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-4.10.1.jar	64	787	8	0
1	axon-server-connector-4.10.1.jar	11	132	1	4
2	axon-modelling-4.10.1.jar	10	158	6	1
3	axon-eventsourcing-4.10.1.jar	9	133	5	2
4	axon-spring-boot-autoconfigure-4.10.1.jar	9	75	0	7
5	axon-test-4.10.1.jar	8	87	1	3
6	axon-configuration-4.10.1.jar	1	41	2	4
7	axon-disruptor-4.10.1.jar	1	22	1	3
8	axon-tracing-opentelemetry-4.10.1.jar	1	5	1	1

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

	artifactName	packages	types	incomingDependencies	outgoingDependencies
0	axon-messaging-4.10.1.jar	64	787	8	0
1	axon-modelling-4.10.1.jar	10	158	6	1
2	axon-eventsourcing-4.10.1.jar	9	133	5	2
3	axon-server-connector-4.10.1.jar	11	132	1	4
4	axon-test-4.10.1.jar	8	87	1	3
5	axon-spring-boot-autoconfigure-4.10.1.jar	9	75	0	7
6	axon-configuration-4.10.1.jar	1	41	2	4
7	axon-disruptor-4.10.1.jar	1	22	1	3
8	axon-tracing-opentelemetry-4.10.1.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-4.10.1.jar	64	787	8	0
1	axon-modelling-4.10.1.jar	10	158	6	1
2	axon-eventsourcing-4.10.1.jar	9	133	5	2
3	axon-configuration-4.10.1.jar	1	41	2	4
4	axon-disruptor-4.10.1.jar	1	22	1	3
5	axon-server-connector-4.10.1.jar	11	132	1	4
6	axon-test-4.10.1.jar	8	87	1	3
7	axon-tracing-opentelemetry-4.10.1.jar	1	5	1	1
8	axon-spring-boot-autoconfigure-4.10.1.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-4.10.1.jar	9	75	0	7
1	axon-configuration-4.10.1.jar	1	41	2	4
2	axon-server-connector-4.10.1.jar	11	132	1	4
3	axon-disruptor-4.10.1.jar	1	22	1	3
4	axon-test-4.10.1.jar	8	87	1	3
5	axon-eventsourcing-4.10.1.jar	9	133	5	2
6	axon-modelling-4.10.1.jar	10	158	6	1
7	axon-tracing-opentelemetry-4.10.1.jar	1	5	1	1
8	axon-messaging-4.10.1.jar	64	787	8	0

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

	artifactName	packages	types	incomingDependencies	outgoingDependencies
0	axon-configuration-4.10.1.jar	1	41	2	4
1	axon-disruptor-4.10.1.jar	1	22	1	3
2	axon-tracing-opentelemetry-4.10.1.jar	1	5	1	1
3	axon-test-4.10.1.jar	8	87	1	3
4	axon-eventsourcing-4.10.1.jar	9	133	5	2
5	axon-spring-boot-autoconfigure-4.10.1.jar	9	75	0	7
6	axon-modelling-4.10.1.jar	10	158	6	1
7	axon-server-connector-4.10.1.jar	11	132	1	4
8	axon-messaging-4.10.1.jar	64	787	8	0

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

	artifactName	packages	types	incomingDependencies	outgoingDependencies
0	axon-tracing-opentelemetry-4.10.1.jar	1	5	1	1
1	axon-disruptor-4.10.1.jar	1	22	1	3
2	axon-configuration-4.10.1.jar	1	41	2	4
3	axon-spring-boot-autoconfigure-4.10.1.jar	9	75	0	7
4	axon-test-4.10.1.jar	8	87	1	3
5	axon-server-connector-4.10.1.jar	11	132	1	4
6	axon-eventsourcing-4.10.1.jar	9	133	5	2
7	axon-modelling-4.10.1.jar	10	158	6	1
8	axon-messaging-4.10.1.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-4.10.1.jar	9	75	0	7
1	axon-disruptor-4.10.1.jar	1	22	1	3
2	axon-server-connector-4.10.1.jar	11	132	1	4
3	axon-test-4.10.1.jar	8	87	1	3
4	axon-tracing-opentelemetry-4.10.1.jar	1	5	1	1
5	axon-configuration-4.10.1.jar	1	41	2	4
6	axon-eventsourcing-4.10.1.jar	9	133	5	2
7	axon-modelling-4.10.1.jar	10	158	6	1
8	axon-messaging-4.10.1.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-4.10.1.jar	64	787	8	0
1	axon-modelling-4.10.1.jar	10	158	6	1
2	axon-tracing-opentelemetry-4.10.1.jar	1	5	1	1
3	axon-eventsourcing-4.10.1.jar	9	133	5	2
4	axon-disruptor-4.10.1.jar	1	22	1	3
5	axon-test-4.10.1.jar	8	87	1	3
6	axon-configuration-4.10.1.jar	1	41	2	4
7	axon-server-connector-4.10.1.jar	11	132	1	4
8	axon-spring-boot-autoconfigure-4.10.1.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-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	
1	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	
2	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.tracing	
3	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.messaging	
4	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.messaging.annotation	
5	axon-messaging-4.10.1	org.axonframework.deadline	axon-messaging-4.10.1	org.axonframework.tracing	
6	axon-messaging-4.10.1	org.axonframework.commandhandling	axon-messaging-4.10.1	org.axonframework.tracing	
7	axon-eventsourcing-4.10.1	org.axonframework.eventsourcing	axon-eventsourcing-4.10.1	org.axonframework.eventsourcing.eventstore	
8	axon-messaging-4.10.1	org.axonframework.commandhandling.callbacks	axon-messaging-4.10.1	org.axonframework.commandhandling	

	artifactName	packageName	dependentArtifactName	dependentPackageName	forward
9	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.util	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	
10	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.serialization	
11	axon-messaging-4.10.1	org.axonframework.messaging.unitofwork	axon-messaging-4.10.1	org.axonframework.messaging	
12	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.event.axon	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	
13	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.query	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	
14	axon-messaging-4.10.1	org.axonframework.eventhandling.async	axon-messaging-4.10.1	org.axonframework.eventhandling	
15	axon-messaging-4.10.1	org.axonframework.eventhandling.replay	axon-messaging-4.10.1	org.axonframework.eventhandling	
16	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.event.util	
17	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.query	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.query.subscription	
18	axon-messaging-4.10.1	org.axonframework.serialization.upcasting.event	axon-messaging-4.10.1	org.axonframework.eventhandling	
19	axon-eventsourcing-4.10.1	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.10.1	org.axonframework.eventsourcing.eventstore.jdbc.statements	

	artifactName	packageName	dependentArtifactName	dependentPackageName	forward
20	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.eventhandling.tokenstore	
21	axon-modelling-4.10.1	org.axonframework.modelling.command.inspection	axon-modelling-4.10.1	org.axonframework.modelling.command	
22	axon-messaging-4.10.1	org.axonframework.queryhandling.registration	axon-messaging-4.10.1	org.axonframework.queryhandling	
23	axon-messaging-4.10.1	org.axonframework.messaging	axon-messaging-4.10.1	org.axonframework.serialization	
24	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.command	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	
25	axon-messaging-4.10.1	org.axonframework.messaging.annotation	axon-messaging-4.10.1	org.axonframework.messaging.interceptors	
26	axon-modelling-4.10.1	org.axonframework.modelling.saga	axon-modelling-4.10.1	org.axonframework.modelling.saga.metamodel	
27	axon-messaging-4.10.1	org.axonframework.commandhandling.distributed.commandfilter	axon-messaging-4.10.1	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-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	AbstractEventProcessor$Builder->SpanFactory	
1	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	DefaultEventProcessorSpanFactory$Builder->SpanFactory	
2	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	DefaultEventBusSpanFactory->Span	
3	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	DefaultEventBusSpanFactory$Builder->SpanFactory	
4	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	EventMessage<-NestingSpanFactory	
5	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	EventBusSpanFactory->Span	
6	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	TrackingEventProcessor$Builder->SpanFactory	
7	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	DefaultEventProcessorSpanFactory->SpanFactory	
8	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	AbstractEventBus$Builder->NoOpSpanFactory	
9	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	SubscribingEventProcessor$Builder->SpanFactory	
10	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	AbstractEventBus->Span	
11	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	DefaultEventBusSpanFactory->SpanFactory	
12	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	AbstractEventProcessor$Builder->NoOpSpanFactory	
13	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	DefaultEventProcessorSpanFactory->Span	
14	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	AbstractEventBus->SpanScope	
15	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	SimpleEventBus$Builder->SpanFactory	
16	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	AbstractEventProcessor->Span	
17	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	DefaultEventProcessorSpanFactory->NoOpSpanFactory$NoOpSpan	
18	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	EventProcessorSpanFactory->Span	
19	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	AbstractEventBus$Builder->SpanFactory	
20	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	QueryGateway->ResponseTypes	
21	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	SimpleQueryBus->ResponseType	
22	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	DefaultQueryGateway->ResponseType	
23	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	GenericStreamingQueryMessage->PublisherResponseType	
24	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	GenericQueryMessage->ResponseType	
25	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	GenericStreamingQueryMessage->ResponseType	

	artifactName	packageName	dependentArtifactName	dependentPackageName	dependency	forward
26	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->MultipleInstancesResponseType	
27	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	QuerySubscription->ResponseType	
28	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	QueryResponseMessage<-ConvertingResponseMessage	
29	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	QueryGateway->ResponseType	
30	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	StreamingQueryMessage->ResponseType	
31	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	SubscriptionQueryMessage->ResponseType	
32	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	GenericSubscriptionQueryMessage->ResponseType	
33	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	QueryMessage->ResponseType	
34	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->OptionalResponseType	
35	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->PublisherResponseType	
36	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->ResponseType	
37	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.tracing	DefaultQueryBusSpanFactory->Span	
38	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.tracing	DefaultQueryBusSpanFactory->SpanFactory	
39	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.tracing	DefaultQueryUpdateEmitterSpanFactory->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-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.tracing	
1	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.messaging.responsetypes	
2	axon-messaging-4.10.1	org.axonframework.queryhandling	axon-messaging-4.10.1	org.axonframework.tracing	
3	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.messaging	
4	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.messaging	
5	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.messaging	
6	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.messaging.annotation	SourceId
7	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.messaging.annotation	AggregateTypeParam
8	axon-messaging-4.10.1	org.axonframework.deadline	axon-messaging-4.10.1	org.axonframework.tracing	
9	axon-messaging-4.10.1	org.axonframework.commandhandling	axon-messaging-4.10.1	org.axonframework.tracing	
10	axon-eventsourcing-4.10.1	org.axonframework.eventsourcing	axon-eventsourcing-4.10.1	org.axonframework.eventsourcing.eventstore	
11	axon-eventsourcing-4.10.1	org.axonframework.eventsourcing	axon-eventsourcing-4.10.1	org.axonframework.eventsourcing.eventstore	
12	axon-messaging-4.10.1	org.axonframework.commandhandling.callbacks	axon-messaging-4.10.1	org.axonframework.commandhandling	
13	axon-messaging-4.10.1	org.axonframework.commandhandling.callbacks	axon-messaging-4.10.1	org.axonframework.commandhandling	
14	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.util	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	
15	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.serialization	G
16	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.serialization	
17	axon-messaging-4.10.1	org.axonframework.eventhandling	axon-messaging-4.10.1	org.axonframework.serialization	GapA
18	axon-messaging-4.10.1	org.axonframework.messaging.unitofwork	axon-messaging-4.10.1	org.axonframework.messaging	
19	axon-messaging-4.10.1	org.axonframework.messaging.unitofwork	axon-messaging-4.10.1	org.axonframework.messaging	
20	axon-messaging-4.10.1	org.axonframework.messaging.unitofwork	axon-messaging-4.10.1	org.axonframework.messaging	
21	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.event.axon	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	AxonServe
22	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.event.axon	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	AxonServ
23	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.event.axon	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	Ax
24	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.event.axon	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	AxonServerEventS
25	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.event.axon	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	EventProces

	artifactName	packageName	dependentArtifactName	dependentPackageName	
26	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.query	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	AxonServerN
27	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.query	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	
28	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.query	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	AxonServ
29	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.query	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	A
30	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.query	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	Qu
31	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.query	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	
32	axon-messaging-4.10.1	org.axonframework.eventhandling.async	axon-messaging-4.10.1	org.axonframework.eventhandling	
33	axon-messaging-4.10.1	org.axonframework.eventhandling.async	axon-messaging-4.10.1	org.axonframework.eventhandling	
34	axon-messaging-4.10.1	org.axonframework.eventhandling.async	axon-messaging-4.10.1	org.axonframework.eventhandling	SequentialF
35	axon-messaging-4.10.1	org.axonframework.eventhandling.replay	axon-messaging-4.10.1	org.axonframework.eventhandling	
36	axon-messaging-4.10.1	org.axonframework.eventhandling.replay	axon-messaging-4.10.1	org.axonframework.eventhandling	
37	axon-messaging-4.10.1	org.axonframework.eventhandling.replay	axon-messaging-4.10.1	org.axonframework.eventhandling	
38	axon-server-connector-4.10.1	org.axonframework.axonserver.connector	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.event.util	
39	axon-server-connector-4.10.1	org.axonframework.axonserver.connector.query	axon-server-connector-4.10.1	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	[getTimestamp, getIdentifier]	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	[withGapsTruncatedAt, getIndex, getGaps, newInstance, advanceTo]	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	[getComponent]	1	3
30	org.axonframework.config.Configuration	9	[upcasterChain, snapshotFilter]	2	3
31	org.axonframework.eventhandling.EventMessage	9	[getTimestamp]	1	3
32	org.axonframework.messaging.MessageDecorator	9	[describeTo]	1	3
33	org.axonframework.queryhandling.QueryMessage	9	[getResponseType, getQueryName]	2	3
34	org.axonframework.commandhandling.DefaultCommandBusSpanFactory	5	[builder]	1	3
35	org.axonframework.eventhandling.TrackedEventData	5	[trackingToken]	1	3
36	org.axonframework.eventhandling.tokenstore.ConfigToken	5	[get]	1	3
37	org.axonframework.eventhandling.DefaultEventBusSpanFactory	4	[builder]	1	3
38	org.axonframework.queryhandling.DefaultQueryUpdateEmitterSpanFactory	4	[builder]	1	3
39	org.axonframework.modelling.command.inspection.AnnotatedAggregate	17	[getAggregateRoot, initialize, initSequence]	4	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, Mark4TypeLabelPropagation14, Mark4TypeLouvainCommuni...	
1	org.axonframework.common.AxonConfigurationException	AxonConfigurationException	[Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation14, Mark4TypeLouvainCommuni...	
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, Mark4TypeLabelPropagation4, ...	
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, Mark4TypeLabelPropagation14, Mark4TypeLouvainCommunity11, Mark4TypeLeidenCom...	
8	org.axonframework.common.Assert	Assert	[Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation26, Mark4TypeLouvainCommuni...	
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, Mark4TypeLabelPropagation38, Mark4TypeLouvainCom...	
11	org.axonframework.messaging.unitofwork.CurrentUnitOfWork	CurrentUnitOfWork	[Type, File, Java, ByteCode, Class, Mark4TopCentralityBetweenness, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation24, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity1, Mark4TypeKCoreDecomposition10]	
12	org.axonframework.common.Registration	Registration	[Type, File, Java, ByteCode, Interface, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation8, Mark4TypeLouvainCommunity9, Mark4TypeLeidenCommunity5, Mark4TypeKCoreDecomposit...	
13	org.axonframework.tracing.SpanFactory	SpanFactory	[Type, File, Java, ByteCode, Interface, Mark4TopCentralityArticleRank, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation47, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity12, Mark4TypeKCoreDecomposition10]	
14	org.axonframework.lifecycle.Lifecycle	Lifecycle	[Type, File, Java, ByteCode, Interface, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation14, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecomposition10]	
15	org.axonframework.lifecycle.Lifecycle$LifecycleRegistry	Lifecycle$LifecycleRegistry	[Type, File, Java, ByteCode, Interface, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation14, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecomposition10]	
16	org.axonframework.common.ObjectUtils	ObjectUtils	[Type, File, Java, ByteCode, Class, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation12, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity2, Mark4TypeKCoreDecomposition10]	
17	org.axonframework.eventhandling.TrackingToken	TrackingToken	[Type, File, Java, ByteCode, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation27, Mark4TypeLouvainCom...	
18	org.axonframework.eventhandling.DomainEventMessage	DomainEventMessage	[Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation21, Mark4TypeLouvainCommunity10, Mark4TypeLeidenCommunity8, ...	
19	org.axonframework.messaging.annotation.ParameterResolverFactory	ParameterResolverFactory	[Type, File, Java, ByteCode, Interface, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation1, Mark4TypeLouvainCommunity1, Mark4TypeLeidenCommunity0, Mark4TypeKCoreDecomposition10]	
20	org.axonframework.common.AxonNonTransientException	AxonNonTransientException	[Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation18, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity1, Mark4TypeKCoreDecomposit...	
21	org.axonframework.eventhandling.GenericEventMessage	GenericEventMessage	[Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation2, Mark4TypeLouvainCommunity4, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecomposition10]	

	fullQualifiedDependentTypeName	dependentTypeName	dependentTypeLabels	numberOfUsingF
22	org.axonframework.messaging.MessageDispatchInterceptor	MessageDispatchInterceptor	[Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation16, Mark4TypeLouvainCommunity6, Mark4TypeLeidenCommunity5, Mark4TypeKCoreDecomposition10]	
23	org.axonframework.messaging.MessageHandlerInterceptor	MessageHandlerInterceptor	[Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityBetweenness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation4, Mark4TypeLouvainCommunity3, Mark4TypeLeidenCommunity7, Mark4TypeKCoreDecomposition10]	
24	org.axonframework.serialization.SimpleSerializedObject	SimpleSerializedObject	[Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation38, Mark4TypeLouvainCommunity4, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecomposition10]	
25	org.axonframework.tracing.NoOpSpanFactory	NoOpSpanFactory	[Type, File, Java, ByteCode, Class, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation47, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity12, Mark4TypeKCoreDecomposition10]	
26	org.axonframework.commandhandling.CommandMessage	CommandMessage	[Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation8, ...	
27	org.axonframework.eventhandling.EventBus	EventBus	[Type, File, Java, ByteCode, Interface, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation20, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity1, Mark4TypeKCoreDecomposition10]	
28	org.axonframework.messaging.annotation.HandlerDefinition	HandlerDefinition	[Type, File, Java, ByteCode, Interface, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation22, Mark4TypeLouvainCommunity1, Mark4TypeLeidenCommunity0, Mark4TypeKCoreDecomposition10, Mark4TypeMaximumKCut0.15615615615616]	
29	org.axonframework.common.transaction.NoTransactionManager	NoTransactionManager	[Type, File, Java, ByteCode, Enum, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation14, Mark4TypeLouvainCommunity3, Mark4TypeLeidenCommunity7, Mark4TypeKCoreDecomposition10, Mark4TypeMaximumKCut0.14285714285714285]	
30	org.axonframework.messaging.ResultMessage	ResultMessage	[Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityBetweenness, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation2, Mark4TypeLouvainCommunity...	
31	org.axonframework.tracing.Span	Span	[Type, File, Java, ByteCode, Interface, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation47, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity12, Mark4TypeKCoreDecomp...	
32	org.axonframework.messaging.unitofwork.DefaultUnitOfWork	DefaultUnitOfWork	[Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation2, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity0, Mark4TypeKCoreDecomposition10]	
33	org.axonframework.common.ReflectionUtils	ReflectionUtils	[Type, File, Java, ByteCode, Class, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation5, Mark4TypeLouvainCommunity1, Mark4TypeLeidenCommunity0, Mark4TypeKCoreDecomposition7]	

	fullQualifiedDependentTypeName	dependentTypeName	dependentTypeLabels	numberOfUsingP
34	org.axonframework.eventhandling.TrackedEventMessage	TrackedEventMessage	[Type, File, Java, ByteCode, GenericDeclaration, Interface, Mark4TopCentralityArticleRank, Mark4TopCentralityHyperlinkInducedTopicSearchAuthority, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation30, Mark4TypeLouvainCommunity11, Mark4TypeLeidenCommunity9, Mark4TypeKCoreDecomposition10]	
35	org.axonframework.common.AxonException	AxonException	[Type, File, Java, ByteCode, Class, Mark4TopCentralityPageRank, Mark4TopCentralityArticleRank, Mark4TopCentralityHarmonic, Mark4TopCentralityCloseness, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation7, Mark4TypeLouvainCommunity7, Mark4TypeLeidenCommunity6, Mark4TypeKCoreDecompositi...	
36	org.axonframework.common.DateTimeUtils	DateTimeUtils	[Type, File, Java, ByteCode, Class, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation12, Mark4TypeLouvainCommunity8, Mark4TypeLeidenCommunity2, Mark4TypeKCoreDecomposition8]	
37	org.axonframework.messaging.DefaultInterceptorChain	DefaultInterceptorChain	[Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation4, Mark4TypeLouvainCommunity0, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecomposition10]	
38	org.axonframework.eventhandling.GenericDomainEventMessage	GenericDomainEventMessage	[Type, File, Java, ByteCode, Class, GenericDeclaration, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation2, Mark4TypeLouvainCommunity4, Mark4TypeLeidenCommunity3, Mark4TypeKCoreDecomposition10, Mark4TypeMaximumKCut0.2727272727272727]	
39	org.axonframework.messaging.InterceptorChain	InterceptorChain	[Type, File, Java, ByteCode, Interface, Mark4TypeWeaklyConnectedComponent0, Mark4TypeLabelPropagation13, Mark4TypeLouvainCommunity2, Mark4TypeLeidenCommunity0, 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-4.10.1	axon-messaging-4.10.1	3	64	0.046875	[org.axonframework.common, org.axonframewo org.axonframework.n
1	axon-server-connector-4.10.1	axon-modelling-4.10.1	1	10	0.100000	[org.axonframework.modelling.
2	axon-spring-boot-autoconfigure-4.10.1	axon-test-4.10.1	1	8	0.125000	[org.axonframework.t
3	axon-disruptor-4.10.1	axon-messaging-4.10.1	9	64	0.140625	[org.axonframework.n org.axonframework.commo org.axonframework.messaging.a org.axonframework.r org.axonframework.messaging.u org.axonframework.comman org.axonframework.commandhandling org.axonframework.common, org.axonf
4	axon-test-4.10.1	axon-messaging-4.10.1	10	64	0.156250	[org.axonframework org.axonframework.messaging.a org.axonframework.comman org.axonframework.ever org.axonframework.messaging.u org.axonframework.messaging, org.axonframework org.axonframework.commandhandling org.axonframev
5	axon-eventsourcing-4.10.1	axon-modelling-4.10.1	2	10	0.200000	[org.axonframework.modelling. org.axonframework.modelling.command.i
6	axon-disruptor-4.10.1	axon-modelling-4.10.1	2	10	0.200000	[org.axonframework.modelling. org.axonframework.modelling.command.i
7	axon-test-4.10.1	axon-eventsourcing-4.10.1	2	9	0.222222	[org.axonframework.ever org.axonframework.eventsourcing.e
8	axon-disruptor-4.10.1	axon-eventsourcing-4.10.1	2	9	0.222222	[org.axonframework.eventsourcing.e org.axonframework.ever
9	axon-modelling-4.10.1	axon-messaging-4.10.1	18	64	0.281250	[org.axonframework.se org.axonframework.common. org.axonframework.seriali org.axonframework org.axonframework.comman org.axonframework.messaging.in org.axonframework.n org.axonframework.commo org.axonframew
10	axon-eventsourcing-4.10.1	axon-messaging-4.10.1	20	64	0.312500	[org.axonframework.serialization.upcas org.axonframework.com org.axonframework.serialization, org.axonframework org.axonframework.ever org.axonframework.common.tr org.axonframework.c org.axonframework.monitoring, org.axonframewor
11	axon-server-connector-4.10.1	axon-eventsourcing-4.10.1	3	9	0.333333	[org.axonframework.eventsourcing.sna org.axonframework.eventsourcing.e org.axonframework.ever
12	axon-spring-boot-autoconfigure-4.10.1	axon-server-connector-4.10.1	4	11	0.363636	[org.axonframework.axonserver.connector. org.axonframework.axonserver.conne org.axonframework.axonserver. org.axonframework.axonserver.connector.e
13	axon-server-connector-4.10.1	axon-messaging-4.10.1	25	64	0.390625	[org.axonframework.common, org.axonframework.n org.axonframework.se org.axonframework.seriali org.axonframework.commo org.axonframewor org.axonframework.eventhandling.sched org.axonframework.eventhandl org.axonframe
14	axon-configuration-4.10.1	axon-eventsourcing-4.10.1	4	9	0.444444	[org.axonframework.ever org.axonframework.eventsourcing.sna org.axonframework.eventsourcing.e org.axonframework.eventsourcing.ever
15	axon-test-4.10.1	axon-modelling-4.10.1	5	10	0.500000	[org.axonframework.modelling.saga. org.axonframework.mode org.axonframework.modelling.saga.repository. org.axonframework.modelling. org.axonframework.modelling.command.i

	artifactName	dependentArtifactName	dependentPackages	dependentArtifactPackages	packageUsagePercentage	dependentFullQualifiedPacka
16	axon-configuration-4.10.1	axon-messaging-4.10.1	34	64	0.531250	[org.axonframework.commandhandling org.axonframework.common.a org.axonframework.ever org.axonframework.commo org.axonframework.eventhandling.s org.axonframework.eventhandling.tokenstore. org.axonframework.monitoring, org.axonframe
17	axon-spring-boot-autoconfigure-4.10.1	axon-eventsourcing-4.10.1	5	9	0.555556	[org.axonframework.eventsourcing.even org.axonframework.eventsourcing.event org.axonframework.ever org.axonframework.eventsourcing.e org.axonframework.eventsourcing.eventstore.
18	axon-configuration-4.10.1	axon-modelling-4.10.1	6	10	0.600000	[org.axonframework.modelling.command.i org.axonframework.modelling.saga. org.axonframework.modelling. org.axonframework.modelling.saga.rep org.axonframework.modelling.saga.repository. org.axonframework.mode
19	axon-spring-boot-autoconfigure-4.10.1	axon-modelling-4.10.1	6	10	0.600000	[org.axonframework.mode org.axonframework.modelling.saga. org.axonframework.modelling. org.axonframework.modelling.saga.rep org.axonframework.modelling.saga.repos org.axonframework.modelling.saga.repository.
20	axon-modelling-4.10.1	axon-modelling-4.10.1	6	10	0.600000	[org.axonframework.modelling.saga. org.axonframework.modelling.saga.rep org.axonframework.mode org.axonframework.modelling.command.i org.axonframework.modelling.saga.m org.axonframework.modelling.
21	axon-spring-boot-autoconfigure-4.10.1	axon-messaging-4.10.1	39	64	0.609375	[org.axonframework.ever org.axonframework.deadli org.axonframework.seriali org.axonframework.deadline.db org.axonframework.eventhandling.s org.axonframework.common.tr org.axonframework.con org.axonframework.eventhand
22	axon-test-4.10.1	axon-test-4.10.1	5	8	0.625000	[org.axonframework.test org.axonframework.test.event org.axonframework.tes org.axonframework.test.utils, org.axonframe
23	axon-messaging-4.10.1	axon-messaging-4.10.1	41	64	0.640625	[org.axonframework.comman org.axonframework.common, org.axonframework.c org.axonframework.ever org.axonframework.quer org.axonframework.common.a org.axonframework.messaging.a org.axonframework.n org.axonframework.messag
24	axon-eventsourcing-4.10.1	axon-eventsourcing-4.10.1	7	9	0.777778	[org.axonframework.eventsourcing.e org.axonframework.eventsourcing.sna org.axonframework.eventsourcing.eventstore.jdbc.s org.axonframework.ever org.axonframework.eventsourcing.conflict org.axonframework.eventsourcing.event org.
25	axon-server-connector-4.10.1	axon-server-connector-4.10.1	9	11	0.818182	[org.axonframework.axonserver. org.axonframework.axonserver.connector. org.axonframework.axonserver.connector org.axonframework.axonserver.con org.axonframework.axonserver.connector. org.axonframework.axonserver.conne org.ax
26	axon-spring-boot-autoconfigure-4.10.1	axon-spring-boot-autoconfigure-4.10.1	8	9	0.888889	[org.axonframework.springboot.service.c org.axonframework.sprir org.axonframework.s org.axonframework.springb org.axonframework.actuator.a org.axonframework.springboot.util. org.axonframework.springboot.a org.axonfra
27	axon-server-connector-4.10.1	axon-configuration-4.10.1	1	1	1.000000	[org.axonframew

	artifactName	dependentArtifactName	dependentPackages	dependentArtifactPackages	packageUsagePercentage	dependentFullQualifiedPacka
28	axon-spring-boot-autoconfigure-4.10.1	axon-tracing-opentelemetry-4.10.1	1	1	1.000000	[org.axonframework.tracing.oper
29	axon-configuration-4.10.1	axon-disruptor-4.10.1	1	1	1.000000	[org.axonframework.disruptor.comman

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-4.10.1	axon-messaging-4.10.1	org.axonframework.springboot.autoconfig.legacyjpa	org.axonframework.eventhandling	1	
1	axon-spring-boot-autoconfigure-4.10.1	axon-messaging-4.10.1	org.axonframework.springboot.util	org.axonframework.eventhandling	1	
2	axon-modelling-4.10.1	axon-messaging-4.10.1	org.axonframework.modelling.saga.metamodel	org.axonframework.eventhandling	1	
3	axon-eventsourcing-4.10.1	axon-messaging-4.10.1	org.axonframework.eventsourcing.snapshotting	org.axonframework.eventhandling	1	
4	axon-server-connector-4.10.1	axon-messaging-4.10.1	org.axonframework.axonserver.connector	org.axonframework.eventhandling	1	
5	axon-test-4.10.1	axon-messaging-4.10.1	org.axonframework.test.matchers	org.axonframework.eventhandling	1	
6	axon-eventsourcing-4.10.1	axon-modelling-4.10.1	org.axonframework.eventsourcing.conflictresolution	org.axonframework.modelling.command	1	
7	axon-eventsourcing-4.10.1	axon-modelling-4.10.1	org.axonframework.eventsourcing.eventstore.jdbc	org.axonframework.modelling.command	1	
8	axon-server-connector-4.10.1	axon-modelling-4.10.1	org.axonframework.axonserver.connector	org.axonframework.modelling.command	1	
9	axon-modelling-4.10.1	axon-messaging-4.10.1	org.axonframework.modelling.command	org.axonframework.eventhandling	2	
10	axon-test-4.10.1	axon-messaging-4.10.1	org.axonframework.test.eventscheduler	org.axonframework.eventhandling	2	
11	axon-eventsourcing-4.10.1	axon-messaging-4.10.1	org.axonframework.eventsourcing.conflictresolution	org.axonframework.eventhandling	2	
12	axon-modelling-4.10.1	axon-messaging-4.10.1	org.axonframework.modelling.command.legacyjpa	org.axonframework.eventhandling	2	
13	axon-server-connector-4.10.1	axon-eventsourcing-4.10.1	org.axonframework.axonserver.connector.event.axon	org.axonframework.eventsourcing	1	
14	axon-spring-boot-autoconfigure-4.10.1	axon-configuration-4.10.1	org.axonframework.springboot.autoconfig.legacyjpa	org.axonframework.config	1	
15	axon-server-connector-4.10.1	axon-configuration-4.10.1	org.axonframework.axonserver.connector.processor	org.axonframework.config	1	
16	axon-spring-boot-autoconfigure-4.10.1	axon-configuration-4.10.1	org.axonframework.springboot	org.axonframework.config	1	
17	axon-test-4.10.1	axon-messaging-4.10.1	org.axonframework.test	org.axonframework.messaging	1	
18	axon-eventsourcing-4.10.1	axon-messaging-4.10.1	org.axonframework.eventsourcing.conflictresolution	org.axonframework.messaging	1	
19	axon-test-4.10.1	axon-messaging-4.10.1	org.axonframework.test.matchers	org.axonframework.messaging	1	
20	axon-eventsourcing-4.10.1	axon-messaging-4.10.1	org.axonframework.eventsourcing.eventstore	org.axonframework.messaging	1	
21	axon-spring-boot-autoconfigure-4.10.1	axon-messaging-4.10.1	org.axonframework.springboot.autoconfig.legacyjpa	org.axonframework.serialization	1	
22	axon-eventsourcing-4.10.1	axon-messaging-4.10.1	org.axonframework.eventsourcing.eventstore.jdbc	org.axonframework.serialization	1	
23	axon-eventsourcing-4.10.1	axon-messaging-4.10.1	org.axonframework.eventsourcing.eventstore.legacyjpa	org.axonframework.serialization	1	
24	axon-eventsourcing-4.10.1	axon-messaging-4.10.1	org.axonframework.eventsourcing.eventstore.jpa	org.axonframework.serialization	1	
25	axon-eventsourcing-4.10.1	axon-messaging-4.10.1	org.axonframework.eventsourcing.eventstore.jdbc.statements	org.axonframework.eventhandling	3	

	artifactName	dependentArtifactName	packageName	dependentPackage.fqn	dependentTypes	depend
26	axon-test-4.10.1	axon-modelling-4.10.1	org.axonframework.test.utils	org.axonframework.modelling.saga	1	
27	axon-eventsourcing-4.10.1	axon-messaging-4.10.1	org.axonframework.eventsourcing.conflictresolution	org.axonframework.commandhandling	1	
28	axon-test-4.10.1	axon-messaging-4.10.1	org.axonframework.test.matchers	org.axonframework.commandhandling	1	
29	axon-server-connector-4.10.1	axon-eventsourcing-4.10.1	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	1616	[org.axonframework org.axonframework.test.aggregate.AggregateT
1	java.lang.Deprecated	Method	132	[org.axonframework.test.aggregate.Re org.axonframework.test.aggregate.Reporter.rep
2	org.springframework.context.annotation.Bean	Method	111	org.axonframework.spri
3	org.springframework.boot.autoconfigure.condition.ConditionalOnMissingBean	Method	78	org.axonframework.springboot.autoconfig.Inf
4	java.lang.FunctionalInterface	Interface	65	[org.axonframework.test.matchers.FieldI org.axonframework.axonserver.connecto
5	javax.annotation.Nullable	Parameter	61	[org.axonframework.eventsourcing.eventstore (0), org.axonframework.commandhandling
6	javax.annotation.Nonnull	Method	50	[org.axonframework.test.aggregate.AggregateTe
7	java.lang.Deprecated	Class	43	[org.a
8	java.lang.annotation.Retention	Annotation	43	[org.axonframework.command
9	java.lang.annotation.Target	Annotation	43	[org.axonframework.command
10	javax.persistence.Basic	Field	39	[org.axonframework.eventhandlin org.axonframework.eventhand
11	jakarta.persistence.Basic	Field	33	[org.axonframework.eventhandlin org.axonframework.eventhand
12	com.fasterxml.jackson.annotation.JsonProperty	Parameter	32	
13	java.lang.annotation.Documented	Annotation	23	[org.axonframework.eventsourcing.EventSourcin org.axonframework.eventhandling.Disallo
14	org.springframework.boot.autoconfigure.AutoConfiguration	Class	22	[org.axonframework.sp org.axonframework.springboc
15	java.beans.ConstructorProperties	Constructor	21	org.axonframew
16	org.springframework.beans.factory.annotation.Qualifier	Parameter	20	
17	java.lang.Deprecated	Constructor	20	org.axonframework.axonserver.connector.proces
18	com.fasterxml.jackson.annotation.JsonCreator	Constructor	16	[org.axonframework.eve org
19	org.springframework.boot.autoconfigure.AutoConfigureAfter	Class	16	[org.axonframework.sp org.axonframework.springboc
20	org.springframework.boot.autoconfigure.condition.ConditionalOnProperty	Method	15	org.axonframewo
21	org.springframework.boot.autoconfigure.AutoConfigureBefore	Class	14	[org.axonframework.springboot.autoconfig org.axonframework.springboot.autoconfig.l
22	org.springframework.boot.autoconfigure.condition.ConditionalOnClass	Class	12	org.axonfr org.axonfran
23	javax.persistence.Column	Field	12	[org.axonframew org.axonframework.eventhandl
24	jakarta.persistence.Column	Field	11	[org.axonframew org.axonframework.eventhandl
25	org.axonframework.common.Priority	Class	11	[org.axonframework.test.FixtureResour org.axonframework.eventhandling.Se
26	org.springframework.boot.context.properties.EnableConfigurationProperties	Class	11	[org.axonframework.springboc org.axonframework.springboot.a

	annotationName	languageElement	numberOfAnnotatedElements	
27	org.springframework.boot.autoconfigure.condition.ConditionalOnBean	Method	10	org.axonfra
28	javax.persistence.Id	Field	10	org.axonfran
29	javax.persistence.Lob	Field	10	[org.axonfran org.axonframework.eventhandling.deadlet

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	2600	1026	1160	[/axon-s
1	1	90	82	38	/org/a
2	2	2503	760	472	
3	4	2595	449	541	/org/axonframew