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_existing_artifacts`

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

	artifactName	packages	types	incomingDependencies	outgoingDependencies
0	axon-messaging-4.8.2.jar	64	762	5	0
1	axon-modelling-4.8.2.jar	10	150	4	1
2	axon-eventsourcing-4.8.2.jar	9	130	3	2
3	axon-test-4.8.2.jar	8	87	0	3
4	axon-configuration-4.8.2.jar	1	39	0	4
5	axon-disruptor-4.8.2.jar	1	22	1	3

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

	artifactName	packages	types	incomingDependencies	outgoingDependencies
0	axon-messaging-4.8.2.jar	64	762	5	0
1	axon-modelling-4.8.2.jar	10	150	4	1
2	axon-eventsourcing-4.8.2.jar	9	130	3	2
3	axon-test-4.8.2.jar	8	87	0	3
4	axon-configuration-4.8.2.jar	1	39	0	4
5	axon-disruptor-4.8.2.jar	1	22	1	3

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-4.8.2.jar	64	762	5	0
1	axon-modelling-4.8.2.jar	10	150	4	1
2	axon-eventsourcing-4.8.2.jar	9	130	3	2
3	axon-disruptor-4.8.2.jar	1	22	1	3
4	axon-configuration-4.8.2.jar	1	39	0	4
5	axon-test-4.8.2.jar	8	87	0	3

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-configuration-4.8.2.jar	1	39	0	4
1	axon-disruptor-4.8.2.jar	1	22	1	3
2	axon-test-4.8.2.jar	8	87	0	3
3	axon-eventsourcing-4.8.2.jar	9	130	3	2
4	axon-modelling-4.8.2.jar	10	150	4	1
5	axon-messaging-4.8.2.jar	64	762	5	0

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

	artifactName	packages	types	incomingDependencies	outgoingDependencies
0	axon-configuration-4.8.2.jar	1	39	0	4
1	axon-disruptor-4.8.2.jar	1	22	1	3
2	axon-test-4.8.2.jar	8	87	0	3
3	axon-eventsourcing-4.8.2.jar	9	130	3	2
4	axon-modelling-4.8.2.jar	10	150	4	1
5	axon-messaging-4.8.2.jar	64	762	5	0

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

	artifactName	packages	types	incomingDependencies	outgoingDependencies
0	axon-disruptor-4.8.2.jar	1	22	1	3
1	axon-configuration-4.8.2.jar	1	39	0	4
2	axon-test-4.8.2.jar	8	87	0	3
3	axon-eventsourcing-4.8.2.jar	9	130	3	2
4	axon-modelling-4.8.2.jar	10	150	4	1
5	axon-messaging-4.8.2.jar	64	762	5	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-configuration-4.8.2.jar	1	39	0	4
1	axon-test-4.8.2.jar	8	87	0	3
2	axon-disruptor-4.8.2.jar	1	22	1	3
3	axon-eventsourcing-4.8.2.jar	9	130	3	2
4	axon-modelling-4.8.2.jar	10	150	4	1
5	axon-messaging-4.8.2.jar	64	762	5	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-4.8.2.jar	64	762	5	0
1	axon-modelling-4.8.2.jar	10	150	4	1
2	axon-eventsourcing-4.8.2.jar	9	130	3	2
3	axon-disruptor-4.8.2.jar	1	22	1	3
4	axon-test-4.8.2.jar	8	87	0	3
5	axon-configuration-4.8.2.jar	1	39	0	4

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	forwardToBackwardBalance
0	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	0.882353
1	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	0.857143
2	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	0.853659
3	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging.annotation	0.840000
4	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.tracing	0.800000
5	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore	0.777778
6	axon-messaging-4.8.2	org.axonframework.deadline	axon-messaging-4.8.2	org.axonframework.tracing	0.750000
7	axon-messaging-4.8.2	org.axonframework.commandhandling.callbacks	axon-messaging-4.8.2	org.axonframework.commandhandling	0.733333
8	axon-messaging-4.8.2	org.axonframework.commandhandling	axon-messaging-4.8.2	org.axonframework.tracing	0.666667
9	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.serialization	0.647059
10	axon-messaging-4.8.2	org.axonframework.messaging.unitofwork	axon-messaging-4.8.2	org.axonframework.messaging	0.647059
11	axon-messaging-4.8.2	org.axonframework.eventhandling.async	axon-messaging-4.8.2	org.axonframework.eventhandling	0.538462
12	axon-messaging-4.8.2	org.axonframework.eventhandling.replay	axon-messaging-4.8.2	org.axonframework.eventhandling	0.454545
13	axon-messaging-4.8.2	org.axonframework.serialization.upcasting.event	axon-messaging-4.8.2	org.axonframework.eventhandling	0.333333
14	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	0.317073
15	axon-modelling-4.8.2	org.axonframework.modelling.command.inspection	axon-modelling-4.8.2	org.axonframework.modelling.command	0.250000
16	axon-messaging-4.8.2	org.axonframework.queryhandling.registration	axon-messaging-4.8.2	org.axonframework.queryhandling	0.250000
17	axon-messaging-4.8.2	org.axonframework.messaging	axon-messaging-4.8.2	org.axonframework.serialization	0.238095
18	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.eventhandling.tokenstore	0.230769
19	axon-messaging-4.8.2	org.axonframework.messaging.annotation	axon-messaging-4.8.2	org.axonframework.messaging.interceptors	0.200000
20	axon-modelling-4.8.2	org.axonframework.modelling.saga	axon-modelling-4.8.2	org.axonframework.modelling.saga.metamodel	0.142857
21	axon-messaging-4.8.2	org.axonframework.commandhandling.distributed....	axon-messaging-4.8.2	org.axonframework.commandhandling.distributed	0.076923

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	dependenc
0	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	GenericQueryMessage->ResponseTyp
1	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->ResponseTyp
2	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->PublisherResponseTyp
3	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	DefaultQueryGateway->ResponseTyp
4	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	QueryGateway->ResponseTyp
5	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	QueryMessage->ResponseTyp
6	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	SubscriptionQueryMessage->ResponseTyp
7	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->MultipleInstancesRes
8	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	GenericStreamingQueryMessage->ResponseTyp
9	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	GenericSubscriptionQueryMessage->ResponseTyp
10	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	SimpleQueryUpdateEmitter->OptionalResponseTyp
11	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	QueryGateway->ResponseTyp
12	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	GenericStreamingQueryMessage->PublisherRespons
13	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	QuerySubscription->ResponseTyp
14	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	QueryResponseMessage ConvertingResponseMessag
15	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	StreamingQueryMessage->ResponseTyp
16	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	SimpleQueryBus->ResponseTyp
17	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	AbstractEventBus$Builder->SpanFacto
18	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	AbstractEventProcessor->Spa
19	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	AbstractEventProcessor->SpanFacto
20	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	AbstractEventBus$Builder->NoOpSpanFacto
21	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	AbstractEventProcessor$Builder->SpanFacto
22	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	AbstractEventBus->SpanFacto
23	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	AbstractEventProcessor$Builder->NoOpSpanFacto
24	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	SubscribingEventProcessor$Builder->SpanFacto
25	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	TrackingEventProcessor$Builder->SpanFacto

	artifactName	packageName	dependentArtifactName	dependentPackageName	dependenc
26	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	EventMessage<-NestingSpanFacto
27	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	SimpleEventBus$Builder->SpanFacto
28	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	AbstractEventBus->Spa
29	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	TrackingEventProcessor->Spa
30	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	TrackingEventProcessor->SpanFacto
31	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	GenericDomainEventMessage->Messag
32	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	SequenceNumberParameterResolverFactory$Sequenc
33	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	GenericDomainEventMessage->MetaDa
34	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	DomainEventMessage->Messag
35	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	EventMessage<-Heade
36	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	AnnotationEventHandlerAdapter->Messag
37	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	GenericDomainEventMessage->GenericMessag
38	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	AbstractEventProcessor->MessageHandlerIntercept
39	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	AbstractEventProcessor->ResultMessag

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	depe
0	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.messaging.responsetypes	QueryResponseMes ConvertingResponseM
1	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.tracing	EventMessage<-NestingSpan
2	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	DomainEventMessage<-H
3	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	EventMessage<-H
4	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging	Tracking StreamableMessage
5	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging.annotation	DomainEventMes AggregateTypeParameter
6	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.messaging.annotation	DomainEventMes SourceIdParameterRes
7	axon-messaging-4.8.2	org.axonframework.queryhandling	axon-messaging-4.8.2	org.axonframework.tracing	QueryMessage<-Sp
8	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore	EventStrear AbstractEventStorage
9	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore	EventStreamUtils<-DomainEvent
10	axon-messaging-4.8.2	org.axonframework.deadline	axon-messaging-4.8.2	org.axonframework.tracing	DeadlineMessage<-Sp
11	axon-messaging-4.8.2	org.axonframework.commandhandling.callbacks	axon-messaging-4.8.2	org.axonframework.commandhandling	LoggingCal SimpleCommandBus$
12	axon-messaging-4.8.2	org.axonframework.commandhandling.callbacks	axon-messaging-4.8.2	org.axonframework.commandhandling	NoOpCal SimpleCommandBus$
13	axon-messaging-4.8.2	org.axonframework.commandhandling	axon-messaging-4.8.2	org.axonframework.tracing	CommandMessage<-Sp
14	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.serialization	GapAwareTracking GapAwareTrackingTok
15	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.serialization	GenericDomainEventMes AbstractXStrea
16	axon-messaging-4.8.2	org.axonframework.eventhandling	axon-messaging-4.8.2	org.axonframework.serialization	GenericEventMes AbstractXStreamS
17	axon-messaging-4.8.2	org.axonframework.messaging.unitofwork	axon-messaging-4.8.2	org.axonframework.messaging	UnitOfWork<-DefaultIntercept
18	axon-messaging-4.8.2	org.axonframework.messaging.unitofwork	axon-messaging-4.8.2	org.axonframework.messaging	CurrentUnitOfWork<-GenericM
19	axon-messaging-4.8.2	org.axonframework.messaging.unitofwork	axon-messaging-4.8.2	org.axonframework.messaging	UnitO MessageHandlerInte
20	axon-messaging-4.8.2	org.axonframework.eventhandling.async	axon-messaging-4.8.2	org.axonframework.eventhandling	SequentialPerAggregate SimpleEvent
21	axon-messaging-4.8.2	org.axonframework.eventhandling.async	axon-messaging-4.8.2	org.axonframework.eventhandling	Sequencing SimpleEventHandler
22	axon-messaging-4.8.2	org.axonframework.eventhandling.async	axon-messaging-4.8.2	org.axonframework.eventhandling	Sequencing SimpleEventHandlerInvok
23	axon-messaging-4.8.2	org.axonframework.eventhandling.replay	axon-messaging-4.8.2	org.axonframework.eventhandling	GenericResetC AnnotationEventHandl
24	axon-messaging-4.8.2	org.axonframework.eventhandling.replay	axon-messaging-4.8.2	org.axonframework.eventhandling	ResetC AnnotationEventHandler
25	axon-messaging-4.8.2	org.axonframework.eventhandling.replay	axon-messaging-4.8.2	org.axonframework.eventhandling	ResetContext<-Reset

	artifactName	packageName	dependentArtifactName	dependentPackageName	depe
26	axon-messaging-4.8.2	org.axonframework.serialization.upcasting.event	axon-messaging-4.8.2	org.axonframework.eventhandling	IntermediateEventRepresen Ev
27	axon-messaging-4.8.2	org.axonframework.serialization.upcasting.event	axon-messaging-4.8.2	org.axonframework.eventhandling	EventUpcaster<-Ev
28	axon-messaging-4.8.2	org.axonframework.serialization.upcasting.event	axon-messaging-4.8.2	org.axonframework.eventhandling	InitialEventRepresentation<-Ev
29	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc AppendSnapshotStatemen
30	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc CreateTokenAtStatemen
31	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc CreateTailTokenStatemen
32	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc ReadSnapshotDataStatemen
33	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc ReadEventDataForAggregateStat
34	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc LastSequenceNumberForStateme
35	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc DeleteSnapshotsStatemen
36	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc JdbcEventStorageEngineStat
37	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc CreateHeadTokenStatemen
38	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc CleanGapsStatemen
39	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	axon-eventsourcing-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	EventSc FetchTrackedEventsStatemen

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	18
1	org.axonframework.eventhandling.DomainEventMes...	10	[getSequenceNumber]	1	9
2	org.axonframework.eventhandling.EventMessage	9	[getIdentifier, getTimestamp]	2	9
3	org.axonframework.eventhandling.TrackedEventMe...	10	[trackingToken]	1	8
4	org.axonframework.eventhandling.EventMessage	9	[getIdentifier]	1	8
5	org.axonframework.eventhandling.DomainEventMes...	10	[getType, getAggregateIdentifier, getSequenceN...	3	6
6	org.axonframework.messaging.ResultMessage	9	[exceptionResult, isExceptional]	2	6
7	org.axonframework.commandhandling.GenericComma...	14	[asCommandResultMessage]	1	5
8	org.axonframework.deadline.GenericDeadlineMessage	11	[asDeadlineMessage]	1	5
9	org.axonframework.eventhandling.TrackedEventMe...	12	[trackingToken]	1	4
10	org.axonframework.deadline.DeadlineMessage	10	[getDeadlineName]	1	4
11	org.axonframework.eventhandling.DomainEventMes...	10	[getAggregateIdentifier]	1	4
12	org.axonframework.eventhandling.DomainEventMes...	10	[getType]	1	4
13	org.axonframework.eventhandling.GenericEventMe...	10	[asEventMessage]	1	4
14	org.axonframework.common.transaction.NoTransac...	4	[instance]	1	4
15	org.axonframework.commandhandling.GenericComma...	15	[asCommandResultMessage]	1	3
16	org.axonframework.modelling.command.inspection...	13	[type]	1	3
17	org.axonframework.eventhandling.DomainEventMes...	11	[getType, getAggregateIdentifier, getSequenceN...	3	3
18	org.axonframework.eventhandling.GenericEventMe...	11	[asEventMessage]	1	3
19	org.axonframework.eventhandling.DomainEventMes...	10	[getAggregateIdentifier, getSequenceNumber]	2	3
20	org.axonframework.eventhandling.GapAwareTracki...	10	[advanceTo, newInstance, withGapsTruncatedAt, ...	5	3
21	org.axonframework.eventhandling.EventMessage	9	[getTimestamp]	1	3
22	org.axonframework.messaging.MessageDecorator	9	[describeTo]	1	3
23	org.axonframework.eventhandling.TrackedEventData	5	[trackingToken]	1	3
24	org.axonframework.eventhandling.tokenstore.Con...	5	[get]	1	3
25	org.axonframework.modelling.command.inspection...	17	[initialize, initSequence, getAggregateRoot]	4	2
26	org.axonframework.queryhandling.SimpleQueryUpd...	17	[builder]	1	2
27	org.axonframework.commandhandling.CommandMessa...	14	[commandName, isFactoryHandler]	2	2
28	org.axonframework.commandhandling.GenericComma...	14	[asCommandResultMessage]	2	2
29	org.axonframework.deadline.DeadlineMessage	14	[getDeadlineName]	1	2
30	org.axonframework.messaging.GenericResultMessage	14	[asResultMessage]	1	2
31	org.axonframework.messaging.annotation.Wrapped...	14	[handle]	1	2
32	org.axonframework.eventhandling.DomainEventMes...	13	[getAggregateIdentifier, getSequenceNumber]	2	2
33	org.axonframework.eventhandling.ReplayToken	13	[isReplay]	1	2
34	org.axonframework.eventhandling.ReplayToken	13	[createReplayToken]	1	2
35	org.axonframework.queryhandling.SubscriptionQu...	12	[getUpdateResponseType]	1	2
36	org.axonframework.commandhandling.GenericComma...	11	[asCommandMessage]	1	2
37	org.axonframework.eventhandling.DomainEventMes...	11	[getSequenceNumber]	1	2
38	org.axonframework.eventhandling.TrackedEventMe...	11	[trackingToken, withTrackingToken]	2	2
39	org.axonframework.eventhandling.TrackedEventMe...	11	[trackingToken]	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	numberOfUsingPackages
0	org.axonframework.common.BuilderUtils	BuilderUtils	[Type, File, Java, Class, ByteCode, TopCentral...	44
1	org.axonframework.messaging.Message	Message	[Type, File, Java, ByteCode, GenericDeclaratio...	39
2	org.axonframework.common.AxonConfigurationExce...	AxonConfigurationException	[Type, File, Java, Class, ByteCode, TopCentral...	37
3	org.axonframework.messaging.MetaData	MetaData	[Type, File, Java, Class, ByteCode, TopCentral...	33
4	org.axonframework.eventhandling.EventMessage	EventMessage	[Type, File, Java, ByteCode, GenericDeclaratio...	32
5	org.axonframework.messaging.unitofwork.UnitOfWork	UnitOfWork	[Type, File, Java, ByteCode, GenericDeclaratio...	31
6	org.axonframework.serialization.Serializer	Serializer	[Type, File, Java, ByteCode, Interface, TopCen...	29
7	org.axonframework.common.Assert	Assert	[Type, File, Java, Class, ByteCode, TopCentral...	27
8	org.axonframework.common.transaction.Transacti...	TransactionManager	[Type, File, Java, ByteCode, Interface, TopCen...	27
9	org.axonframework.serialization.SerializedObject	SerializedObject	[Type, File, Java, ByteCode, GenericDeclaratio...	25
10	org.axonframework.serialization.SerializedType	SerializedType	[Type, File, Java, ByteCode, Interface, TopCen...	24
11	org.axonframework.messaging.unitofwork.Current...	CurrentUnitOfWork	[Type, File, Java, Class, ByteCode, TopCentral...	21
12	org.axonframework.common.AxonNonTransientExcep...	AxonNonTransientException	[Type, File, Java, Class, ByteCode, TopCentral...	18
13	org.axonframework.eventhandling.DomainEventMes...	DomainEventMessage	[Type, File, Java, ByteCode, GenericDeclaratio...	18
14	org.axonframework.eventhandling.GenericEventMe...	GenericEventMessage	[Type, File, Java, Class, ByteCode, GenericDec...	18
15	org.axonframework.messaging.annotation.Paramet...	ParameterResolverFactory	[Type, File, Java, ByteCode, Interface, TypeWe...	18
16	org.axonframework.eventhandling.TrackingToken	TrackingToken	[Type, File, Java, ByteCode, Interface, TopCen...	18
17	org.axonframework.common.Registration	Registration	[Type, File, Java, ByteCode, Interface, TypeWe...	17
18	org.axonframework.serialization.SimpleSerializ...	SimpleSerializedObject	[Type, File, Java, Class, ByteCode, GenericDec...	17
19	org.axonframework.messaging.MessageHandlerInte...	MessageHandlerInterceptor	[Type, File, Java, ByteCode, GenericDeclaratio...	16
20	org.axonframework.common.ObjectUtils	ObjectUtils	[Type, File, Java, Class, ByteCode, TypeWeakly...	16
21	org.axonframework.tracing.SpanFactory	SpanFactory	[Type, File, Java, ByteCode, Interface, TypeWe...	16
22	org.axonframework.messaging.MessageDispatchInt...	MessageDispatchInterceptor	[Type, File, Java, ByteCode, GenericDeclaratio...	15
23	org.axonframework.commandhandling.CommandMessage	CommandMessage	[Type, File, Java, ByteCode, GenericDeclaratio...	14
24	org.axonframework.messaging.unitofwork.Default...	DefaultUnitOfWork	[Type, File, Java, Class, ByteCode, GenericDec...	14
25	org.axonframework.messaging.annotation.Handler...	HandlerDefinition	[Type, File, Java, ByteCode, Interface, TypeWe...	14
26	org.axonframework.common.ReflectionUtils	ReflectionUtils	[Type, File, Java, Class, ByteCode, TypeWeakly...	14
27	org.axonframework.eventhandling.EventBus	EventBus	[Type, File, Java, ByteCode, Interface, TypeWe...	13
28	org.axonframework.messaging.InterceptorChain	InterceptorChain	[Type, File, Java, ByteCode, Interface, TypeWe...	13
29	org.axonframework.lifecycle.Lifecycle	Lifecycle	[Type, File, Java, ByteCode, Interface, TypeWe...	13
30	org.axonframework.lifecycle.Lifecycle$Lifecycl...	Lifecycle$LifecycleRegistry	[Type, File, Java, ByteCode, Interface, TypeWe...	13
31	org.axonframework.common.transaction.NoTransac...	NoTransactionManager	[Type, File, Java, ByteCode, Enum, TypeWeaklyC...	13
32	org.axonframework.messaging.ResultMessage	ResultMessage	[Type, File, Java, ByteCode, GenericDeclaratio...	13
33	org.axonframework.common.DateTimeUtils	DateTimeUtils	[Type, File, Java, Class, ByteCode, TypeWeakly...	12
34	org.axonframework.messaging.DefaultInterceptor...	DefaultInterceptorChain	[Type, File, Java, Class, ByteCode, GenericDec...	12
35	org.axonframework.tracing.NoOpSpanFactory	NoOpSpanFactory	[Type, File, Java, Class, ByteCode, TypeWeakly...	12
36	org.axonframework.messaging.ScopeDescriptor	ScopeDescriptor	[Type, File, Java, ByteCode, Interface, TypeWe...	12
37	org.axonframework.tracing.Span	Span	[Type, File, Java, ByteCode, Interface, TypeWe...	12
38	org.axonframework.common.AxonTransientException	AxonTransientException	[Type, File, Java, Class, ByteCode, TypeWeakly...	11
39	org.axonframework.messaging.annotation.Classpa...	ClasspathHandlerDefinition	[Type, File, Java, Class, ByteCode, TypeWeakly...	11

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	dependentFullQualifiedPackageNames
0	axon-disruptor-4.8.2	axon-messaging-4.8.2	9	64	0.140625	[org.axonframework.common, org.axonframework.c...
1	axon-test-4.8.2	axon-messaging-4.8.2	10	64	0.156250	[org.axonframework.common, org.axonframework.e...
2	axon-disruptor-4.8.2	axon-modelling-4.8.2	2	10	0.200000	[org.axonframework.modelling.command, org.axon...
3	axon-eventsourcing-4.8.2	axon-modelling-4.8.2	2	10	0.200000	[org.axonframework.modelling.command, org.axon...
4	axon-disruptor-4.8.2	axon-eventsourcing-4.8.2	2	9	0.222222	[org.axonframework.eventsourcing, org.axonfram...
5	axon-test-4.8.2	axon-eventsourcing-4.8.2	2	9	0.222222	[org.axonframework.eventsourcing.eventstore, o...
6	axon-modelling-4.8.2	axon-messaging-4.8.2	18	64	0.281250	[org.axonframework.eventhandling, org.axonfram...
7	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	20	64	0.312500	[org.axonframework.eventhandling, org.axonfram...
8	axon-configuration-4.8.2	axon-eventsourcing-4.8.2	4	9	0.444444	[org.axonframework.eventsourcing.eventstore.jp...
9	axon-test-4.8.2	axon-modelling-4.8.2	5	10	0.500000	[org.axonframework.modelling.saga.repository, ...
10	axon-configuration-4.8.2	axon-messaging-4.8.2	34	64	0.531250	[org.axonframework.queryhandling, org.axonfram...
11	axon-modelling-4.8.2	axon-modelling-4.8.2	6	10	0.600000	[org.axonframework.modelling.saga, org.axonfra...
12	axon-configuration-4.8.2	axon-modelling-4.8.2	6	10	0.600000	[org.axonframework.modelling.command.inspectio...
13	axon-test-4.8.2	axon-test-4.8.2	5	8	0.625000	[org.axonframework.test, org.axonframework.tes...
14	axon-messaging-4.8.2	axon-messaging-4.8.2	41	64	0.640625	[org.axonframework.commandhandling, org.axonfr...
15	axon-eventsourcing-4.8.2	axon-eventsourcing-4.8.2	7	9	0.777778	[org.axonframework.eventsourcing.eventstore, o...
16	axon-configuration-4.8.2	axon-disruptor-4.8.2	1	1	1.000000	[org.axonframework.disruptor.commandhandling]

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	dependentPackageT
0	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.snapshotting	org.axonframework.eventhandling	1	
1	axon-modelling-4.8.2	axon-messaging-4.8.2	org.axonframework.modelling.saga.metamodel	org.axonframework.eventhandling	1	
2	axon-test-4.8.2	axon-messaging-4.8.2	org.axonframework.test.matchers	org.axonframework.eventhandling	1	
3	axon-eventsourcing-4.8.2	axon-modelling-4.8.2	org.axonframework.eventsourcing.conflictresolu...	org.axonframework.modelling.command	1	
4	axon-eventsourcing-4.8.2	axon-modelling-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	org.axonframework.modelling.command	1	
5	axon-test-4.8.2	axon-messaging-4.8.2	org.axonframework.test.eventscheduler	org.axonframework.eventhandling	2	
6	axon-modelling-4.8.2	axon-messaging-4.8.2	org.axonframework.modelling.command.legacyjpa	org.axonframework.eventhandling	2	
7	axon-modelling-4.8.2	axon-messaging-4.8.2	org.axonframework.modelling.command	org.axonframework.eventhandling	2	
8	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.conflictresolu...	org.axonframework.eventhandling	2	
9	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.eventstore	org.axonframework.messaging	1	
10	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.conflictresolu...	org.axonframework.messaging	1	
11	axon-test-4.8.2	axon-messaging-4.8.2	org.axonframework.test.matchers	org.axonframework.messaging	1	
12	axon-test-4.8.2	axon-messaging-4.8.2	org.axonframework.test	org.axonframework.messaging	1	
13	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.eventstore.jpa	org.axonframework.serialization	1	
14	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.eventstore.leg...	org.axonframework.serialization	1	
15	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.eventstore.jdbc	org.axonframework.serialization	1	
16	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	org.axonframework.eventhandling	3	
17	axon-test-4.8.2	axon-modelling-4.8.2	org.axonframework.test.utils	org.axonframework.modelling.saga	1	
18	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.conflictresolu...	org.axonframework.commandhandling	1	
19	axon-test-4.8.2	axon-messaging-4.8.2	org.axonframework.test.matchers	org.axonframework.commandhandling	1	
20	axon-test-4.8.2	axon-messaging-4.8.2	org.axonframework.test.server	org.axonframework.common	1	
21	axon-test-4.8.2	axon-messaging-4.8.2	org.axonframework.test.utils	org.axonframework.common	1	
22	axon-test-4.8.2	axon-messaging-4.8.2	org.axonframework.test.eventscheduler	org.axonframework.common	1	
23	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.snapshotting	org.axonframework.common	1	
24	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.eventstore.jdb...	org.axonframework.common	1	
25	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.conflictresolu...	org.axonframework.common	1	
26	axon-modelling-4.8.2	axon-messaging-4.8.2	org.axonframework.modelling.command.legacyjpa	org.axonframework.common	1	
27	axon-test-4.8.2	axon-messaging-4.8.2	org.axonframework.test	org.axonframework.messaging.annotation	2	
28	axon-modelling-4.8.2	axon-messaging-4.8.2	org.axonframework.modelling.command.legacyjpa	org.axonframework.messaging.annotation	2	

	artifactName	dependentArtifactName	packageName	dependentPackage.fqn	dependentTypes	dependentPackageT
29	axon-eventsourcing-4.8.2	axon-messaging-4.8.2	org.axonframework.eventsourcing.conflictresolu...	org.axonframework.messaging.annotation	2	