc org.axonframework.eventh
12	com.fasterxml.jackson.annotation.JsonProperty	Parameter	32	[org.axonframework.commandhandling.dist org.axonframework.commandhandling org.axonframework.commandhandling
13	java.lang.annotation.Documented	Annotation	23	[org.axonframework.eventsourcing.Even org.axonframework.commandhandling.Cor org.axonframework.eventhandling.Di
14	org.springframework.boot.autoconfigure.AutoConfiguration	Class	22	[org.axonfram org.axonframewc o org.axonframework.springbc
15	java.beans.ConstructorProperties	Constructor	21	[org.axonframework.commandhandling.c org.axonframework.commandhand org.axonframework.commandhandlir
16	java.lang.Deprecated	Constructor	20	[org.axonframework.axonserver.connecto org.axonframework.axonse org.axonfra
17	org.springframework.beans.factory.annotation.Qualifier	Parameter	20	[org.axonframework.springboot.autoconfig. org.axonframework.springboot.autoconfig. org.axonframework.springb
18	com.fasterxml.jackson.annotation.JsonCreator	Constructor	16	[org org.axonf o org.a
19	org.springframework.boot.autoconfigure.AutoConfigureAfter	Class	16	[org.axonfram org.axonframewc o org.axonframework.springbc

	annotationName	languageElement	numberOfAnnotatedElements	
20	org.springframework.boot.autoconfigure.condition.ConditionalOnProperty	Method	15	[org.axonframework.sprin org.axonframework.springboot.autoconfig.A org.axonframework.springboot.autoconfig.
21	org.springframework.boot.autoconfigure.AutoConfigureBefore	Class	14	[org.axonfram org.axonframewc org.axonframework.springbc org
22	javax.persistence.Column	Field	12	[org.a> o org.axonframewor
23	org.springframework.boot.autoconfigure.condition.ConditionalOnClass	Class	12	[org.axonfram org.axonframewv org.a org.axonframework.sprin
24	org.axonframework.common.Priority	Class	11	[org.a org. org.axonframework.co org.axonframework.eventhandling.Sequ
25	jakarta.persistence.Column	Field	11	[org.a> o org.axonframewor
26	org.springframework.boot.context.properties.EnableConfigurationProperties	Class	11	[org.axonframewc o org.axonframew org.axonframework.spr
27	javax.persistence.Lob	Field	10	o org.axonframe org.axonframework.eventhandling.deadlett
28	javax.persistence.Id	Field	10	[org.axonframework.eventsourc org.axonframework.eventsour org.axonframewc
29	org.springframework.boot.autoconfigure.condition.ConditionalOnBean	Method	10	[org.axonframework.springboot.autoconfig.legacy org.axonframework.springboot.autoc 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	[/axon-sprir /org/axonfram /or /org/axonfram /org/axonframewe
1	1	90	82	38	[/org/axonfram /org/ax /org/axonf
2	2	2503	760	472	[/org/axonframe /org/axonfram /org/axonframewe use
3	4	2595	449	541	[/org/axonfra /o /org