

CQRS

from the trenches

Welcome!



Outline

Terms & Architecture

Reads & Writes

State [+ demo]

Event Sourcing & Replay [+ demo]

CQRS - from the trenches

General evaluation

Terms

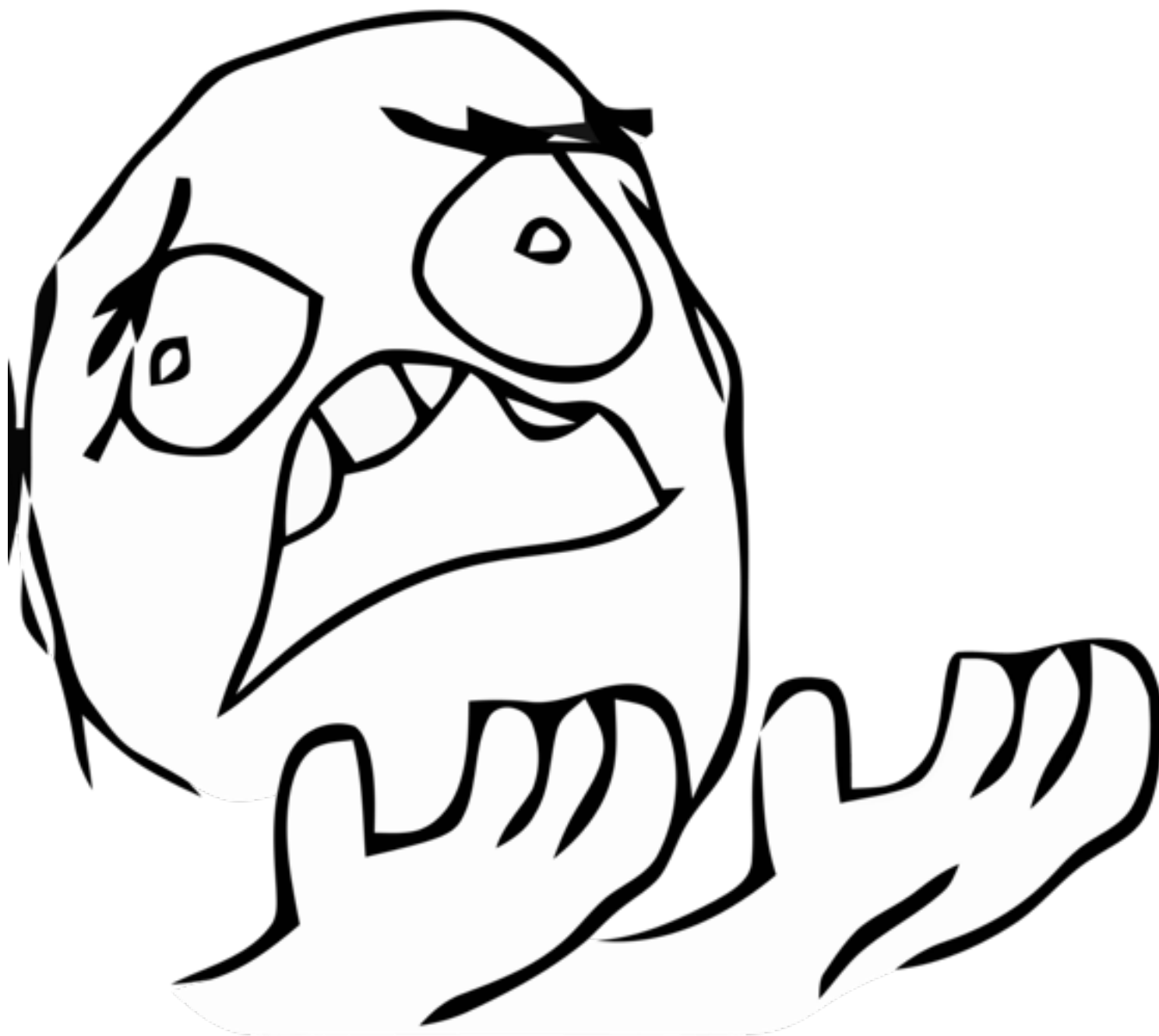
CQRS - Command, Query Responsibility Segregation (Greg Young, Udi Dahan)

Segregate operations that read data from operations that update data by using separate interfaces.

CQS - Command, Query Separation (Bertrand Meyer, OOSC, 1988)

A method should either change the state of an object, or return a result, but not both.

WHY?!?!?



Terms

Command - something the system has to do.

It's a combination of expressed intent (which describes what you want to do) as well as the information required to take action based on that intent.

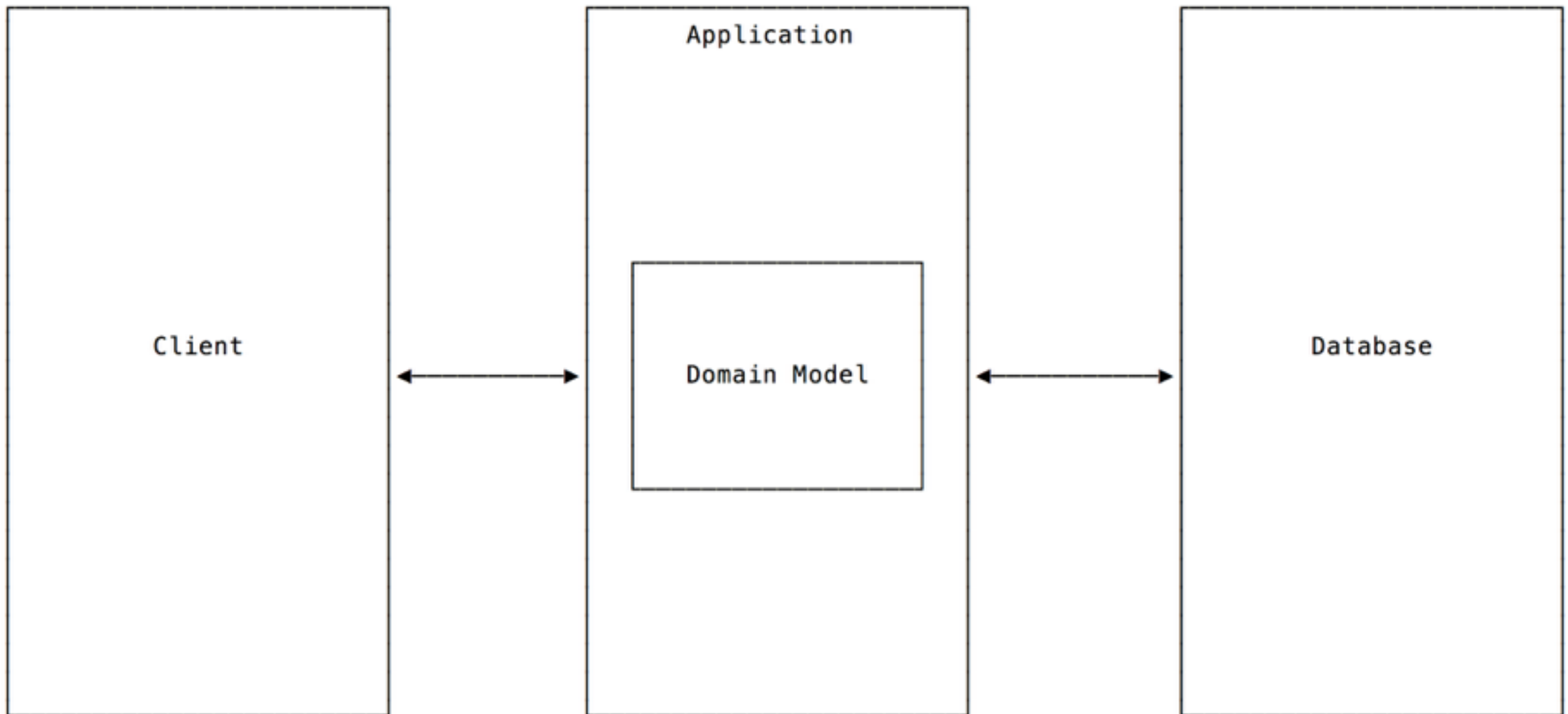
Examples: LoginUser or AddToCart or StartMachine.

Terms

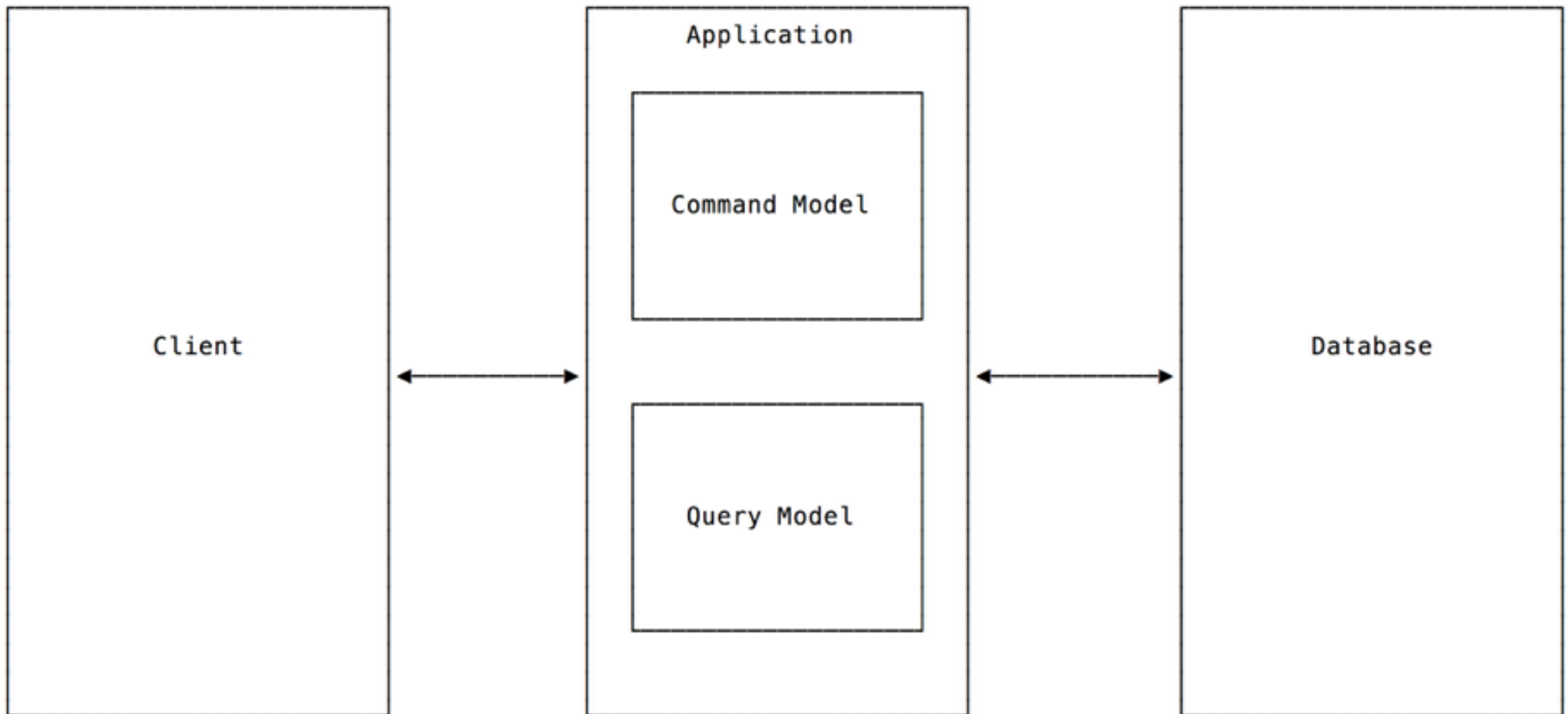
Query - a question or a request for information about something.

Examples: getAllUsers, listAllItemsInCart, getCurrentMachineState.

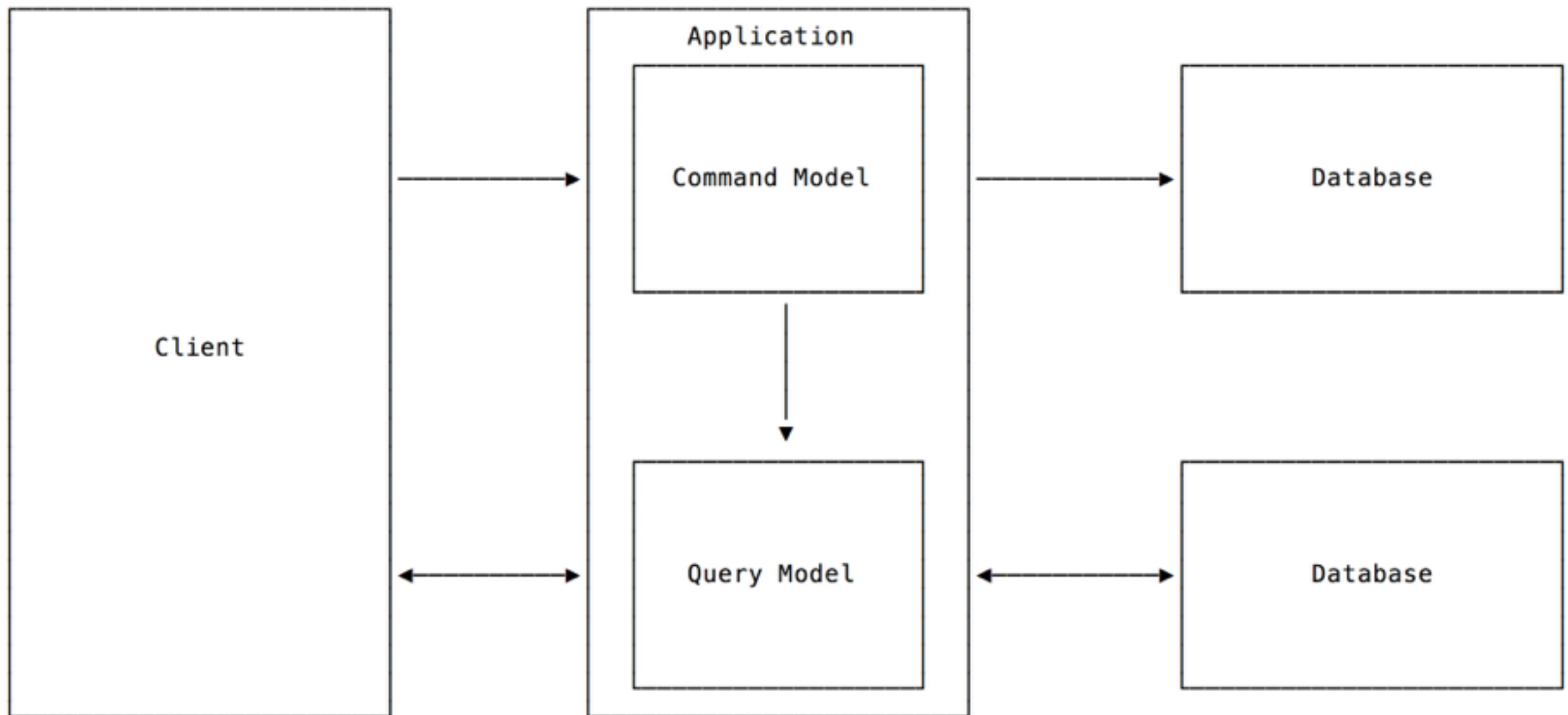
Architecture



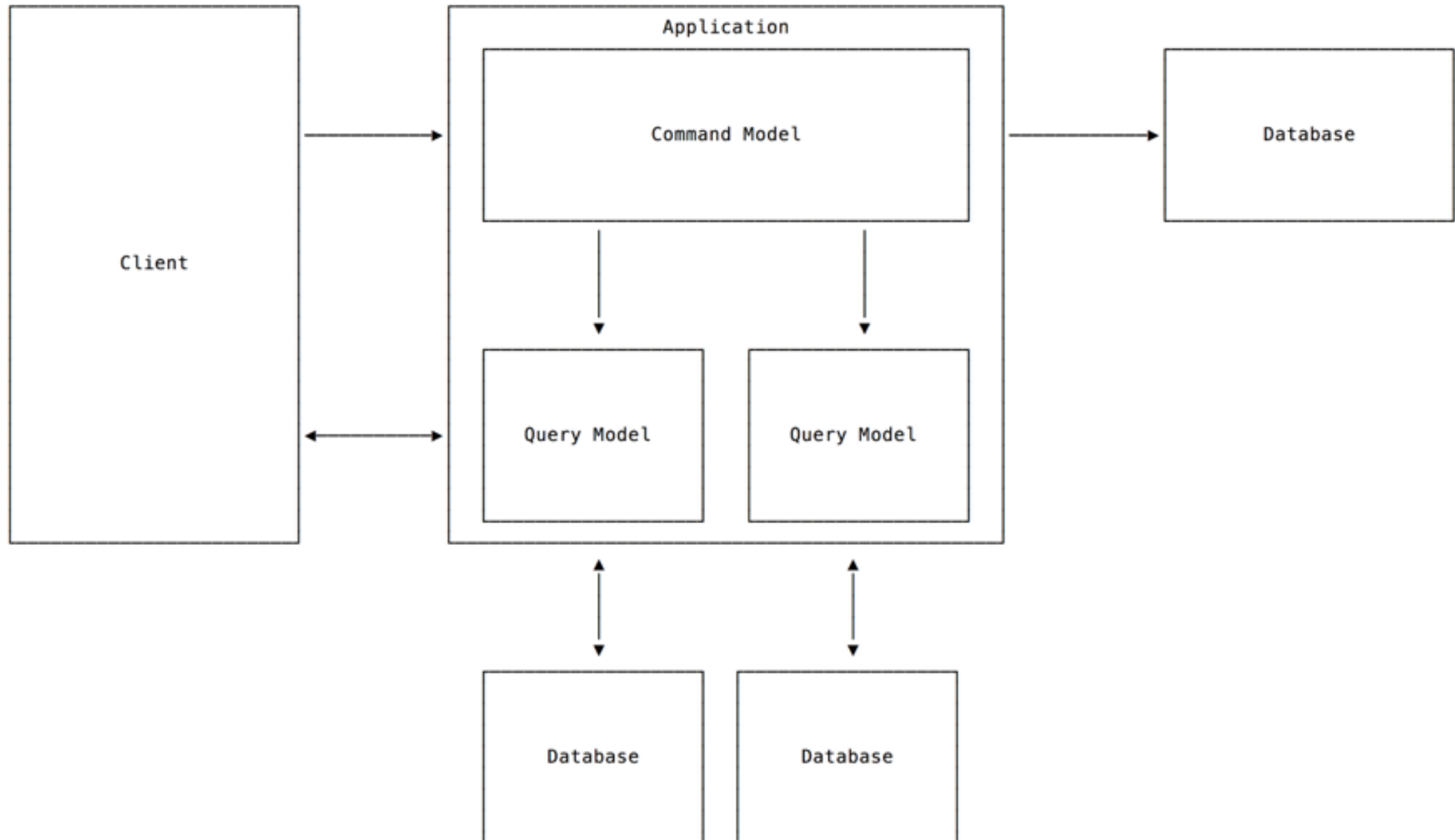
Architecture



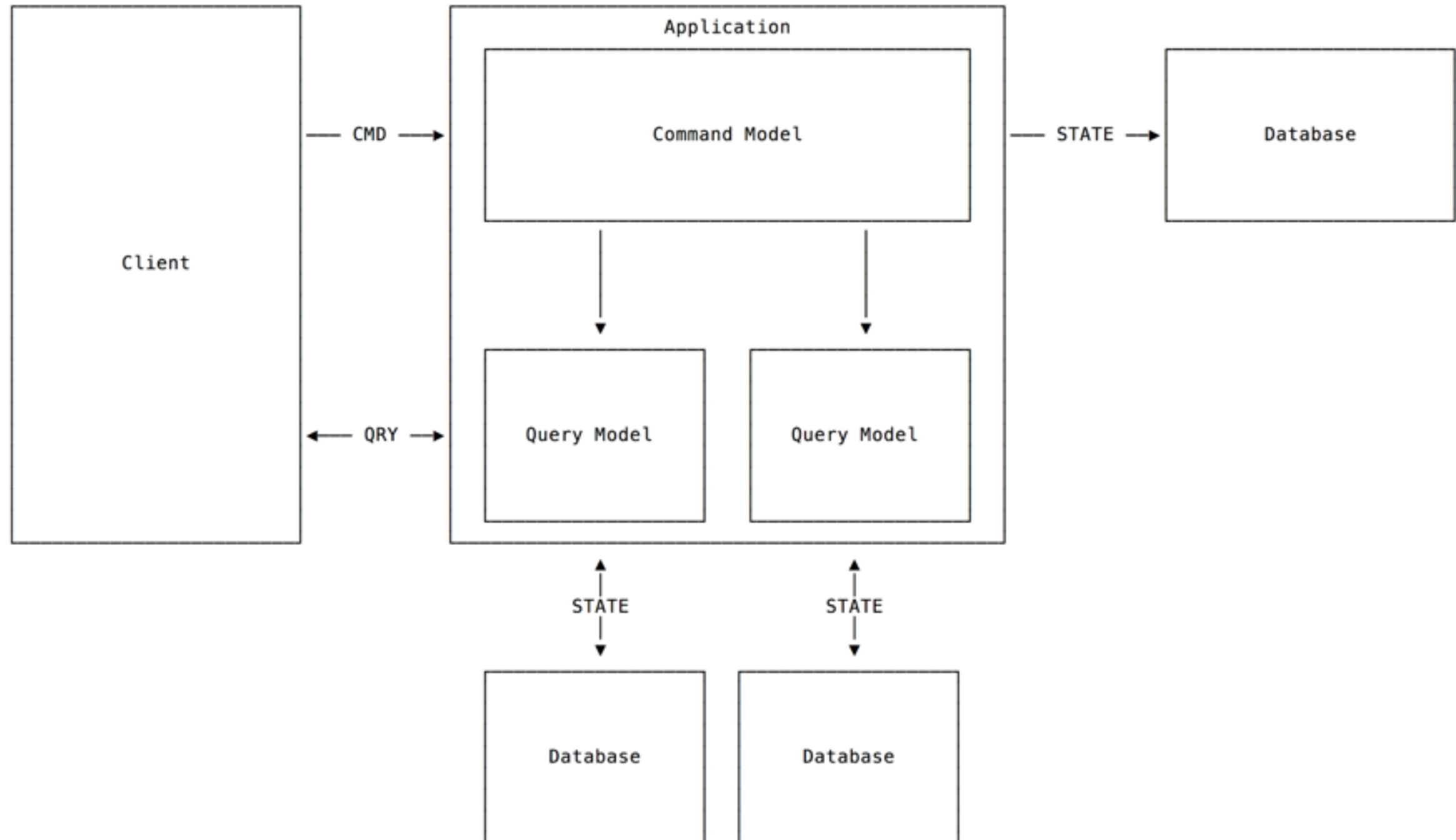
Architecture



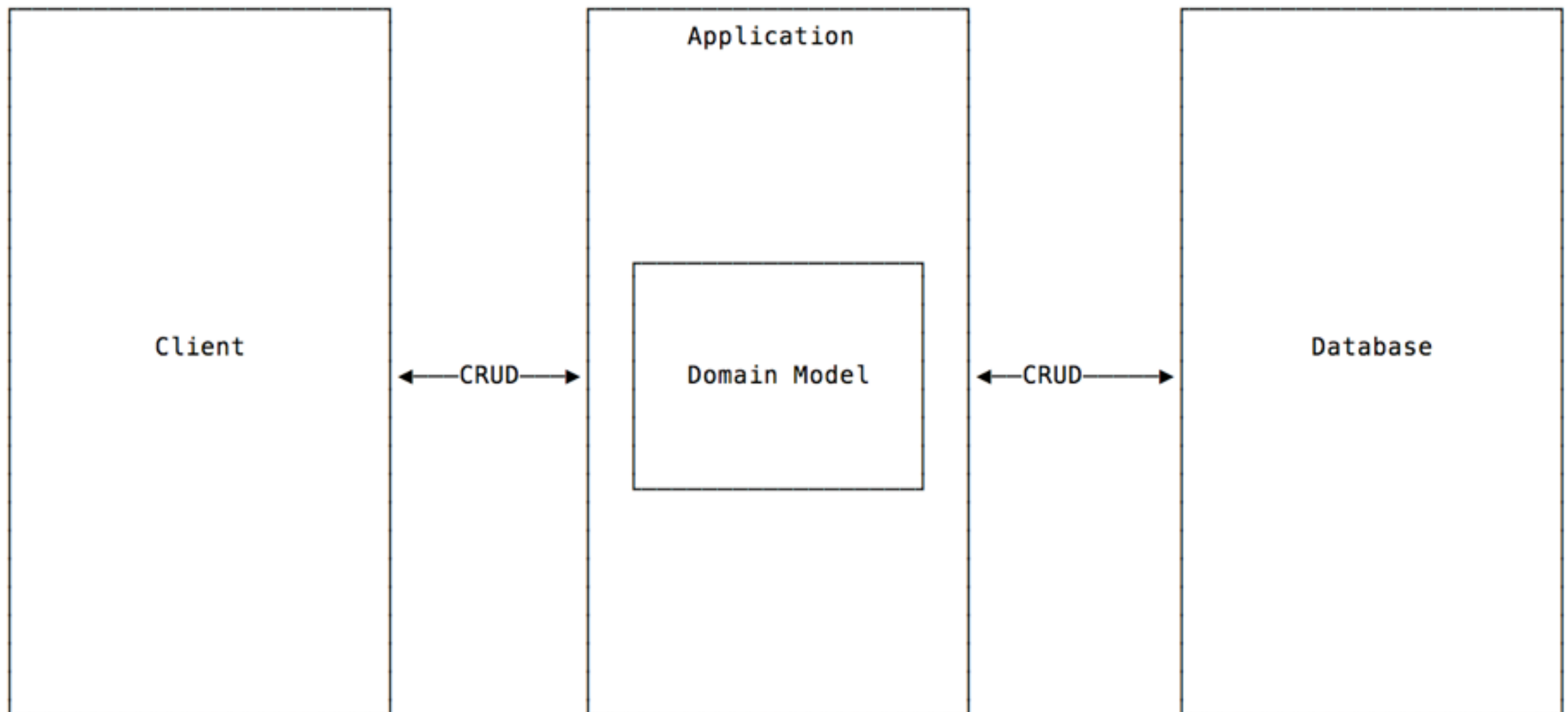
Architecture



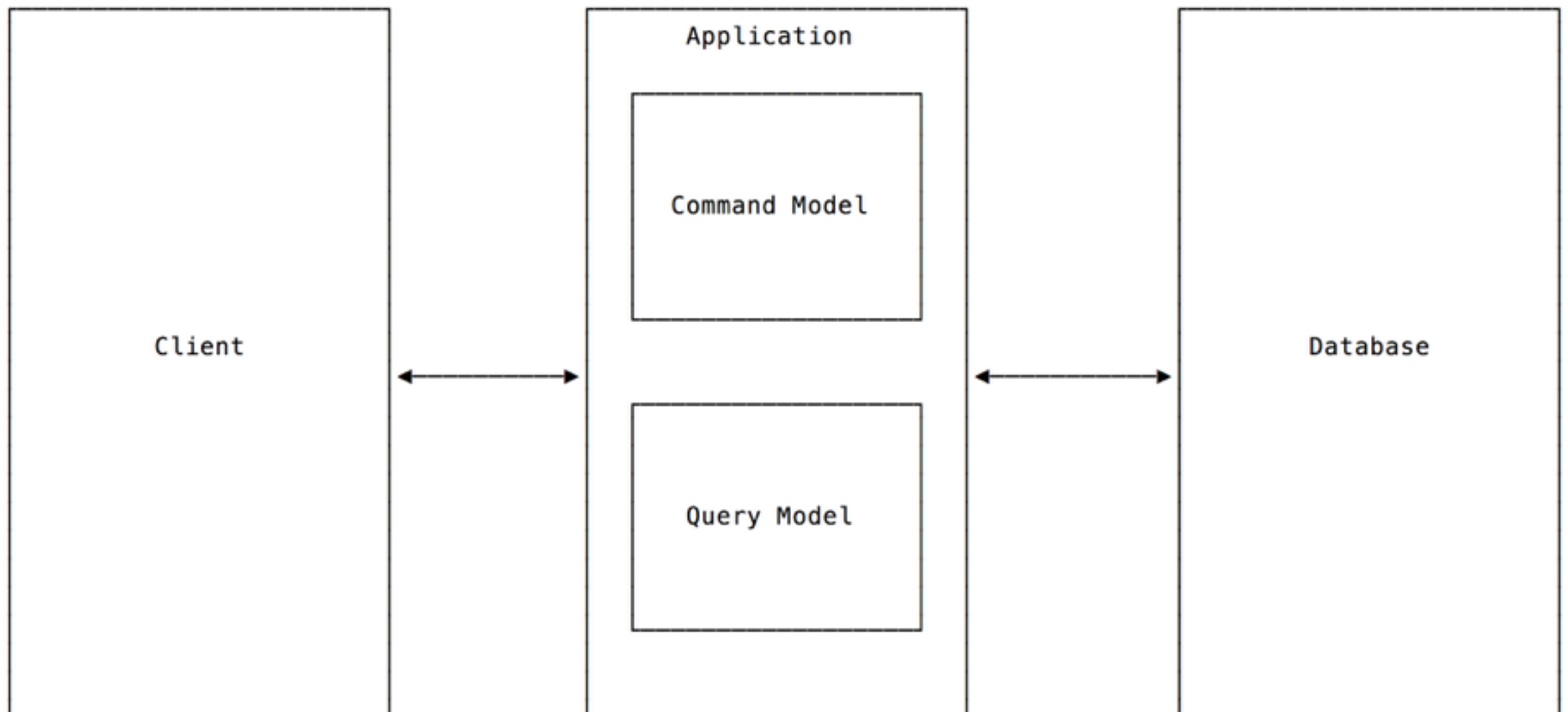
Architecture & Terms



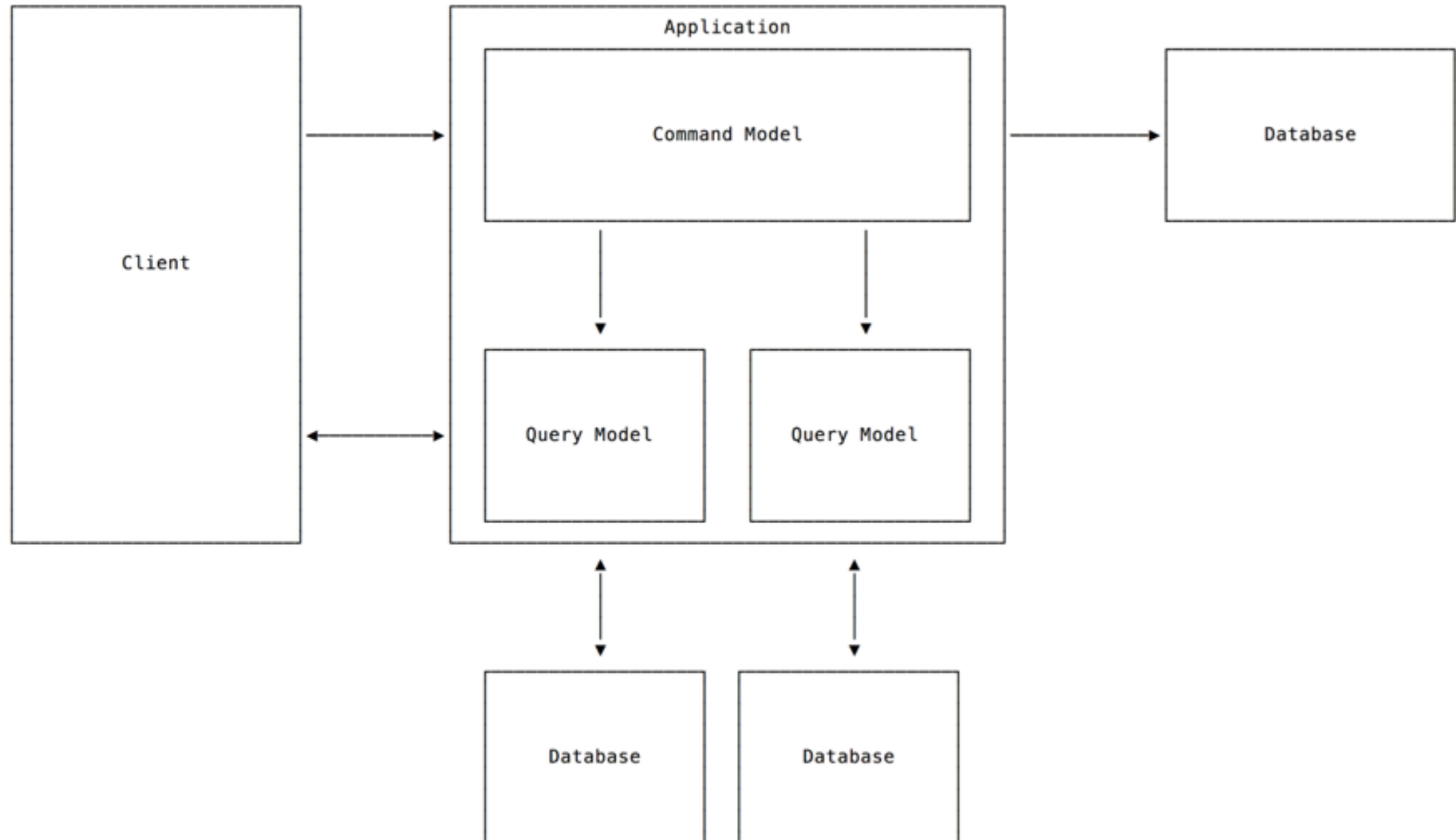
Reads & Writes



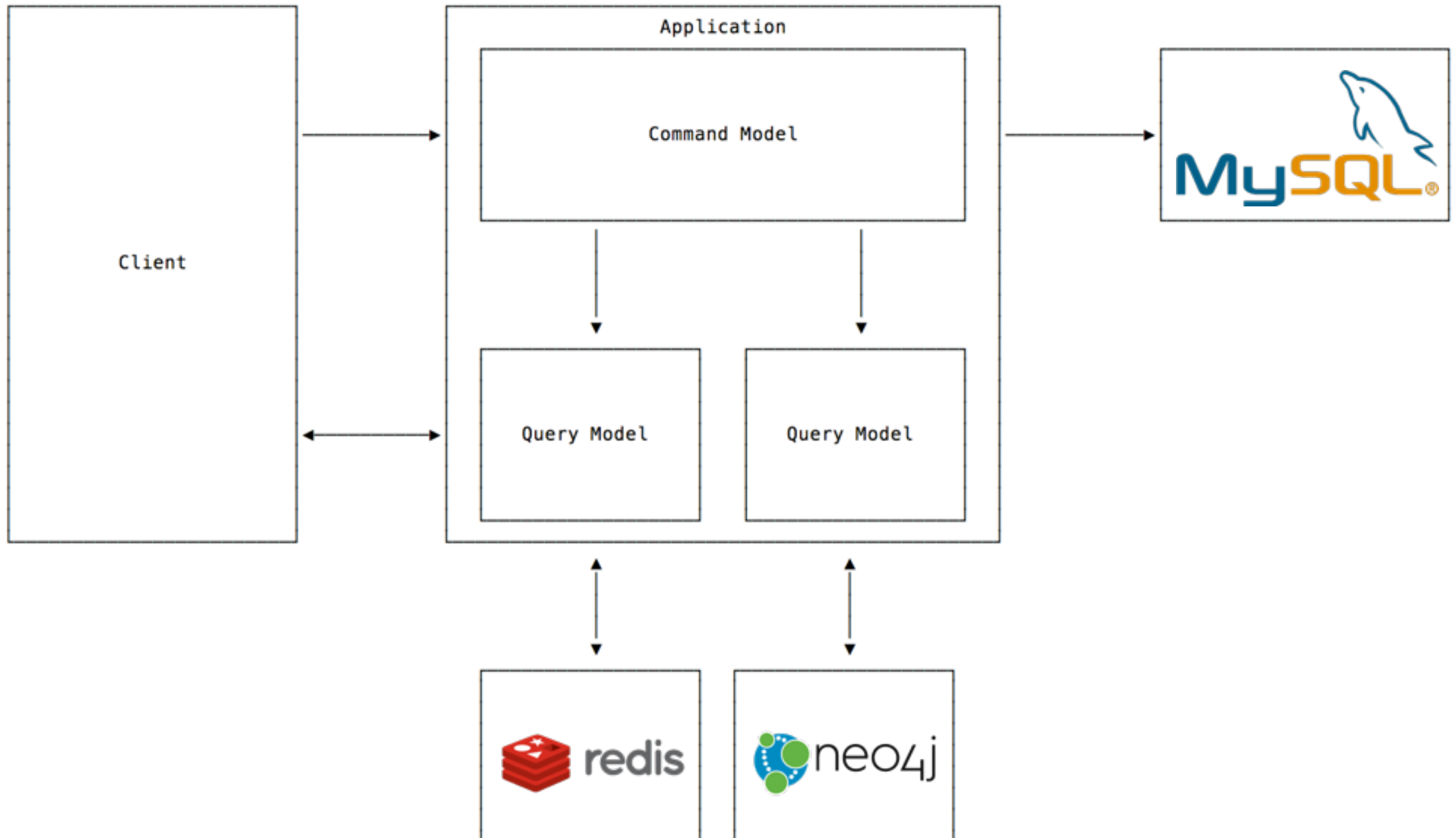
Reads & Writes



Reads & Writes



Reads & Writes



Reads & Writes

CQS - Command, Query Separation (Bertrand Meyer, OOSC, 1988)

A method should either change the state of an object, or return a result, but not both.

Commands

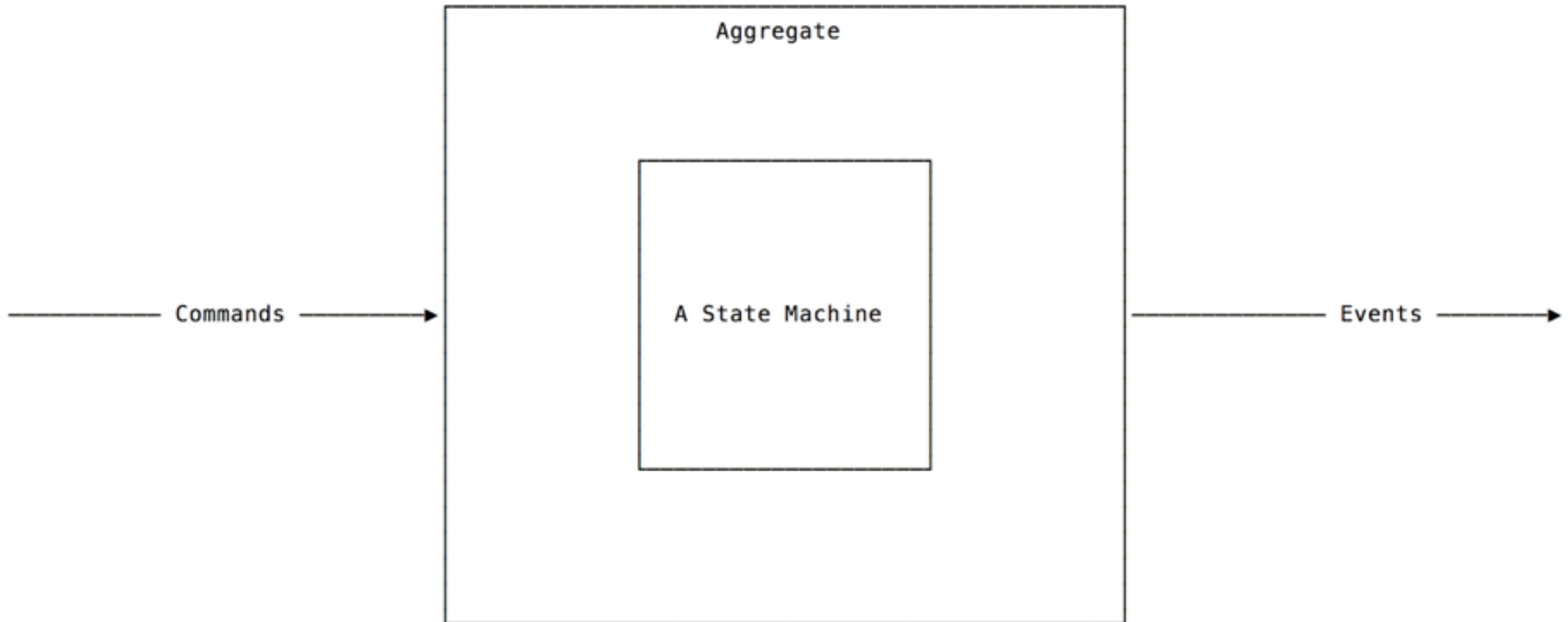


Queries

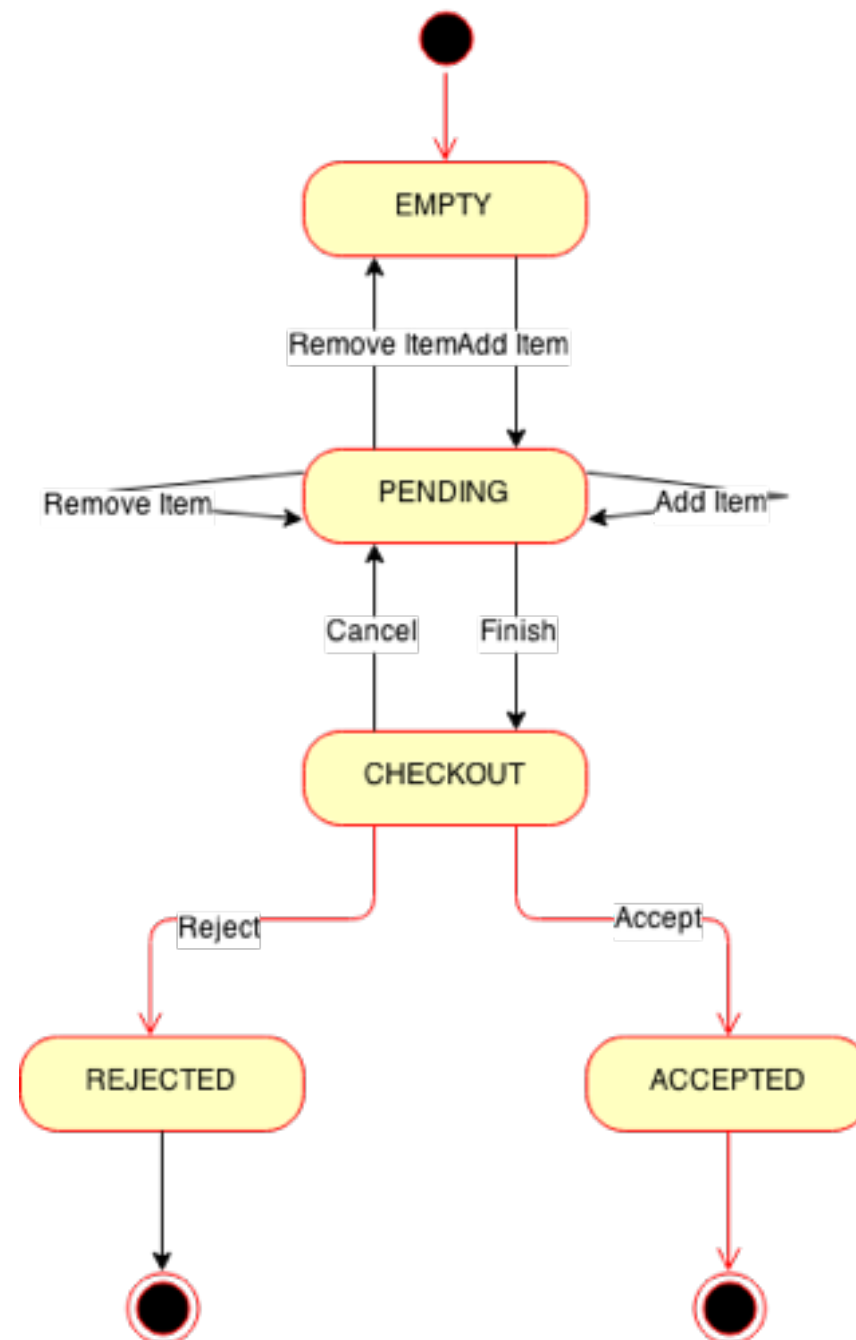


Demo

State



State



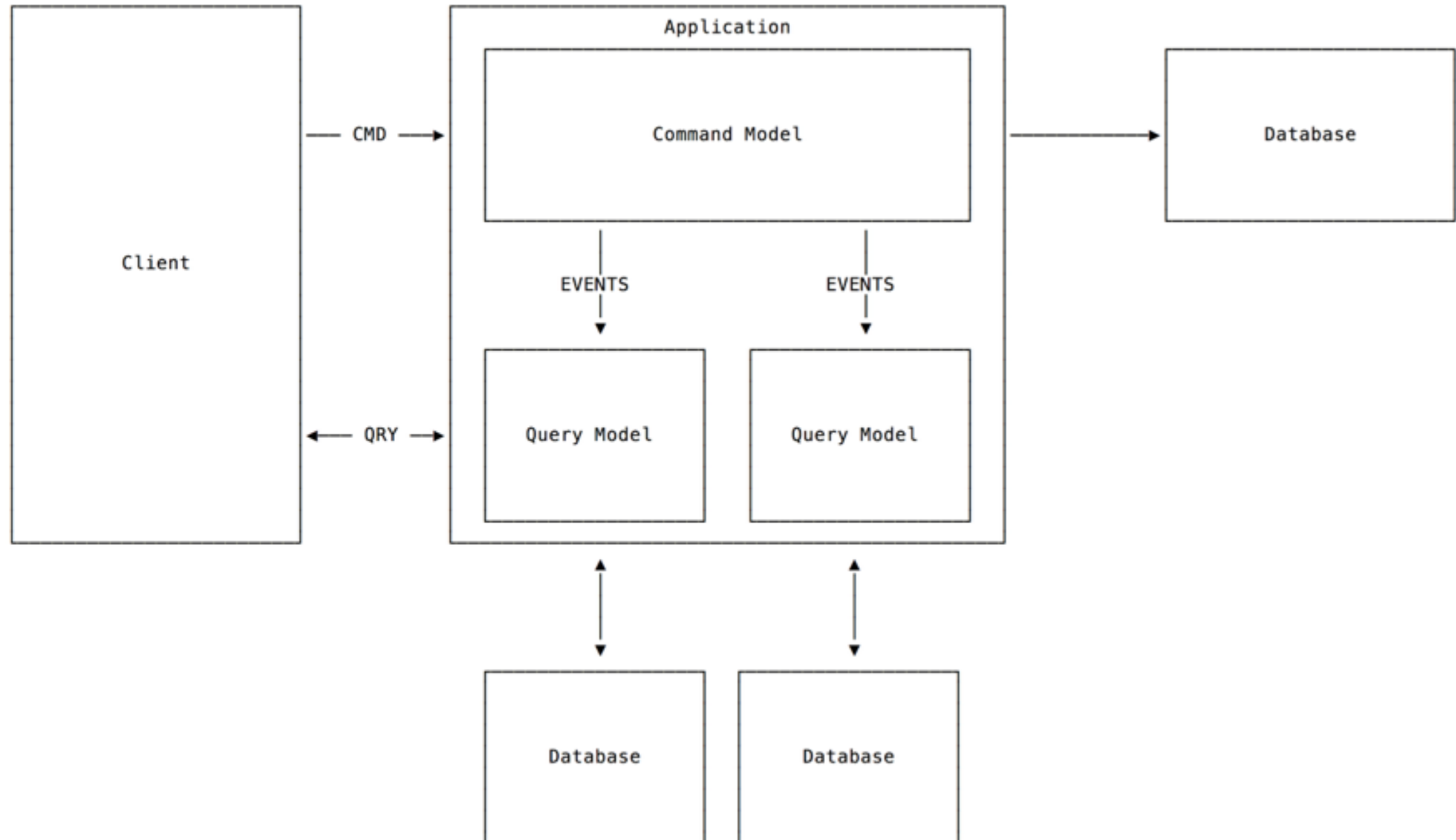
Terms

Event - Describes something that has occurred in the application.

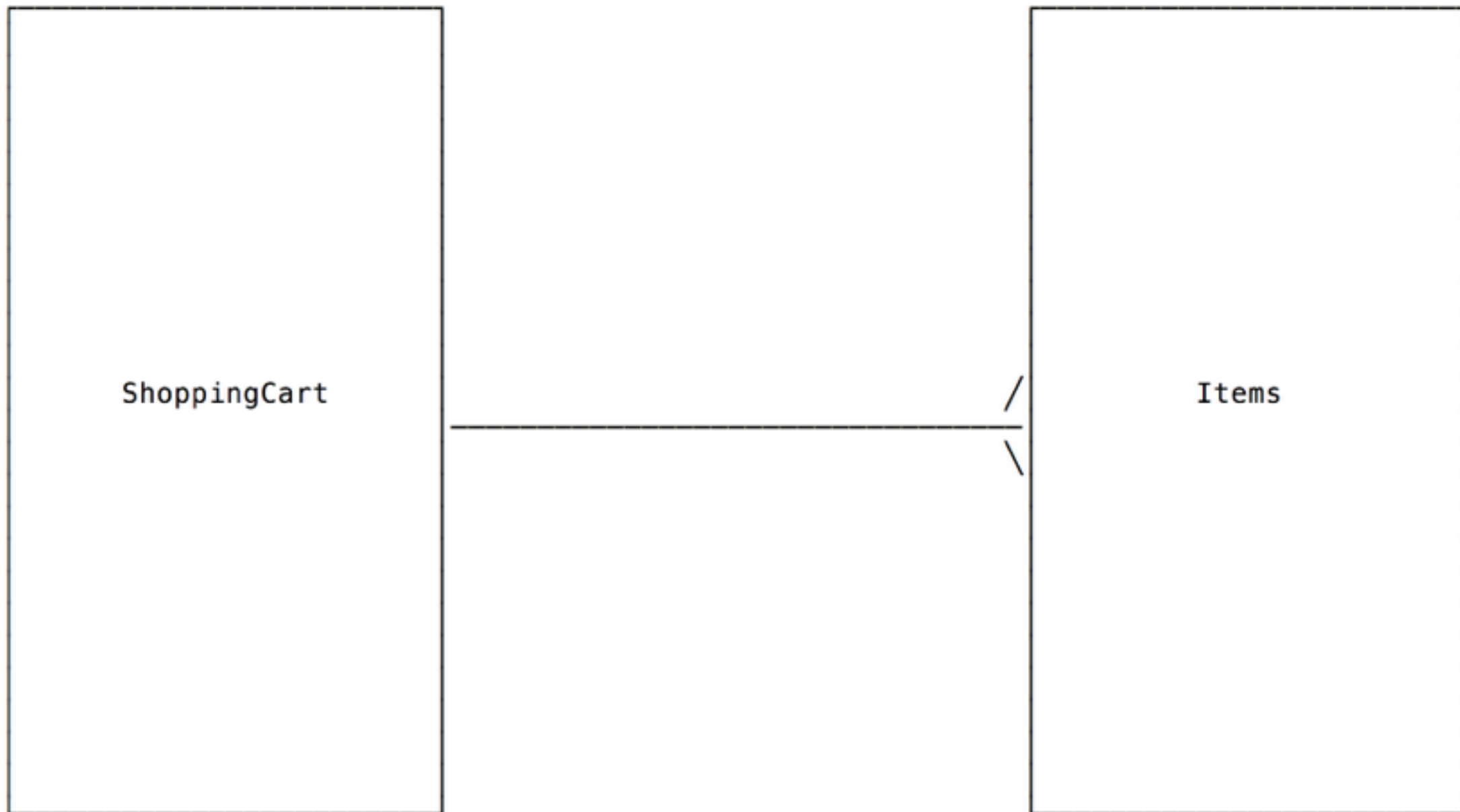
Events loosely couple all components in your application together.

Examples: UserLoggedIn, ItemAddedToCart, or MachineStarted.

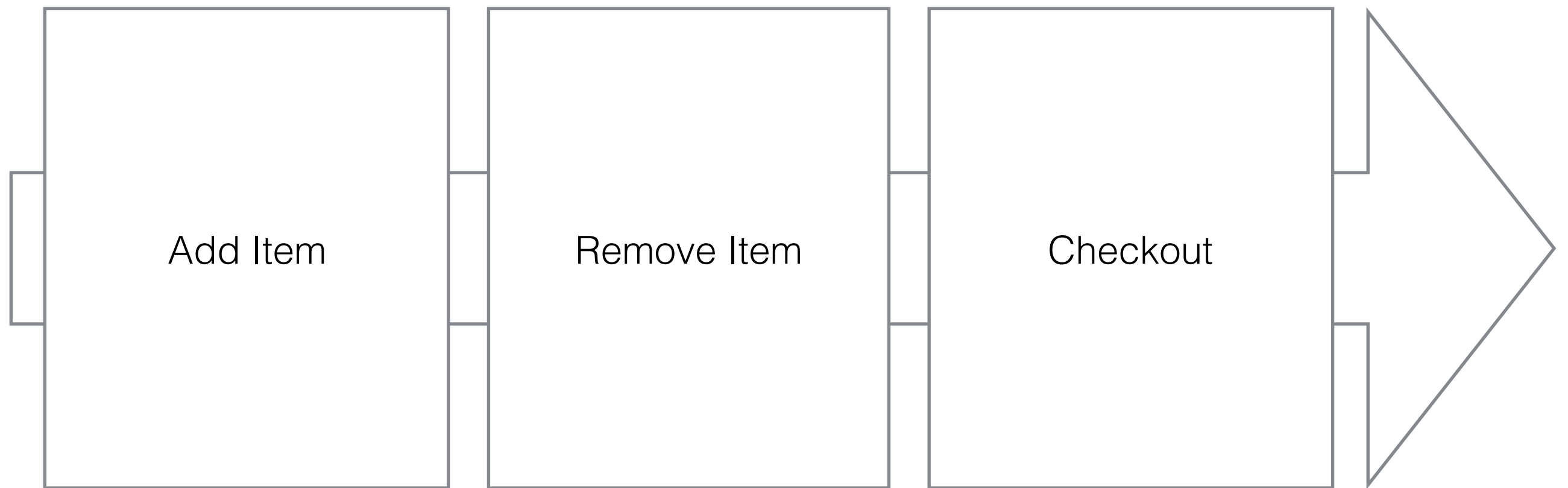
Architecture & Terms



Event Sourcing



Event Sourcing



Event Sourcing

```
2015-nextbuild-cqrs-from-the-trenches — less — 100x60
* commit c2590482adf0f5db9f49b690ab4974a4217b90d7
Author: MMz <mmz.source@gmail.com>
Date:   Wed May 27 22:14:10 2015 +0200

    Small changes to presentation text

* commit 029377019096873e751eef337b7d68f75ca819c2
Author: Dennis Laumen <dennis.laumen@ihomer.nl>
Date:   Wed May 27 21:51:16 2015 +0200

    Add first version of Event Sourcing

* commit 742bb74f4798d4002a9aa00d6829ec819941addf
Author: MMz <mmz.source@gmail.com>
Date:   Wed May 27 19:39:03 2015 +0200

    First State pictures

* commit 3e90f39b734eebdb868423d8bf90c8e6bcc5cec3
Author: MMz <mmz.source@gmail.com>
Date:   Wed May 27 15:50:18 2015 +0200

    Small changes

* commit 1092cf14845689d94ae3ed8e1c8beedc896bf62
Author: MMz <mmz.source@gmail.com>
Date:   Wed May 27 15:03:11 2015 +0200

    Changed sheets, added pictures, added presentation text (will probably land in the speaker notes eventually.)

* commit 10ee713bf1bad9f7abfb3562775fedd6b79a7a1
Author: MMz <mmz.source@gmail.com>
Date:   Tue May 26 11:13:38 2015 +0200

    Generated TOC (with doctoc)

* commit 92070d7b39ad3707bfc80b79636a9bb975407197
Author: MMz <mmz.source@gmail.com>
Date:   Tue May 26 11:11:58 2015 +0200

    Renamed document

* commit 93e150bddbf890c9af1bacfabd396684702c6327
Author: Dennis Laumen <dennis.laumen@ihomer.nl>
Date:   Tue May 26 10:34:21 2015 +0200

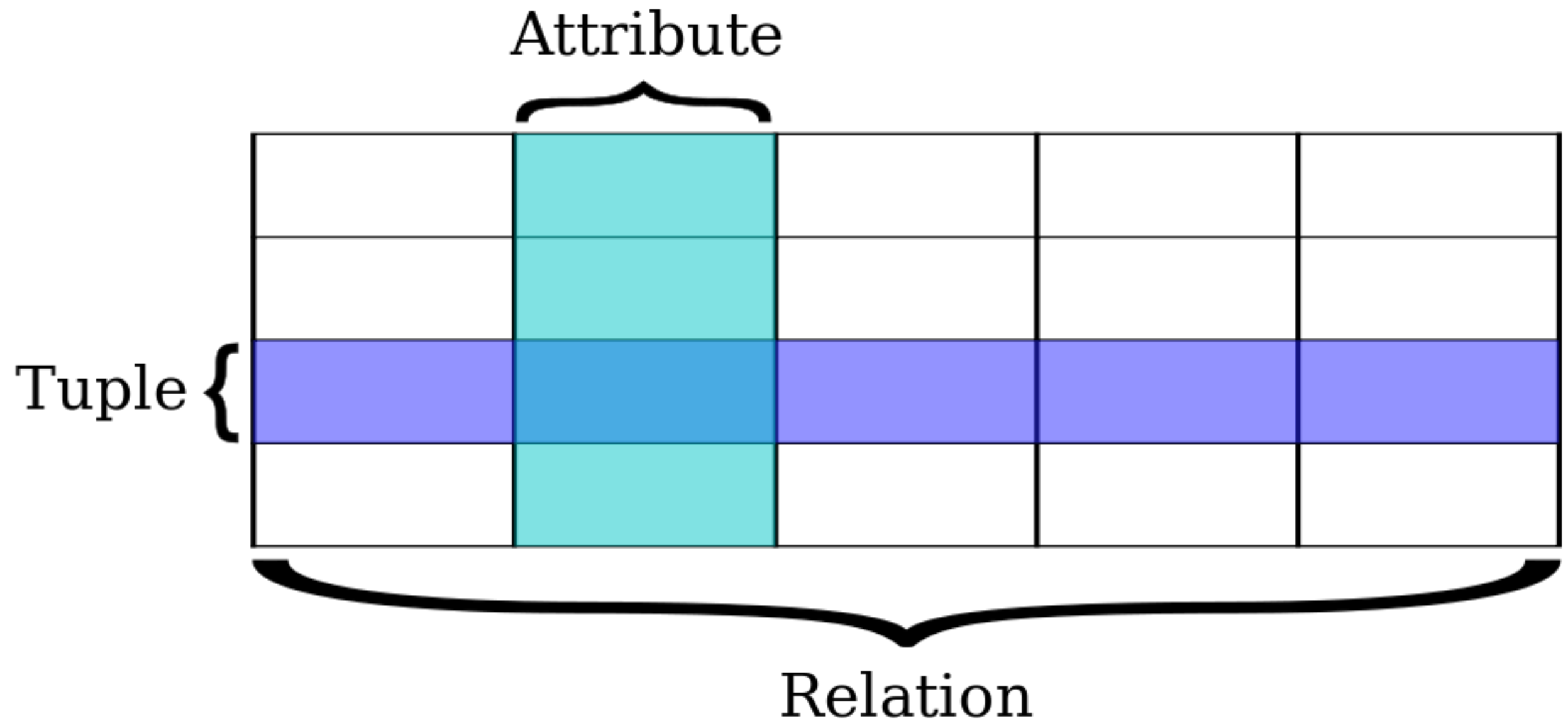
    Change Reads/Writes based on feedback

* commit 8852b889efe4d50e703be26781a540cd33407efc
Author: MMz <mmz.source@gmail.com>
Date:   Mon May 25 21:31:30 2015 +0200

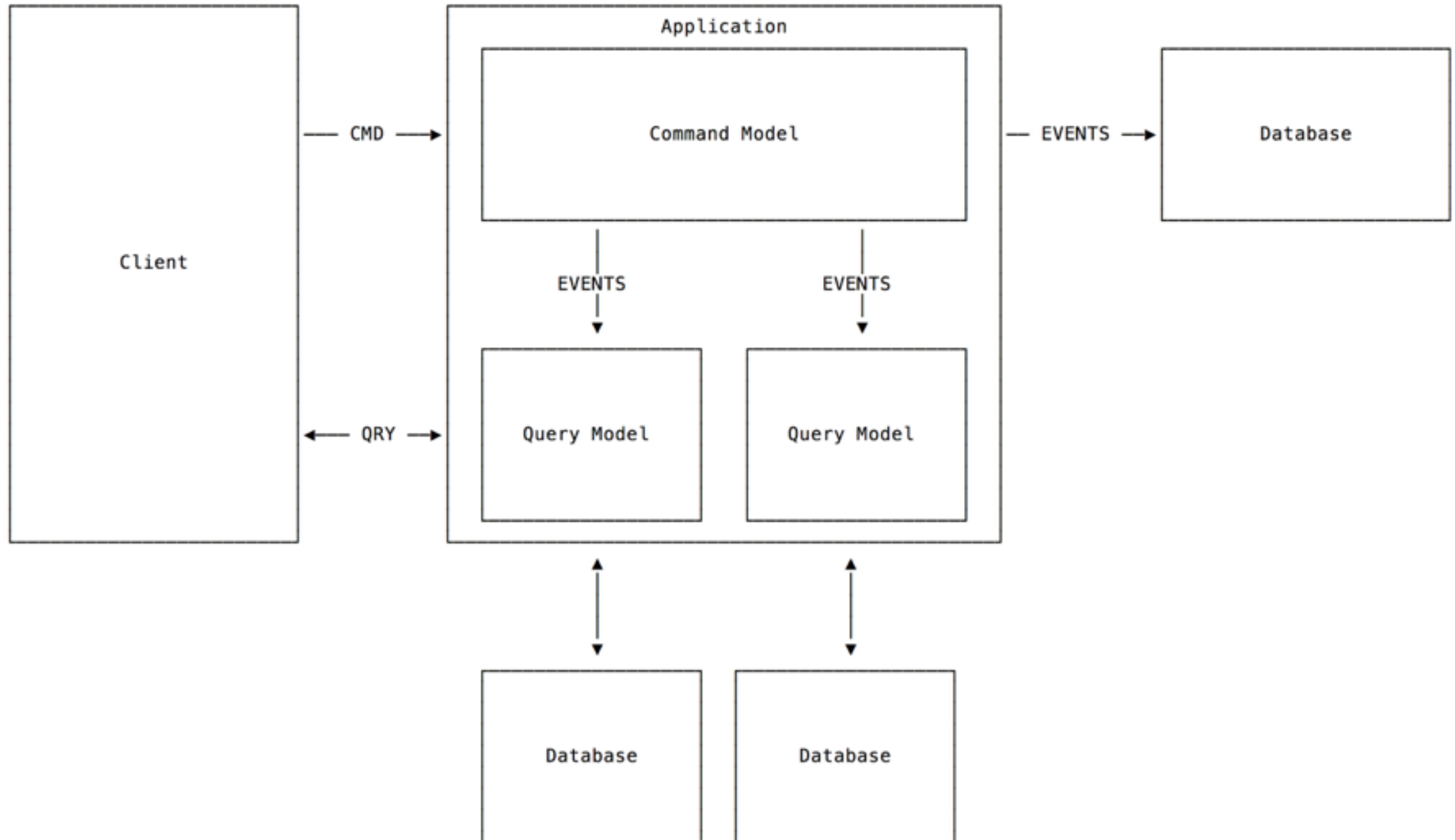
    Added 2 MSDN links

* commit a445db75a9010fd444e14172965ec8919eef7b59
Author: Dennis Laumen <dennis@lau.mn>
Date:   Mon May 25 17:58:04 2015 +0200
```

Event Sourcing

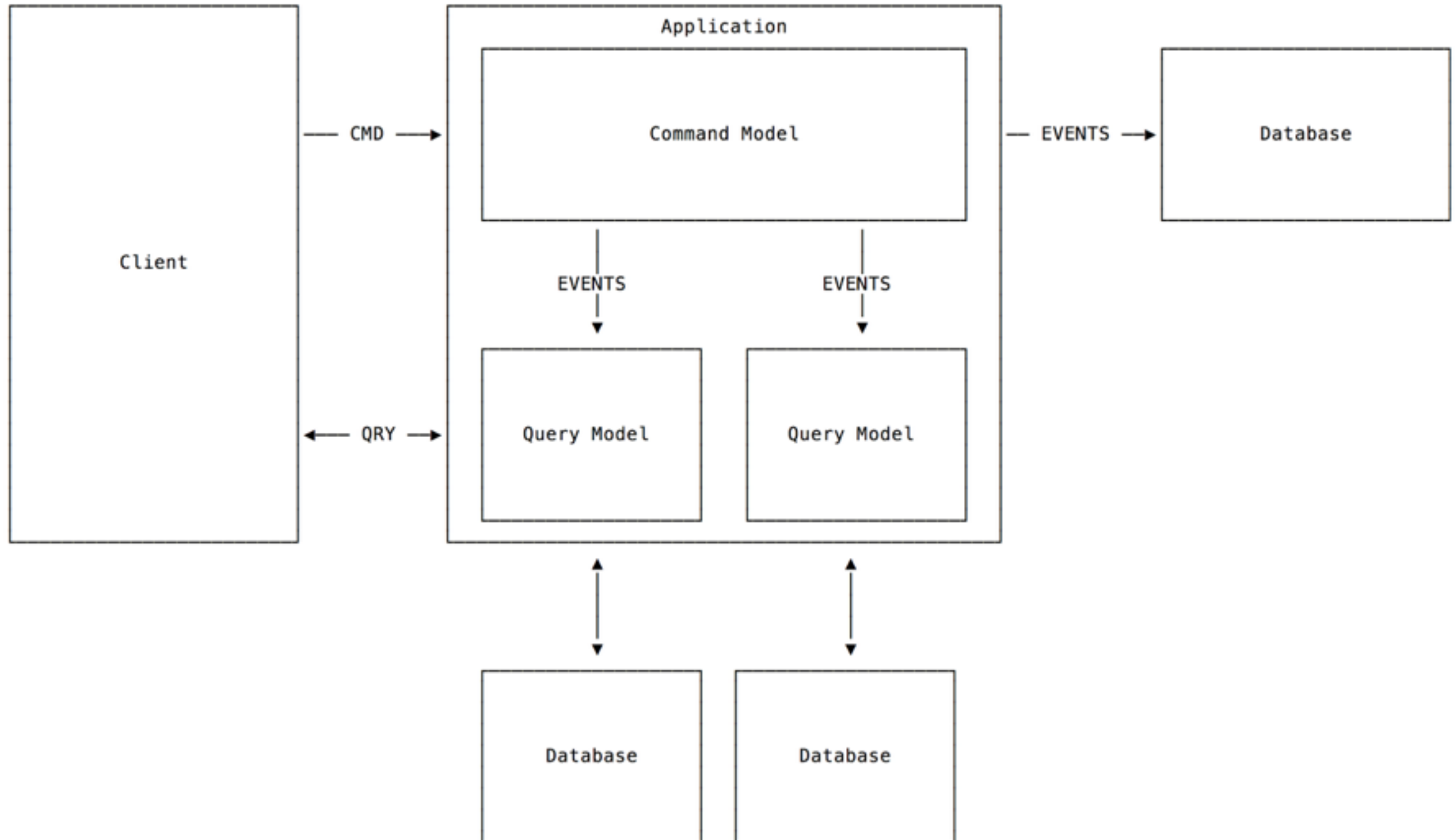


Event Sourcing



Demo

Event Sourcing



from the trenches



Feedback



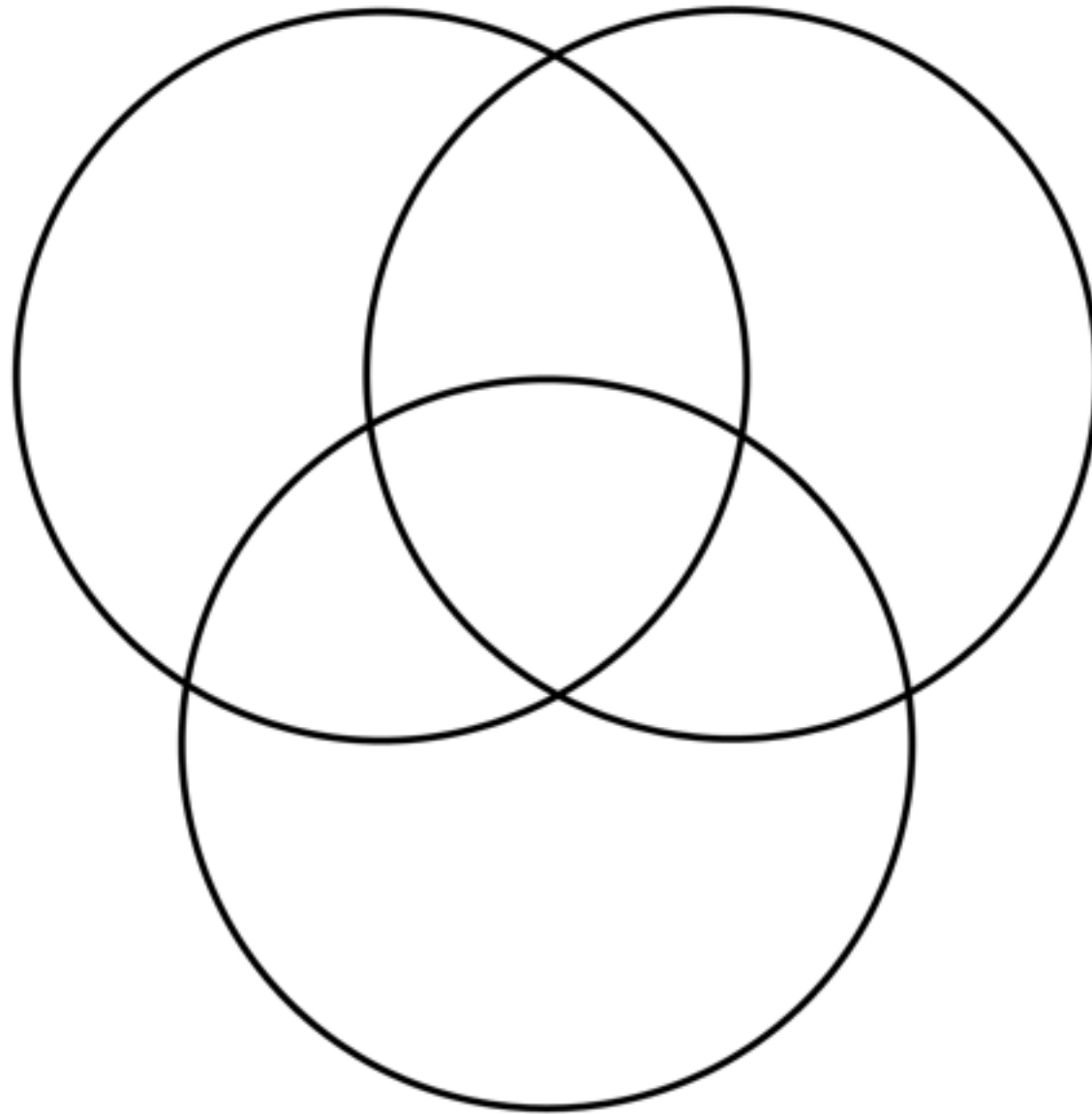
REST mismatch



UI consequences



Set Validation



Duplication



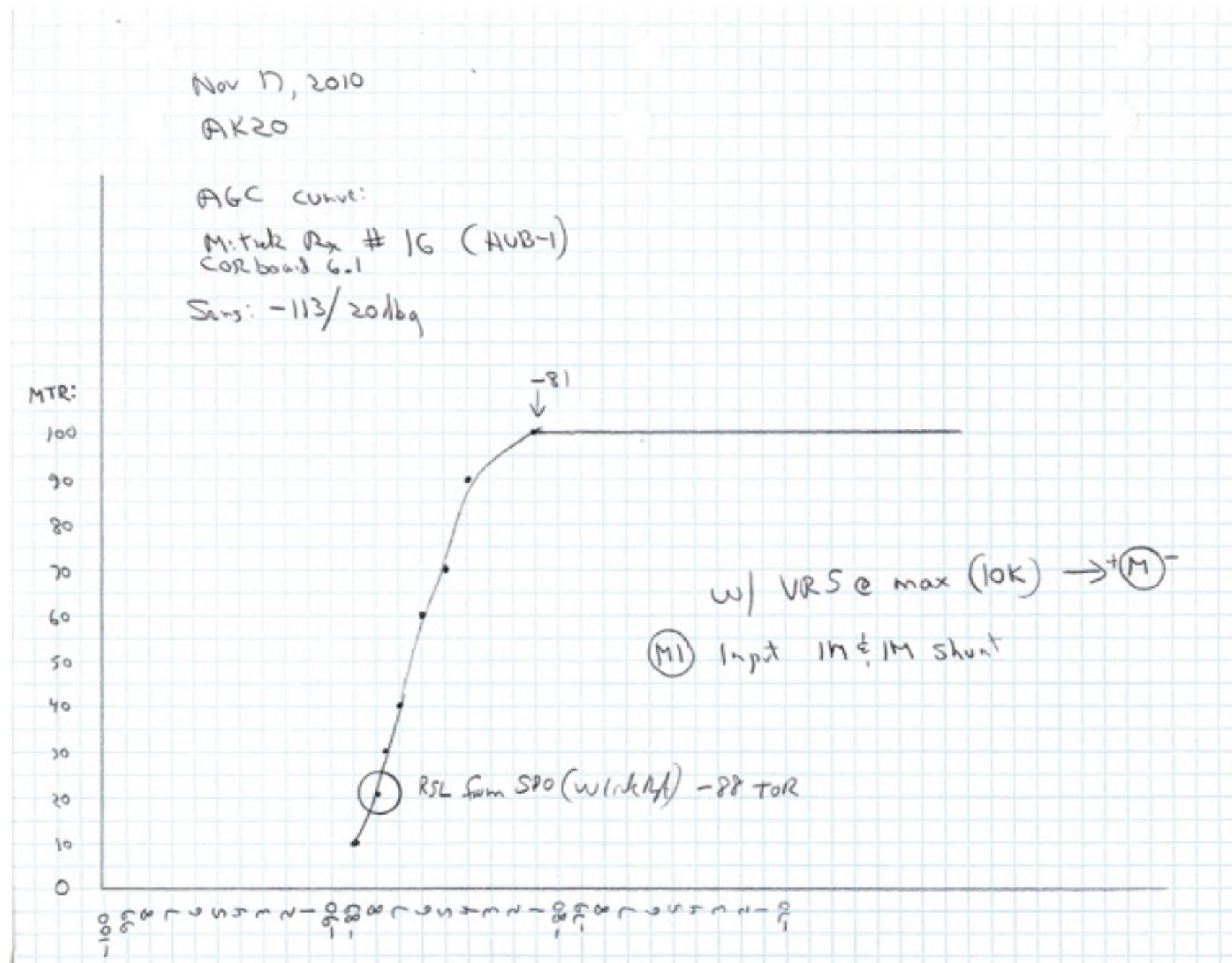
Iterative Dev & Maintenance



Event sourcing and deletion



Learning Curve



CQRS = like an Onion!



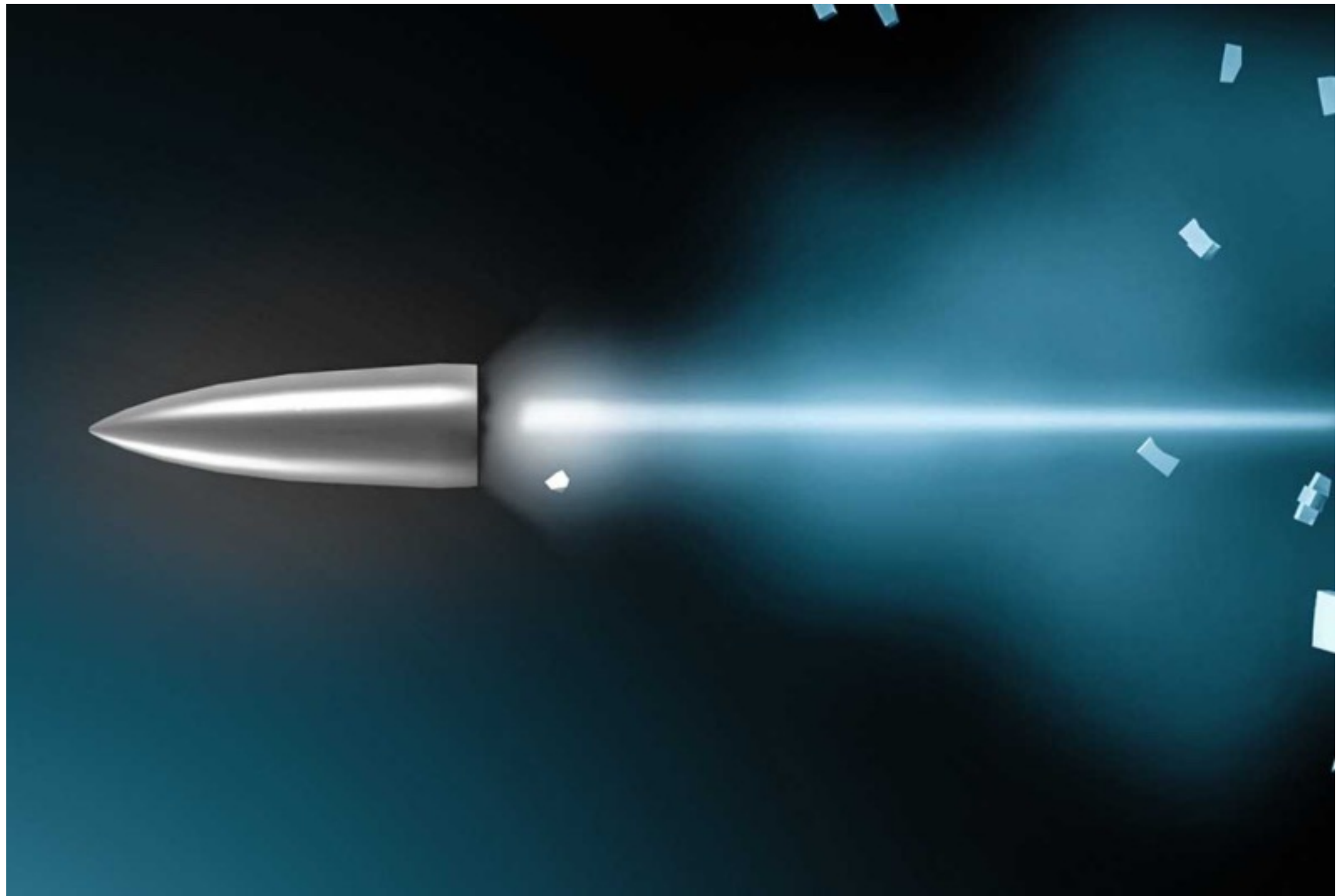
When should you use it?

- Application is likely to be extended with new functionality over a long period of time
- Application has a high read-to-write ratio
- Application presents data in many different formats
- Application has clearly separated components with different audiences

When not to use it?

“The answer is most of the time.” - Udi Dahan

Take away



CQRS links

- CQRS starters kit - <http://cQRS.nu/>
- Udi Dahan - Clarified CQRS - <http://www.udidahan.com/2009/12/09/clarified-cQRS/>
- Udi Dahan - When to avoid CQRS - <http://www.udidahan.com/2011/04/22/when-to-avoid-cQRS/>
- Udi Dahan - Race Conditions don't exist - <http://www.udidahan.com/2010/08/31/race-conditions-dont-exist/>
- Udi Dahan - Don't create aggregate roots - <http://www.udidahan.com/2009/06/29/dont-create-aggregate-roots/>
- Rob Ashton - CQRS is too complicated - <http://codeofrob.com/entries/cQRS-is-too-complicated.html>
- Greg Young - CQRS, Task Based UIs, Event Sourcing agh! - <http://codebetter.com/gregyoung/2010/02/16/cQRS-task-based-uis-event-sourcing-agh/>
- Greg Young - CQRS Document - http://cQRS.files.wordpress.com/2010/11/cQRS_documents.pdf
- Greg Young - CQRS presentation - <http://www.slideshare.net/Igrosales/greg-youngs-simple-cQRS-sample-15519735>
- Martin Fowler - CQRS - <http://martinfowler.com/bliki/CQRS.html>
- MSDN - CQRS Journey - <http://msdn.microsoft.com/en-us/library/jj554200.aspx>
- Structural Overview of a CQRS application - <https://code.google.com/p/axon-auction-example/wiki/StructuralOverview>

Axon Framework links

- The Axon framework - <http://www.axonframework.org/>
- InfoQ - A discussion with Allard Buijze on CQRS with the Axon framework - http://www.infoq.com/articles/cqrs_with_axon_framework
- Joris Kuipers & Allard Buijze - Scaling in Complex Domains using CQRS, Axon, and Spring Insight - <http://blogs.vmware.com/management/2013/02/scaling-in-complex-domains-using-cqrs-axon-and-spring-insight.html>

Example project links

- Axon-Auction-Example - <https://code.google.com/p/axon-auction-example/wiki/StructuralOverview>
- Axon & Angular (2012) - <http://blog.trifork.com/2012/11/27/basic-axon-framework-sample-using-vert-x-and-angular-js/>
- Axon Framework + Quickstart - <https://github.com/AxonFramework/AxonFramework>
- Axon Trader - <https://github.com/AxonFramework/Axon-trader>
- Axon Addressbook Sample - <https://github.com/AxonFramework/Addressbook-Sample>
- Motown project (IHomer) - Axon - <https://github.com/motown-io/motown>