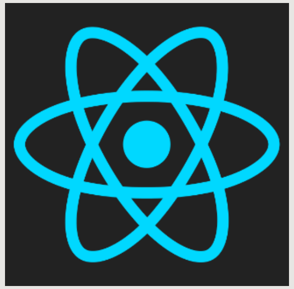
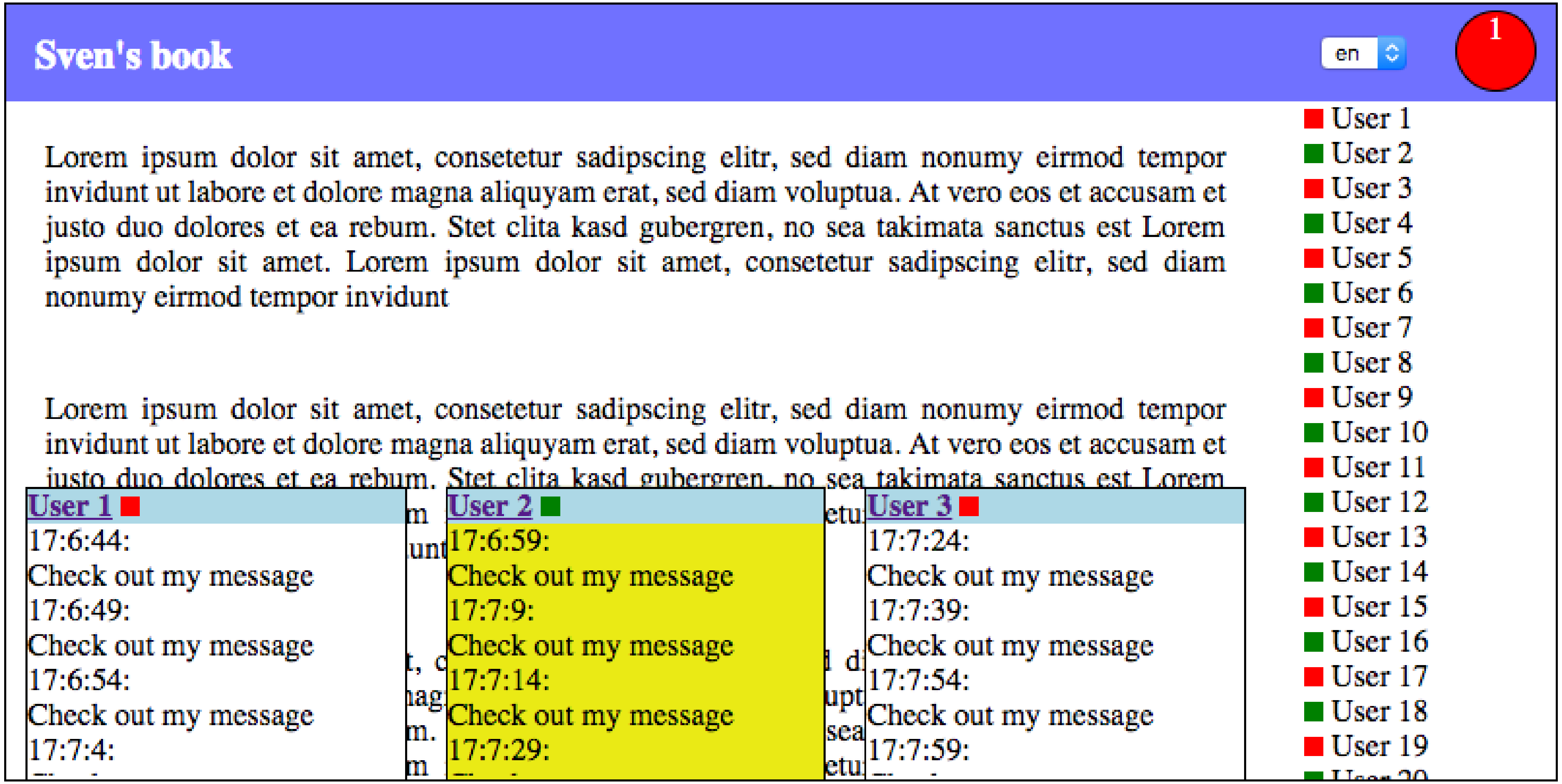
State Management



Sven Kölpin - open knowledge GmbH



Sven's book

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User 1 🟥

17:6:44:
Check out my message
17:6:49:
Check out my message
17:6:54:
Check out my message
17:7:4:

User 2 🟩

17:6:59:
Check out my message
17:7:9:
Check out my message
17:7:14:
Check out my message
17:7:29:

User 3 🟥

17:7:24:
Check out my message
17:7:39:
Check out my message
17:7:54:
Check out my message
17:7:59:

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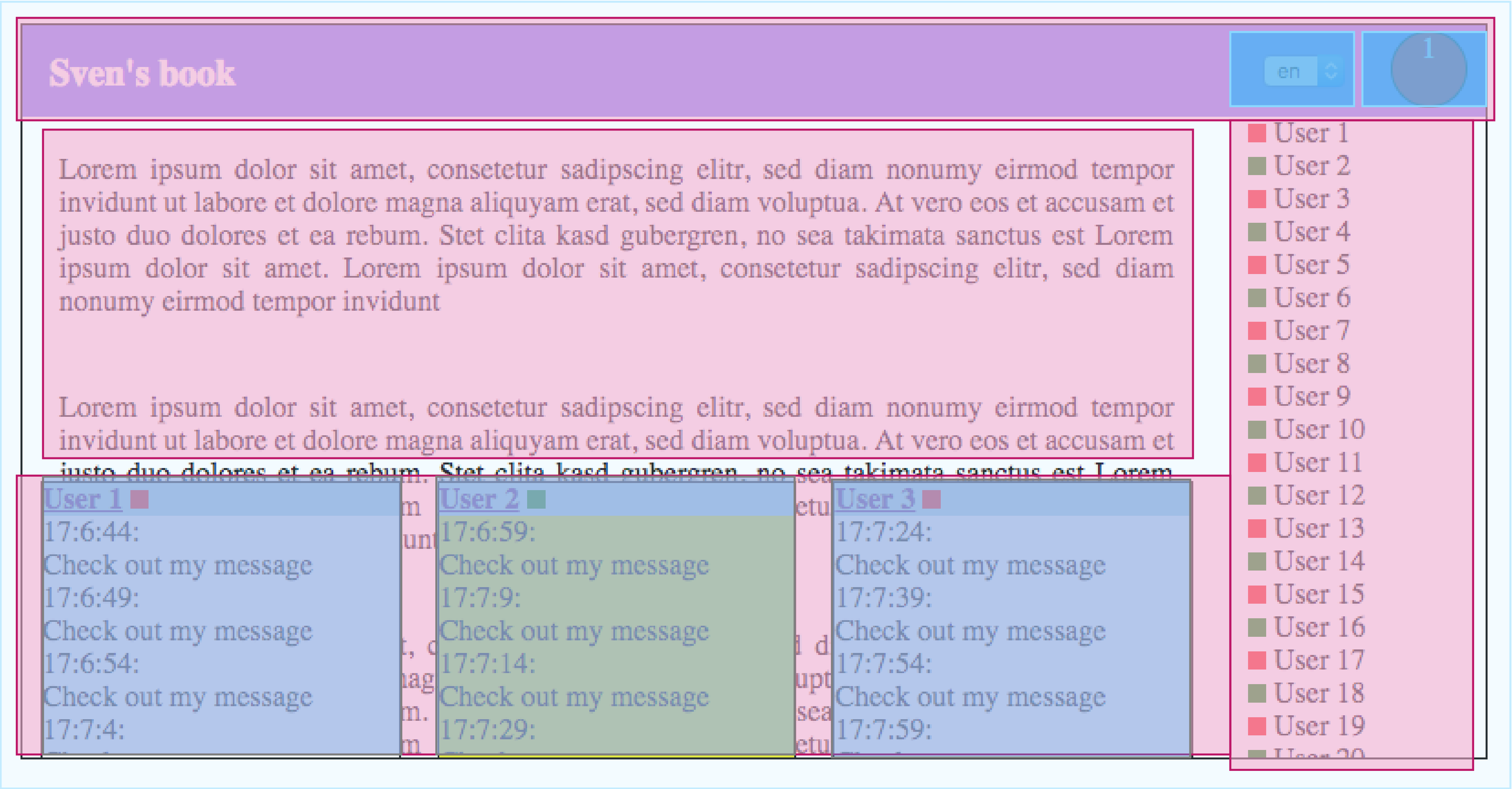

Sven's book

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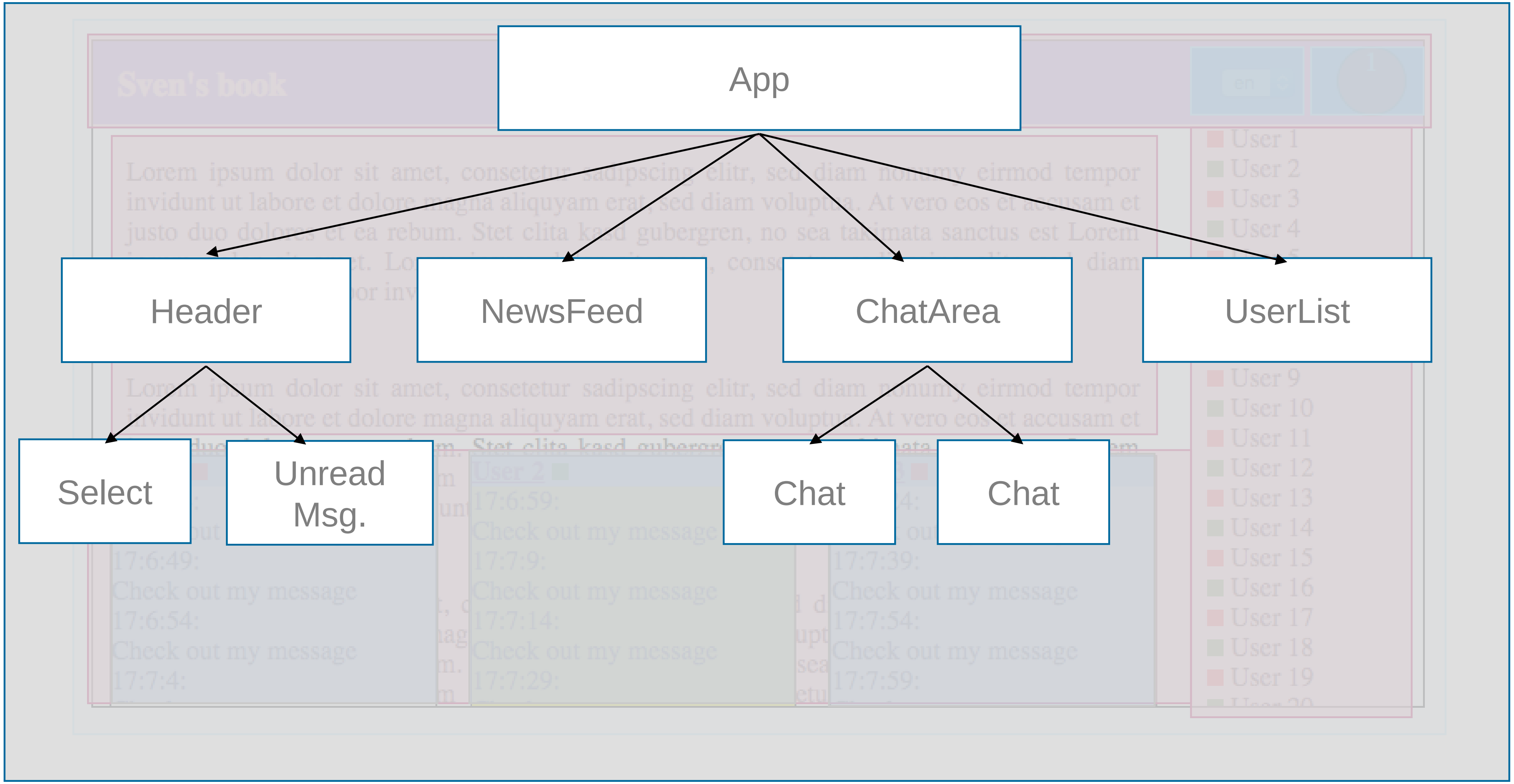


App

Header

NewsFeed

ChatArea

UserList

Select

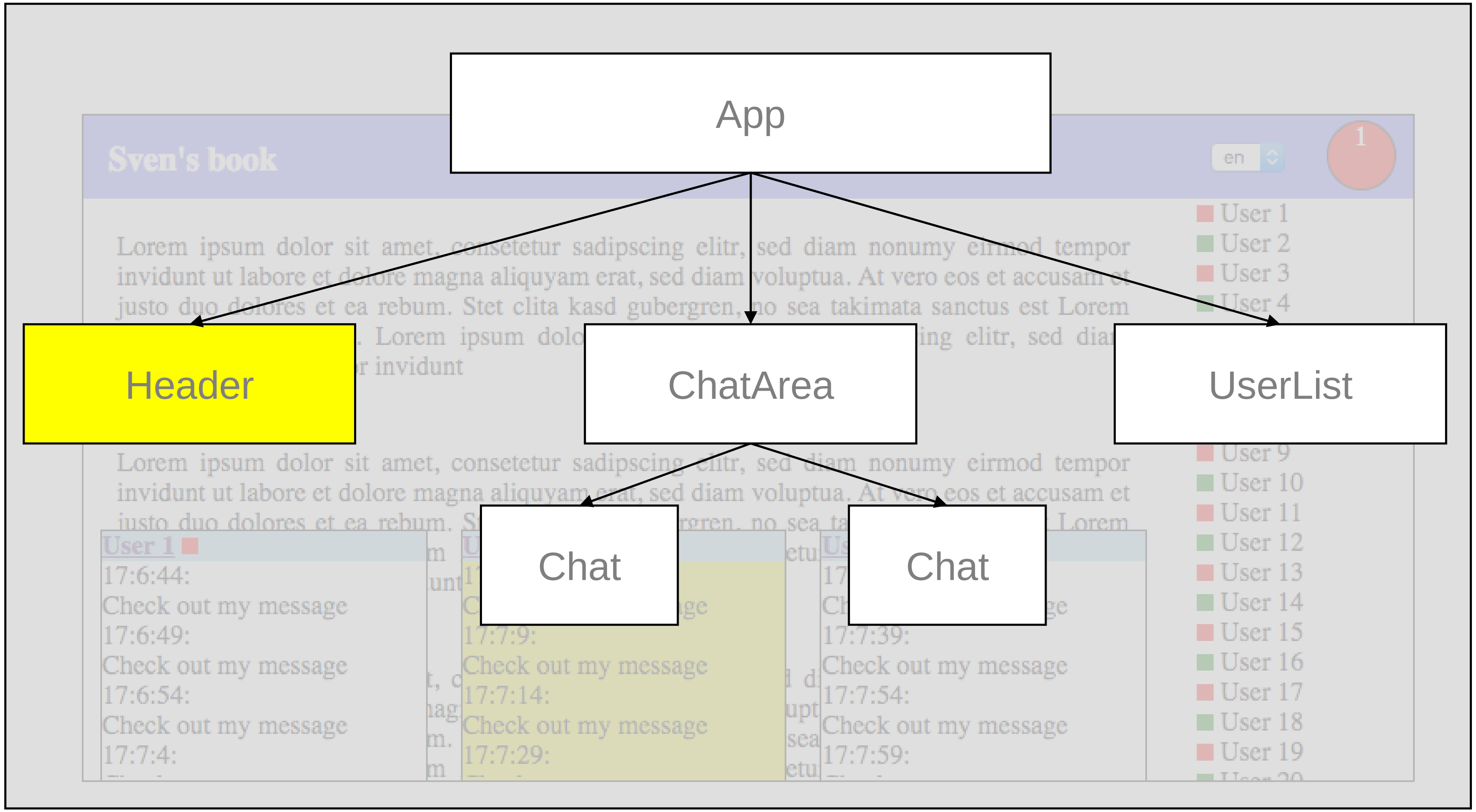
Unread Msg.

Chat

Chat

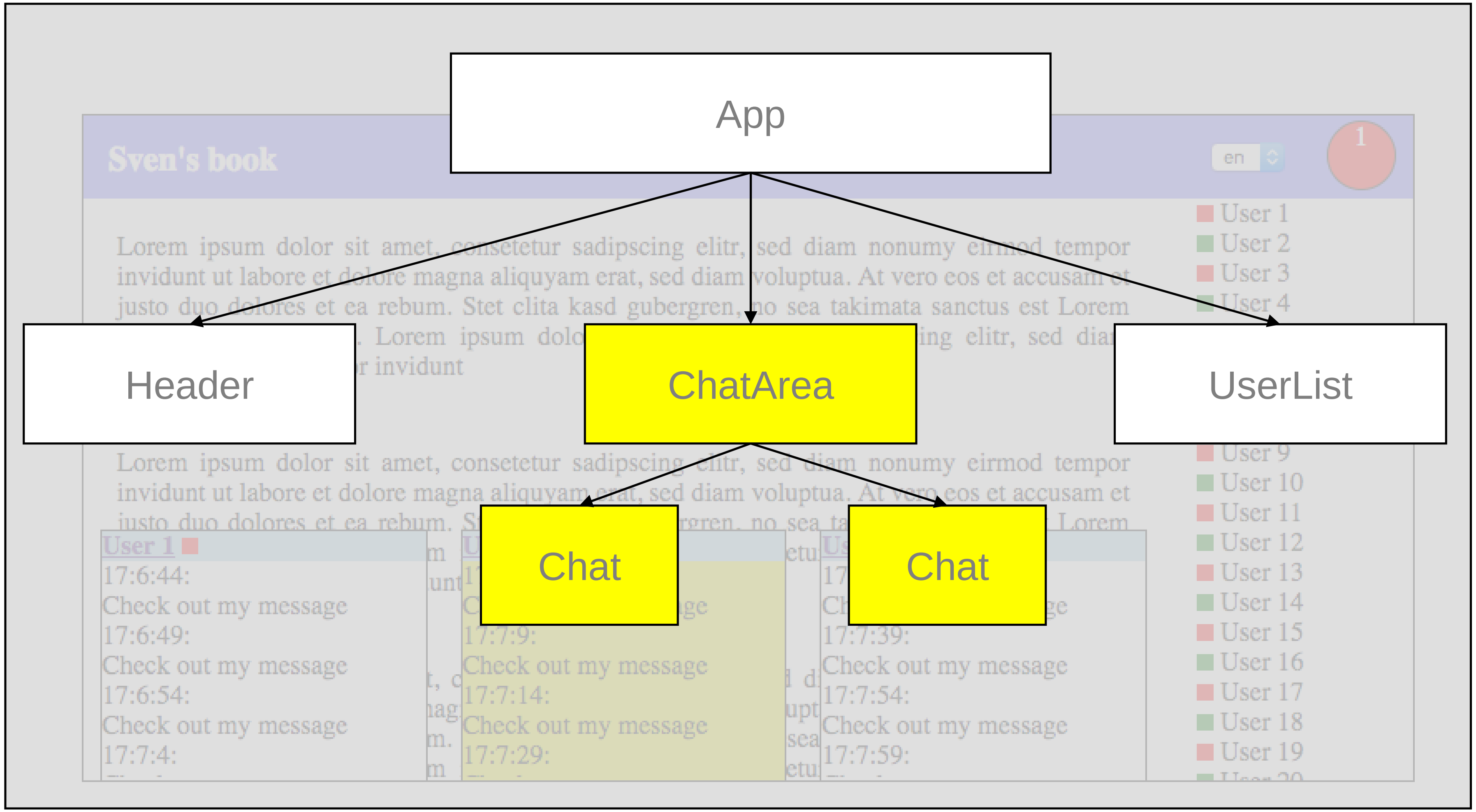
Language

Unread messages



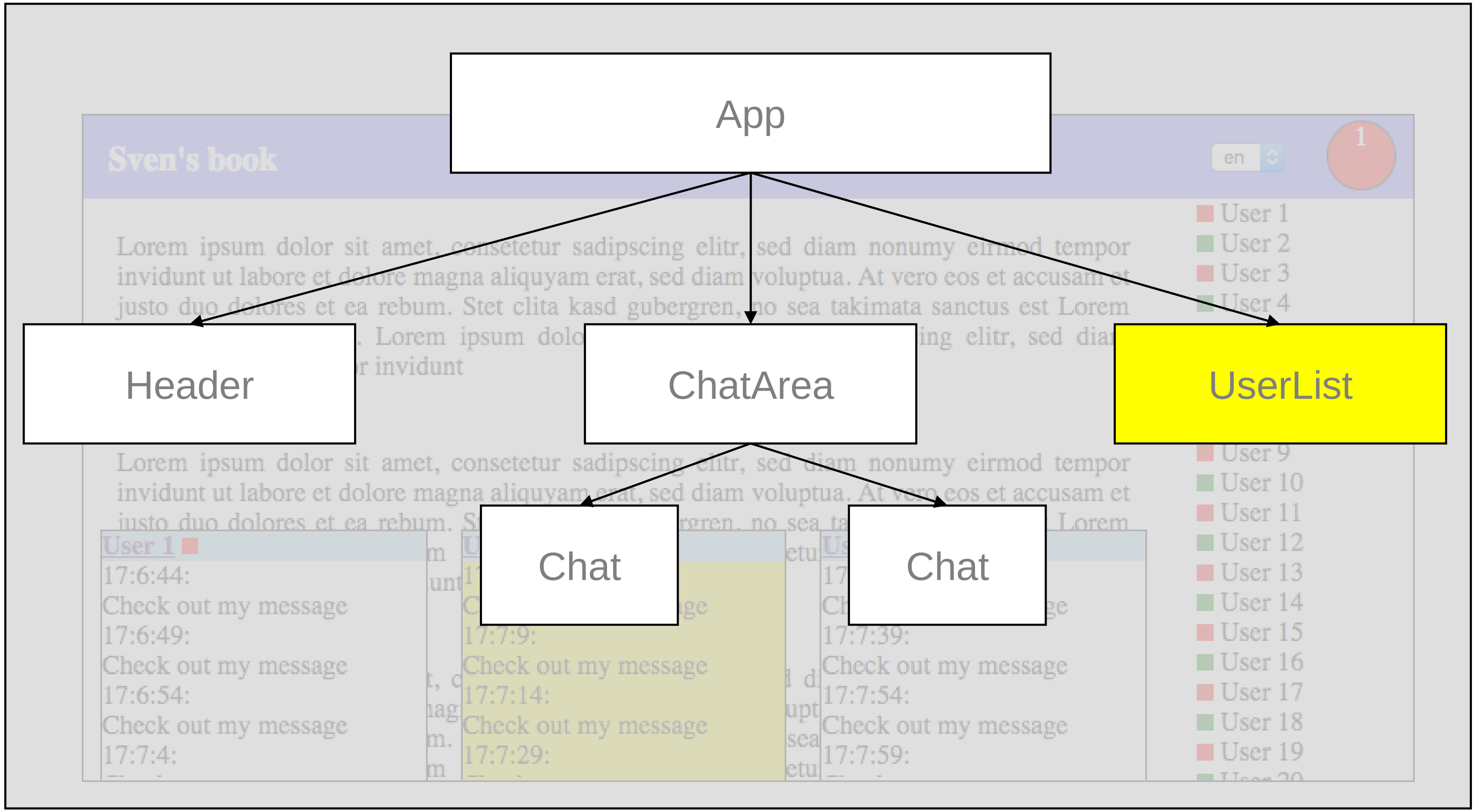
Open Chats
  Messages
  Num. Unread

Friends
  Online / Offline

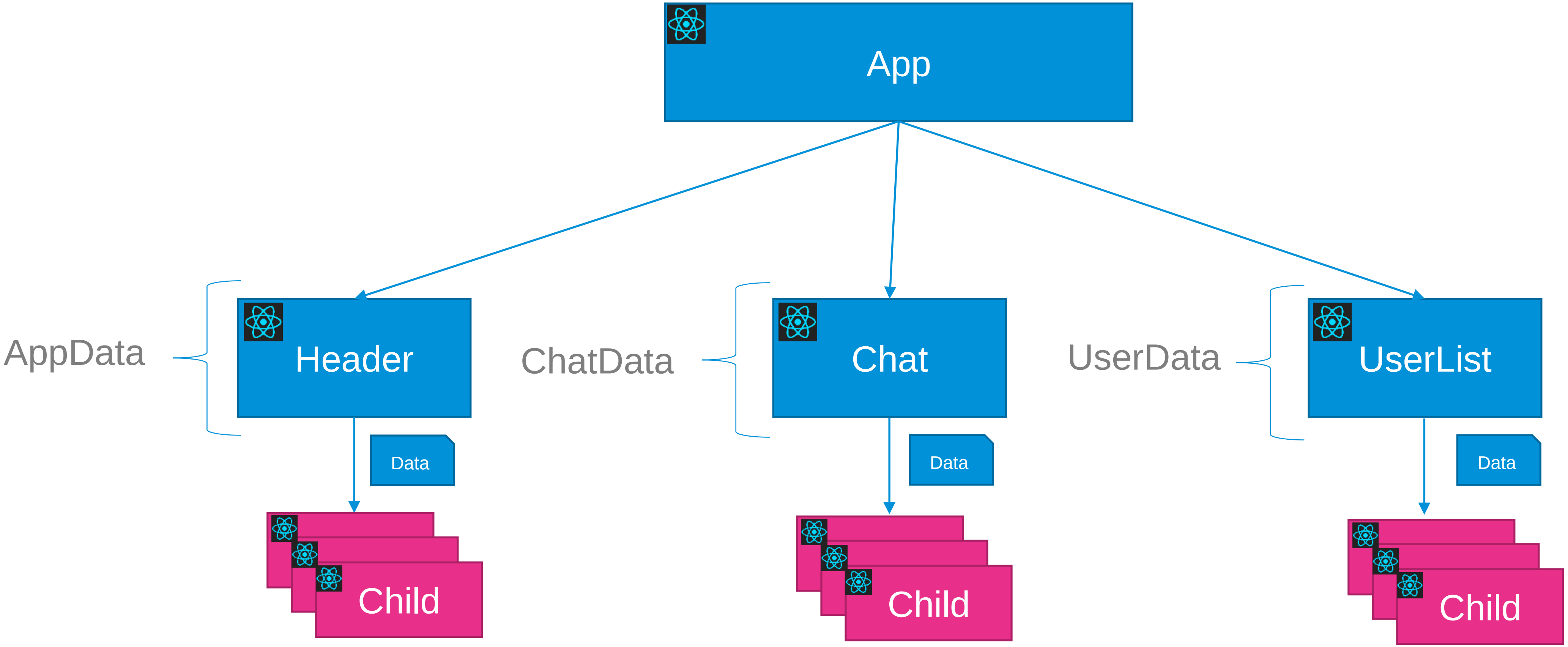


Friends

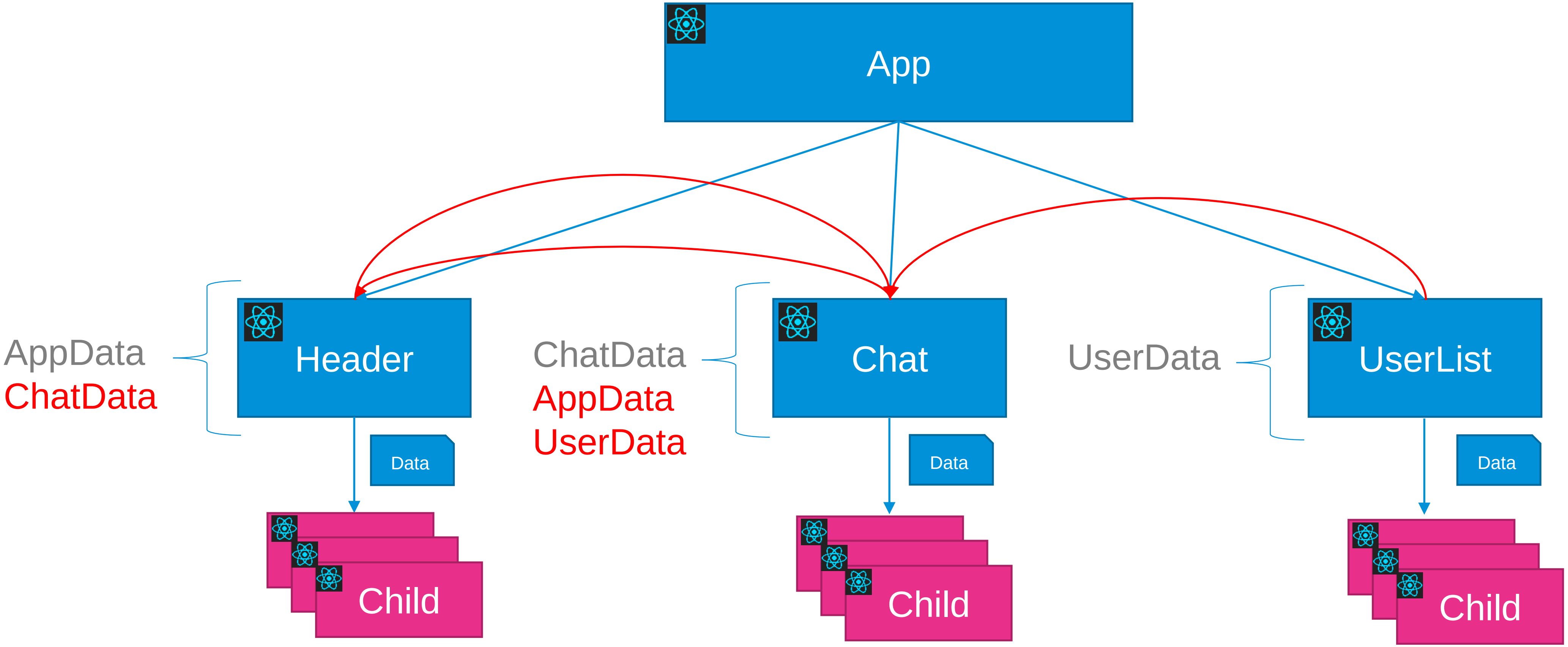
Online / Offline



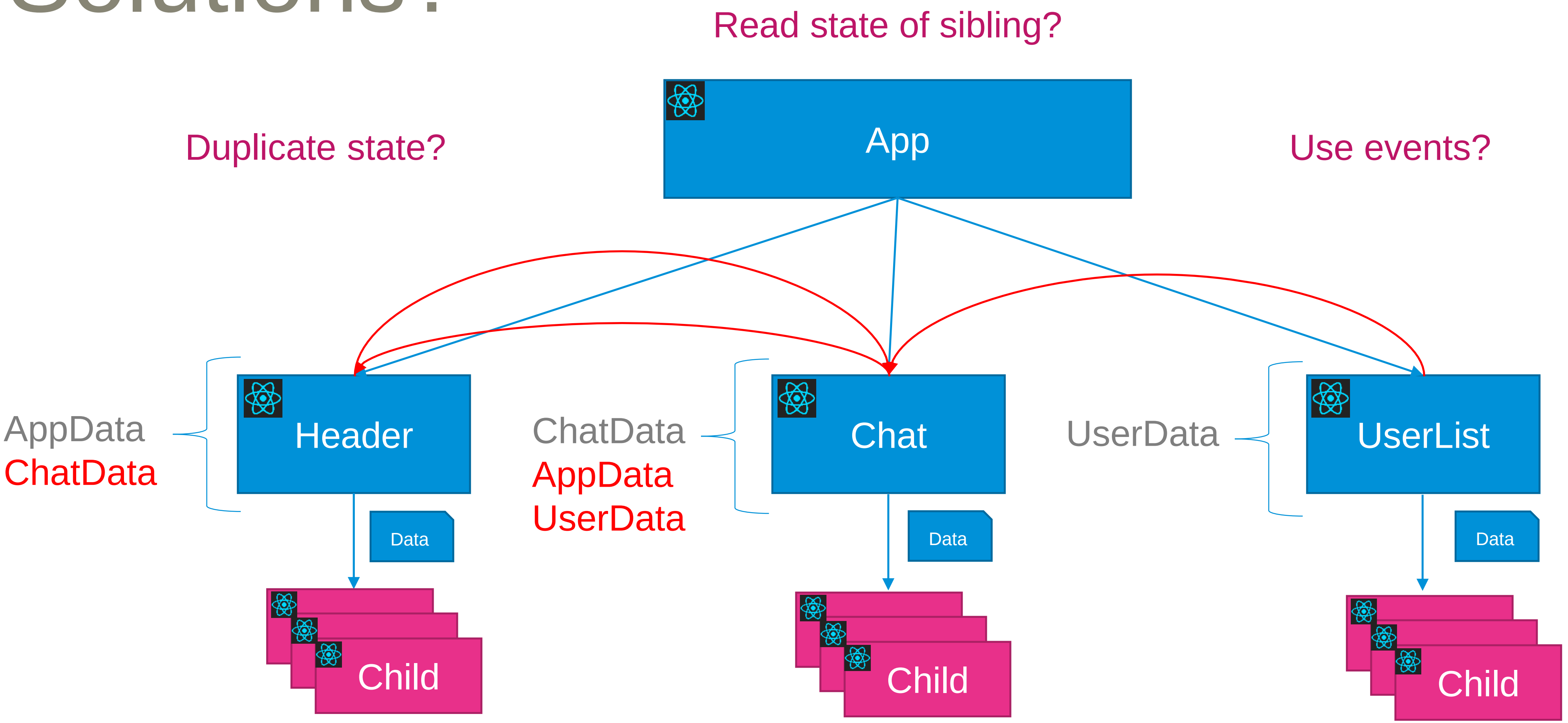
In a perfect world..



In reality...


App
AppData
ChatData
Header
ChatData
AppData
UserData
Chat
UserData
UserList
Data
Data
Data
Child
Child
Child

Solutions?

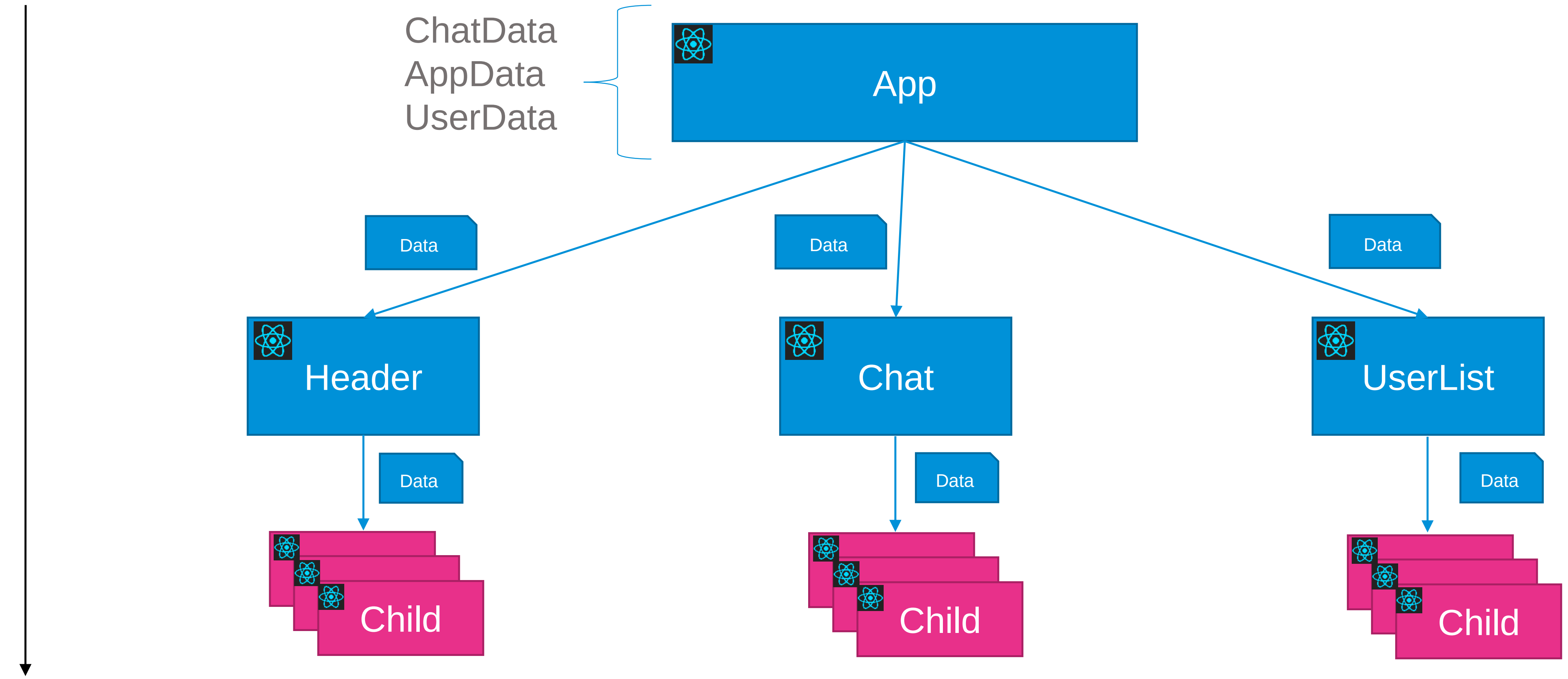


Read state of sibling?

Duplicate state?

Use events?

Data


ChatData
AppData
UserData
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Header
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UserList
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Child
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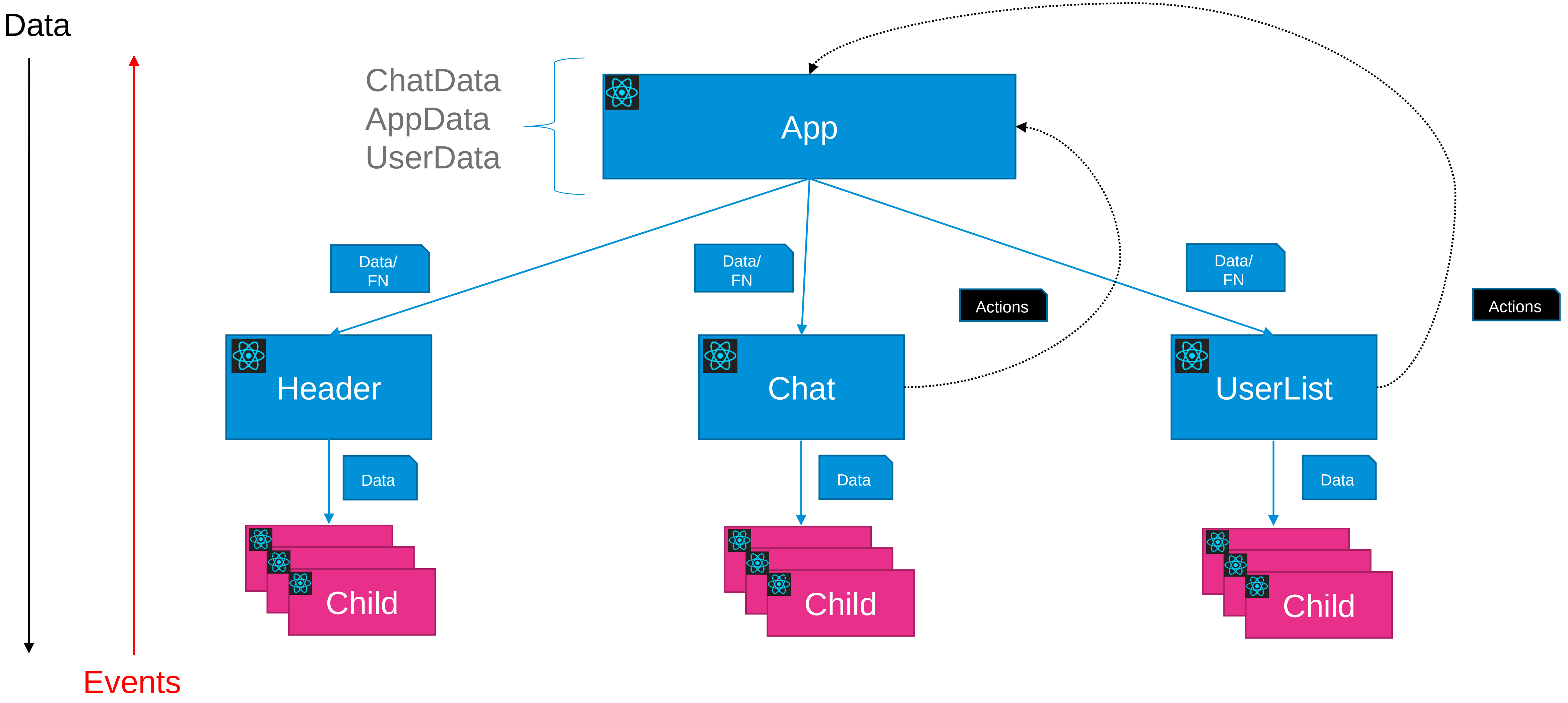
Child



Data

Events

ChatData
AppData
UserData

App

Data/
FN

Header

Data

Child

Data/
FN

Chat

Data

Child

Actions

Data/
FN

UserList

Data

Child

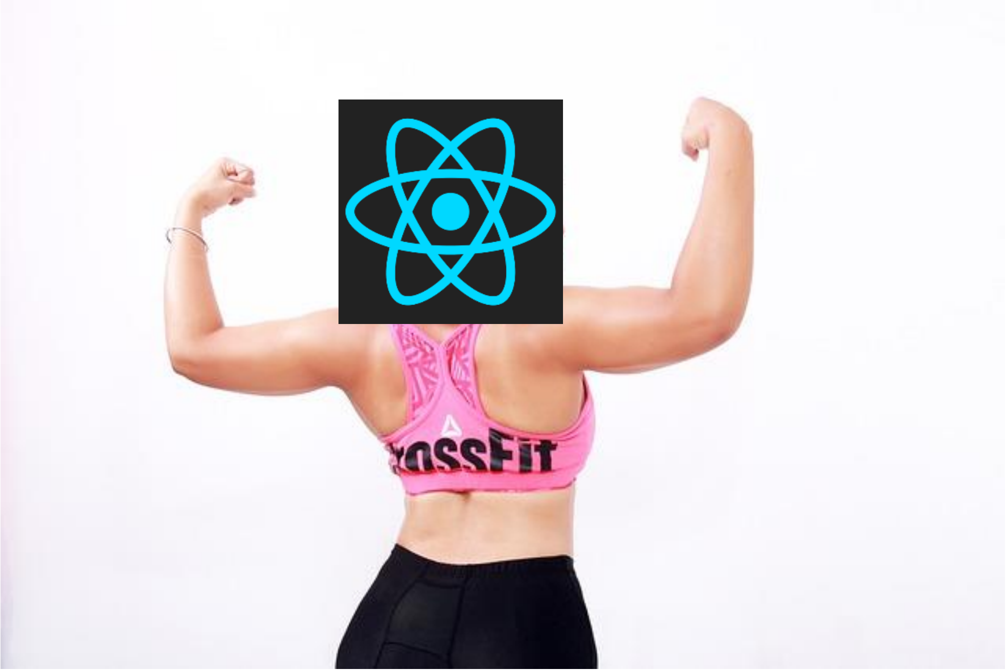
Actions

React State

- **Small** projects

- **Simple** domain models

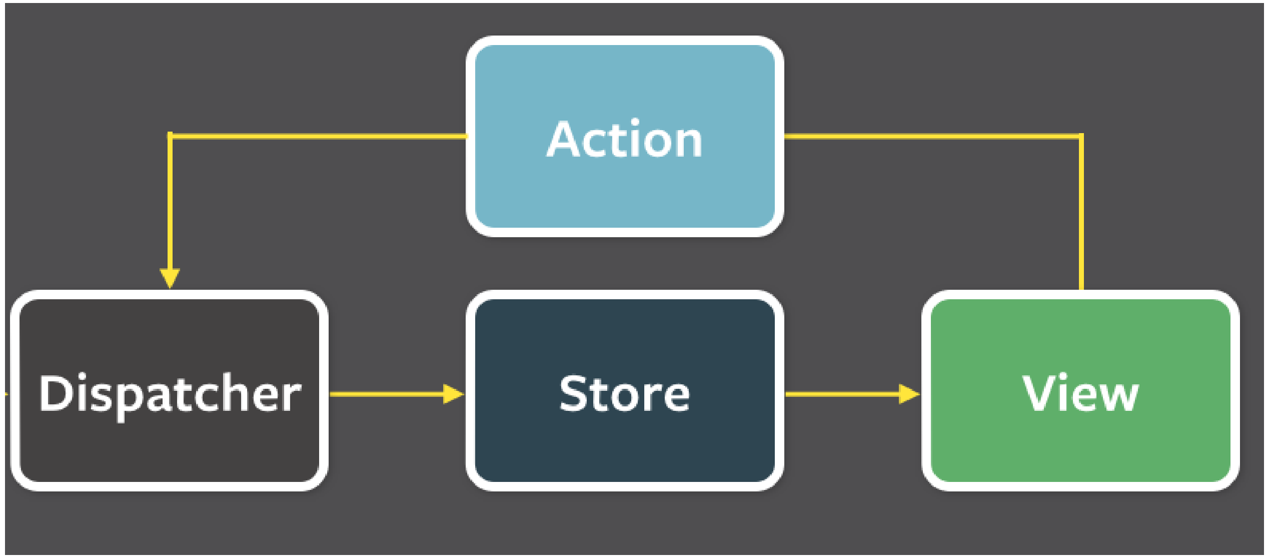
- When projects grow…
  - „**Godlike**“ components
  - Pass data down ☹

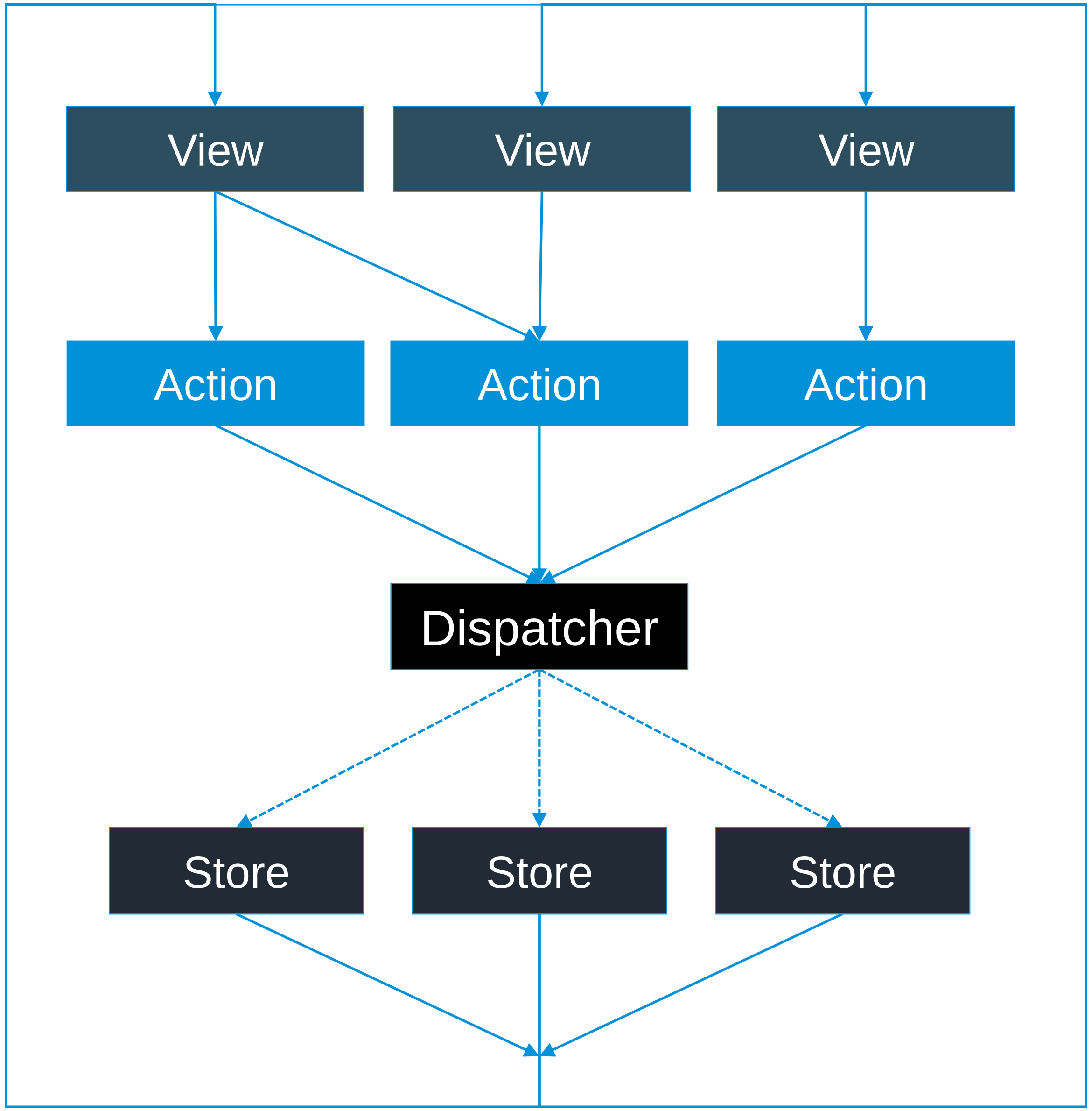


And in bigger projects?

Flux: Micro-architecture

- **Unidirectional** data flow





View

View

View

Action

Action

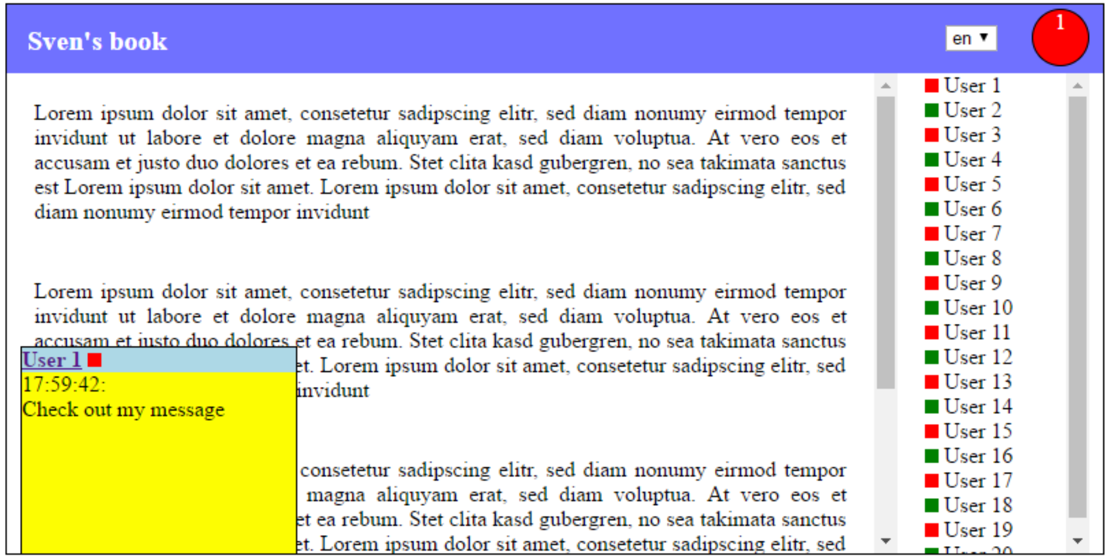
Action

Dispatcher

Store

Store

Store



Sven's book

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User 1 🟥
17:59:42:
Check out my message

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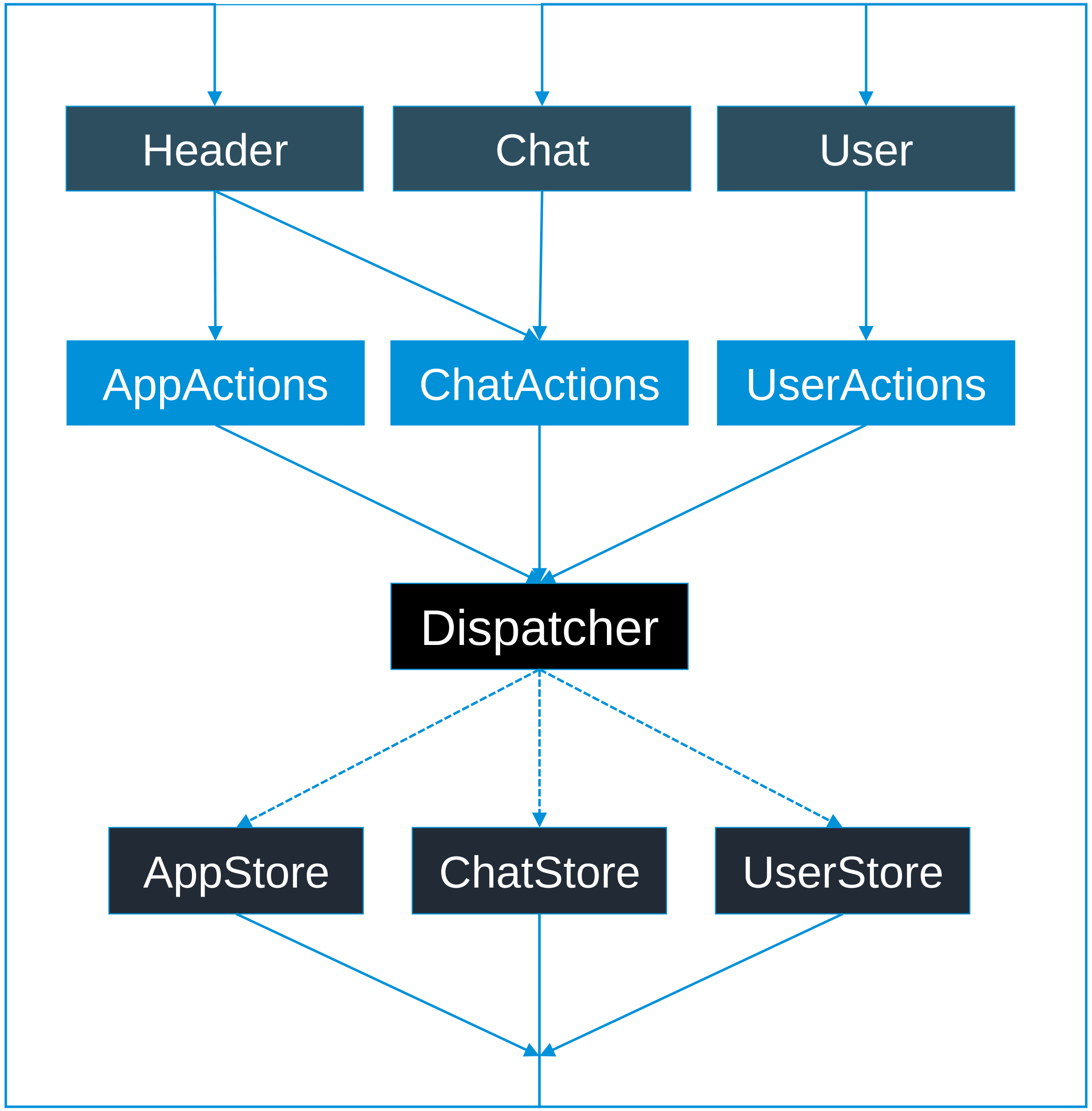

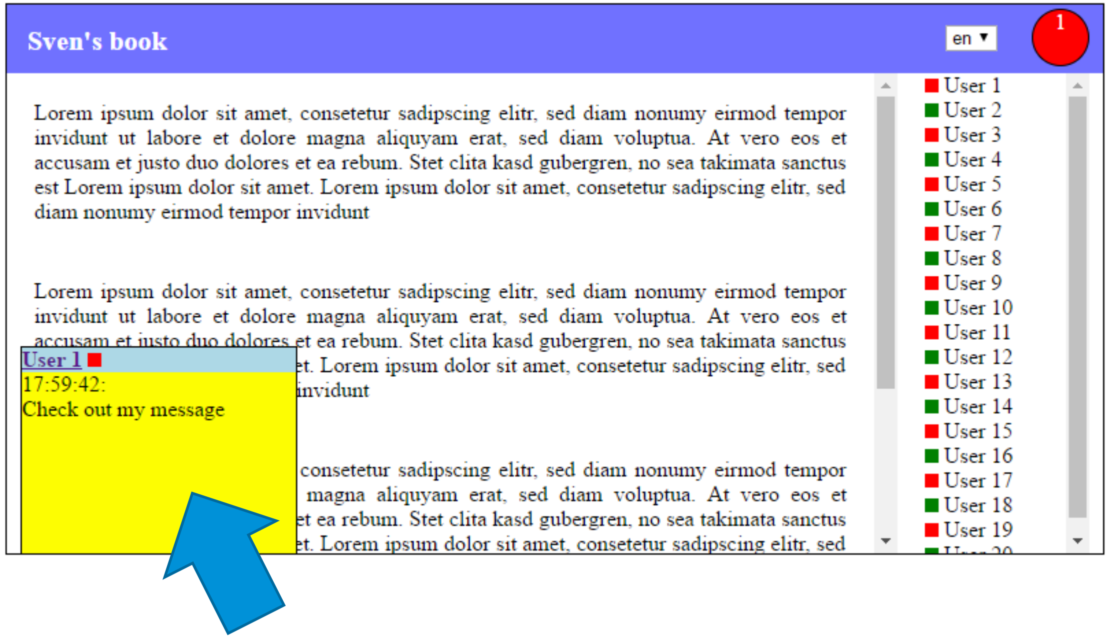

Sven's book

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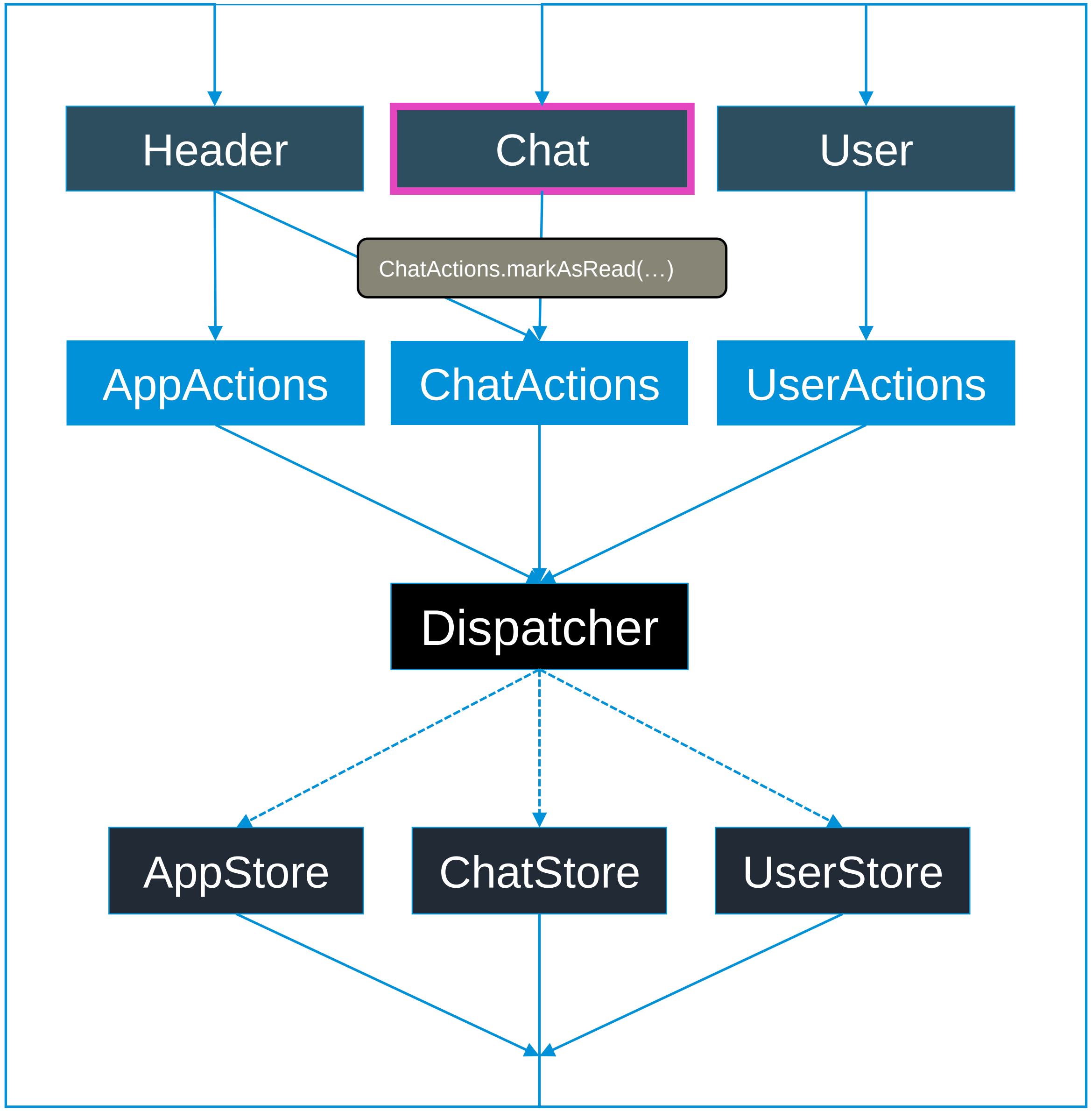
“click”



Header

Chat

User

ChatActions.markAsRead(…)

AppActions

ChatActions

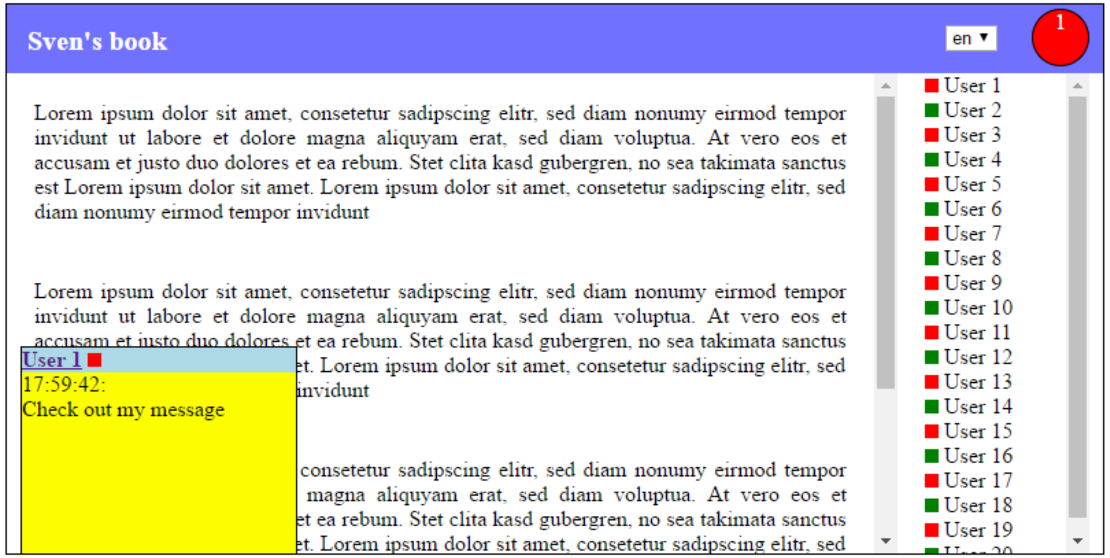
UserActions

Dispatcher

AppStore

ChatStore

UserStore



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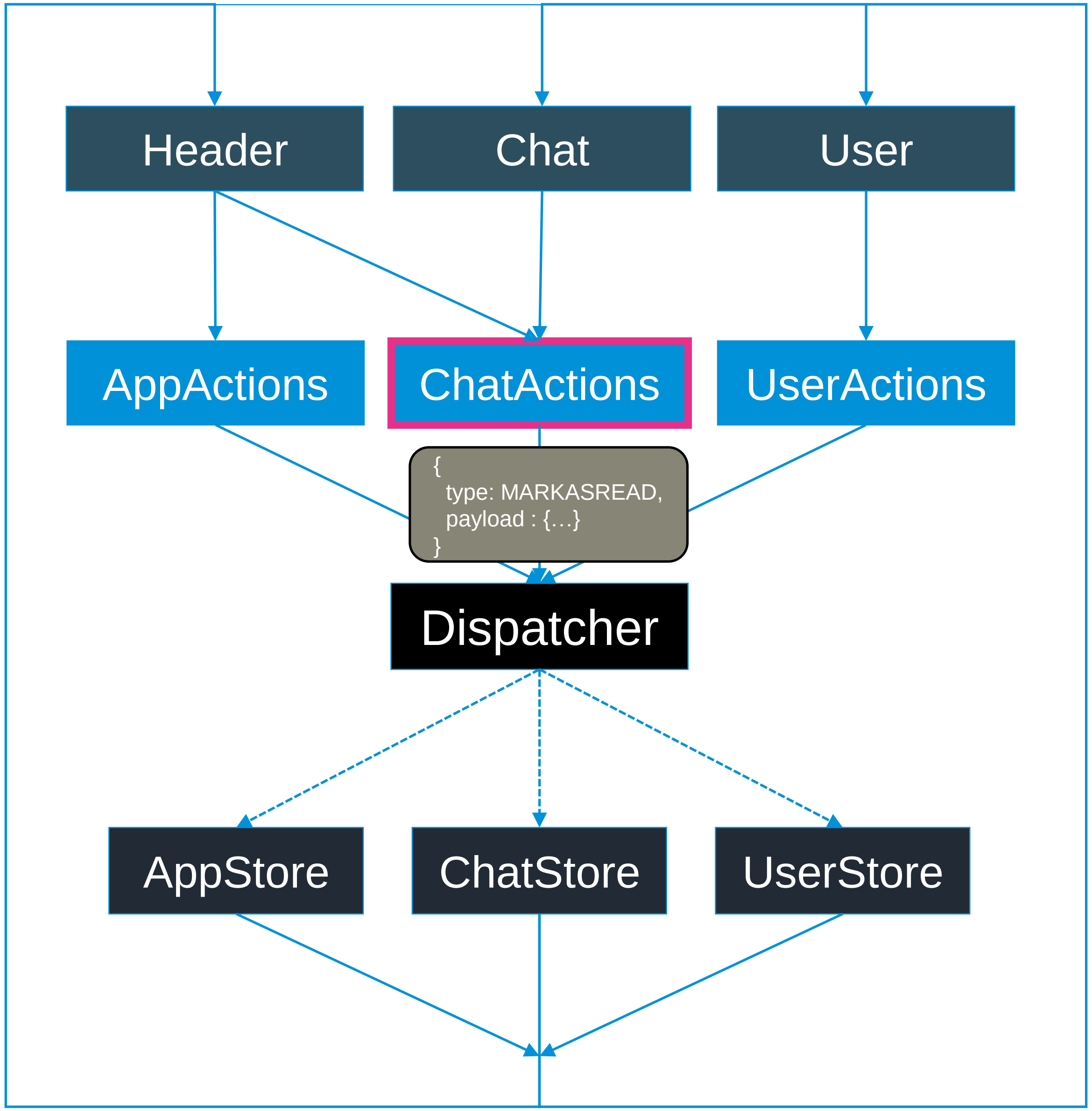

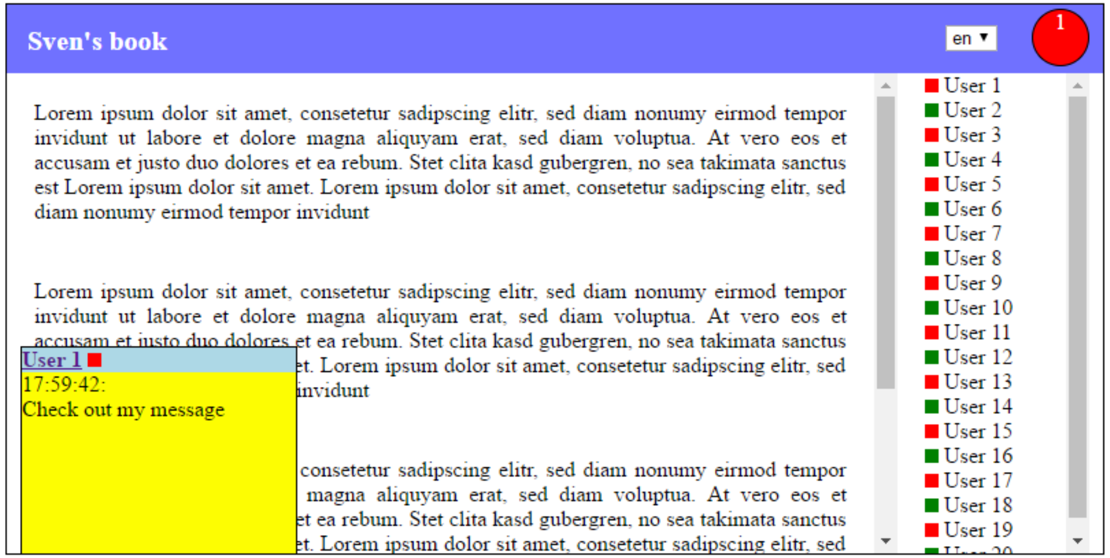

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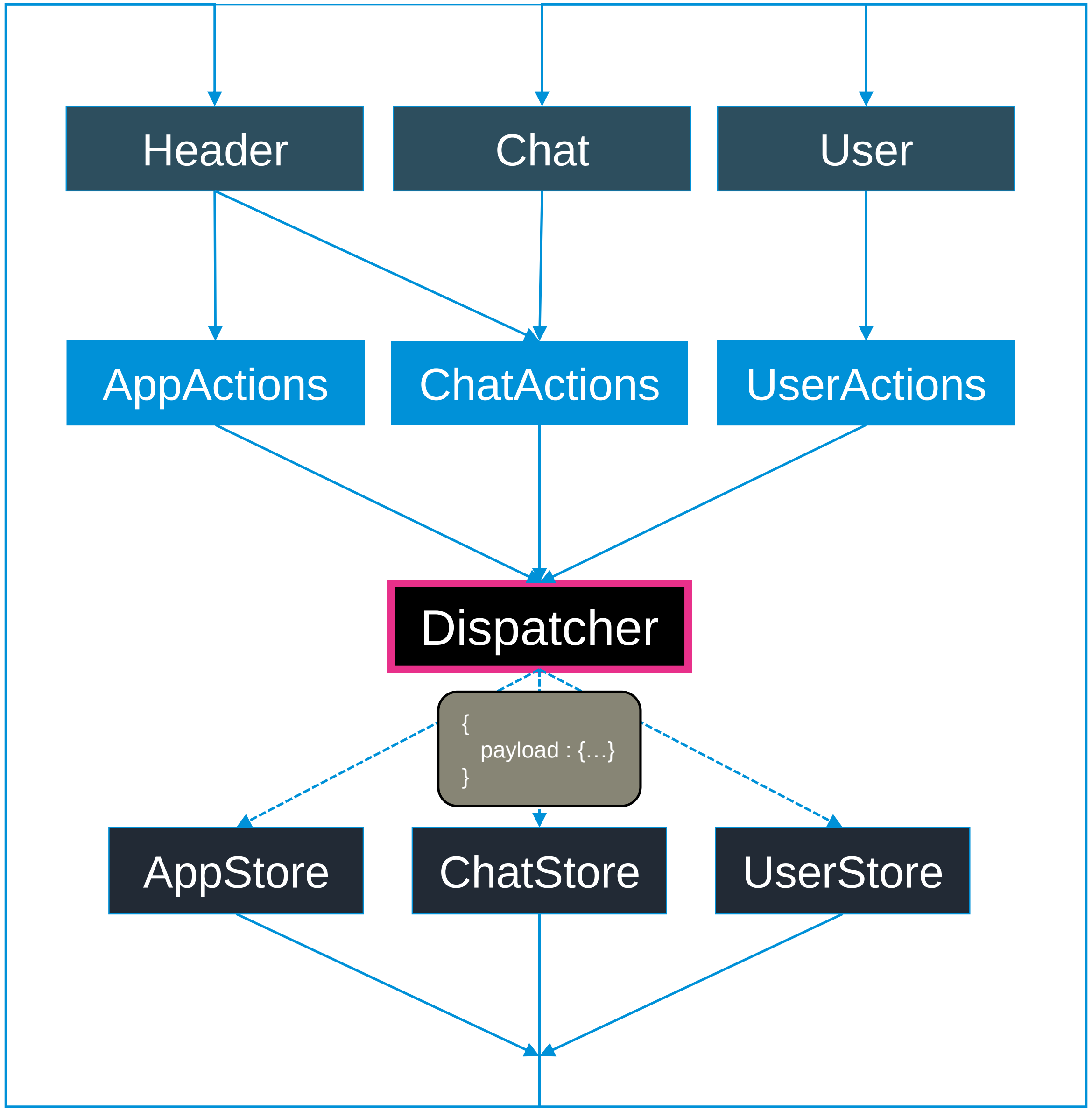
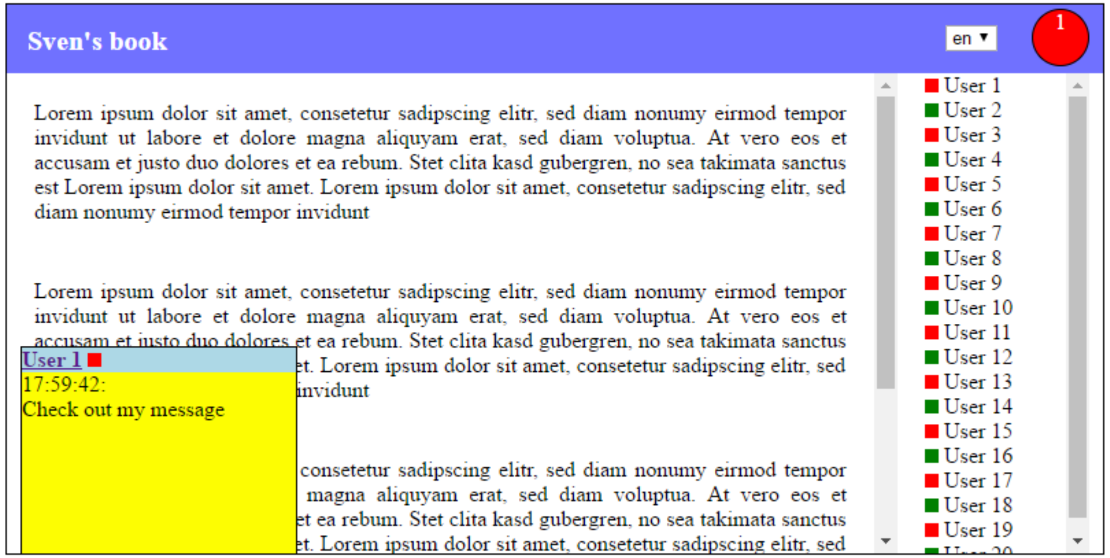


Header
Chat
User
AppActions
ChatActions
UserActions
Dispatcher
{
payload : {…}
}
AppStore
ChatStore
UserStore



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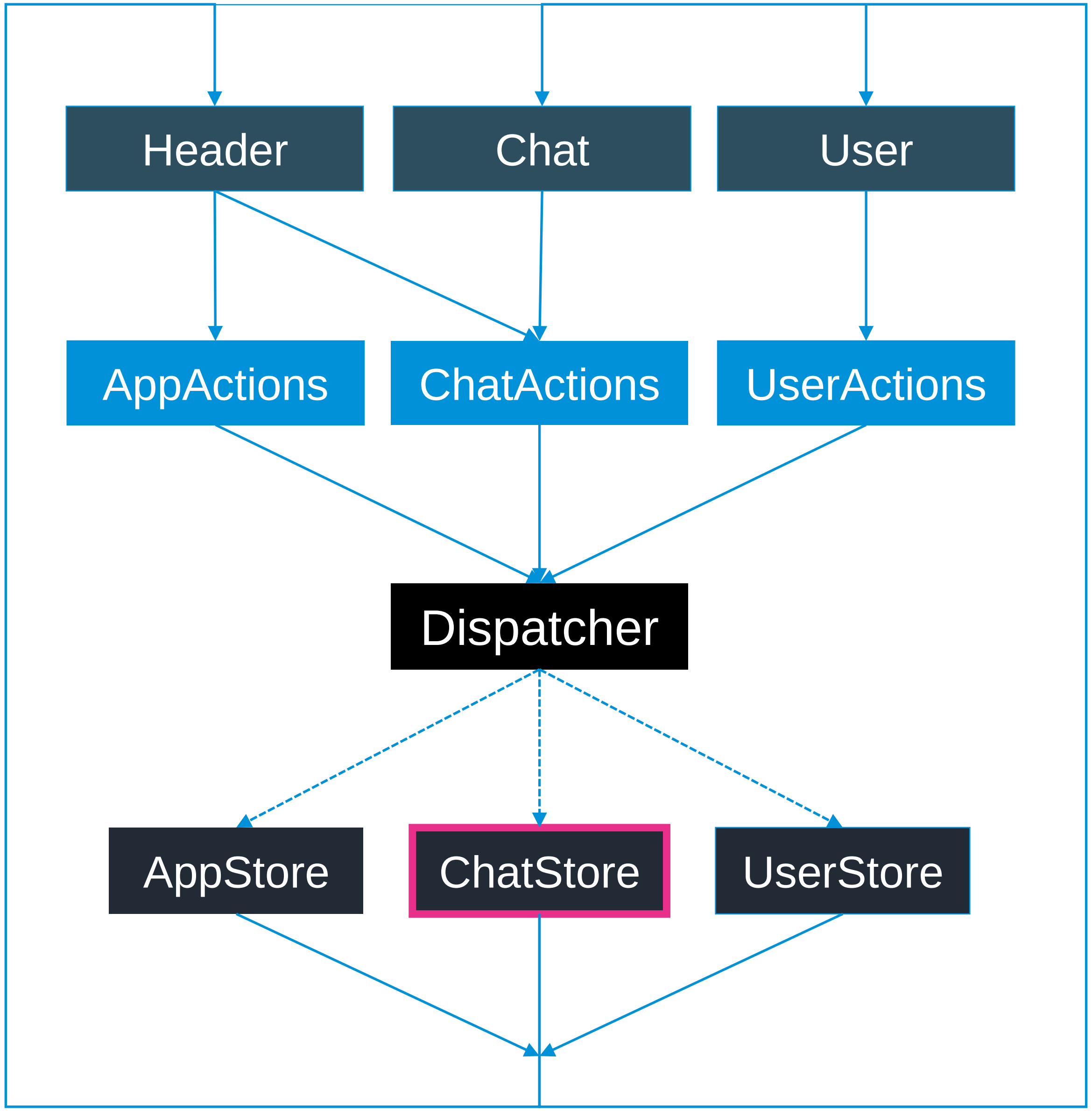

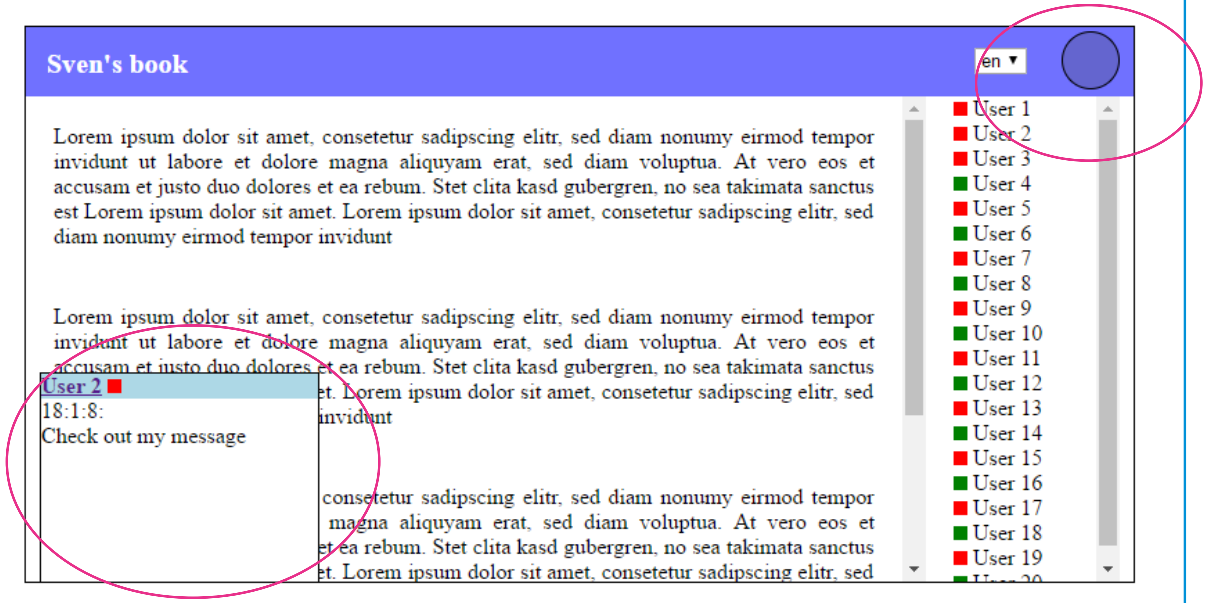

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User 2 🟥
18:1:8:
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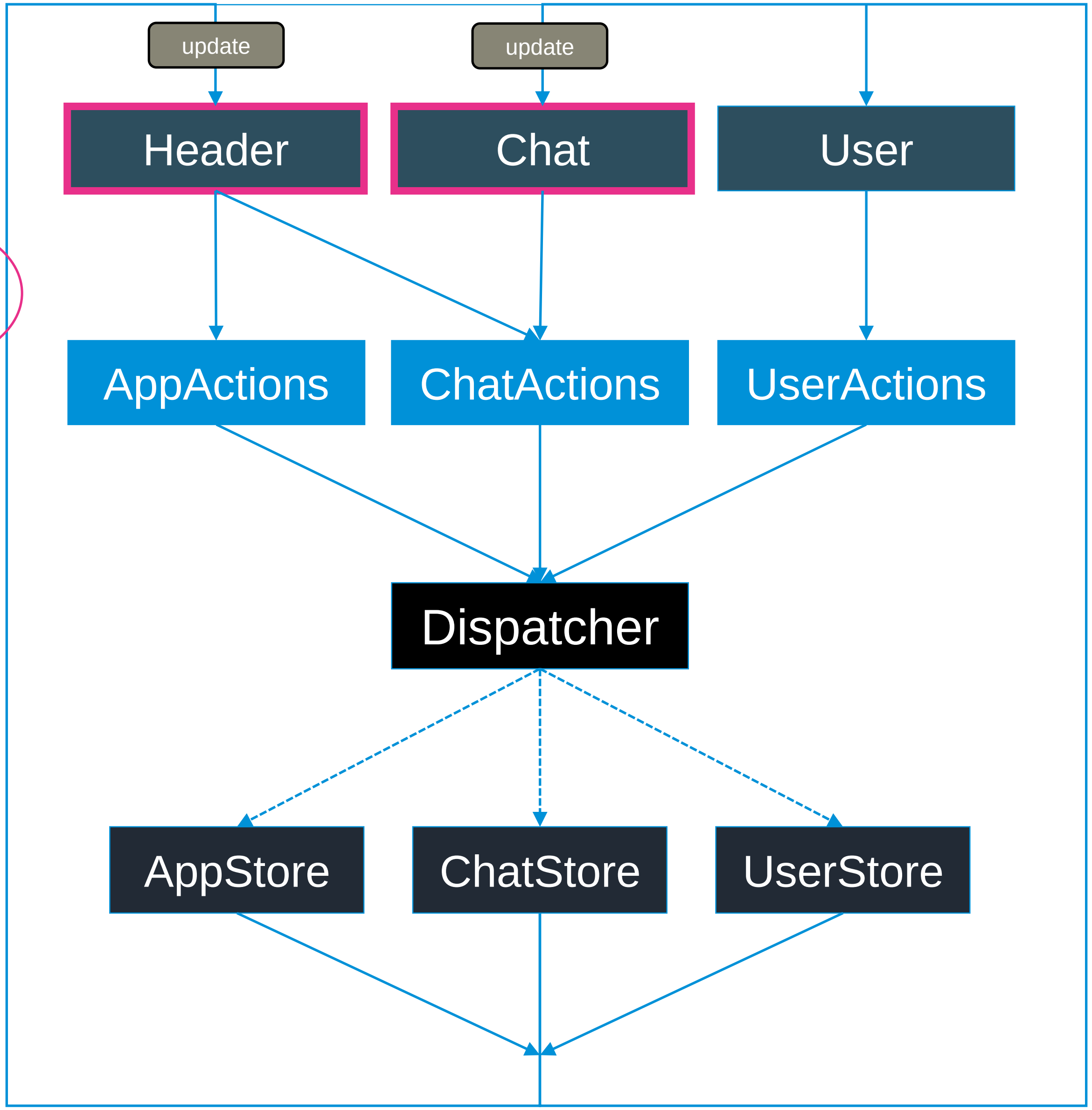

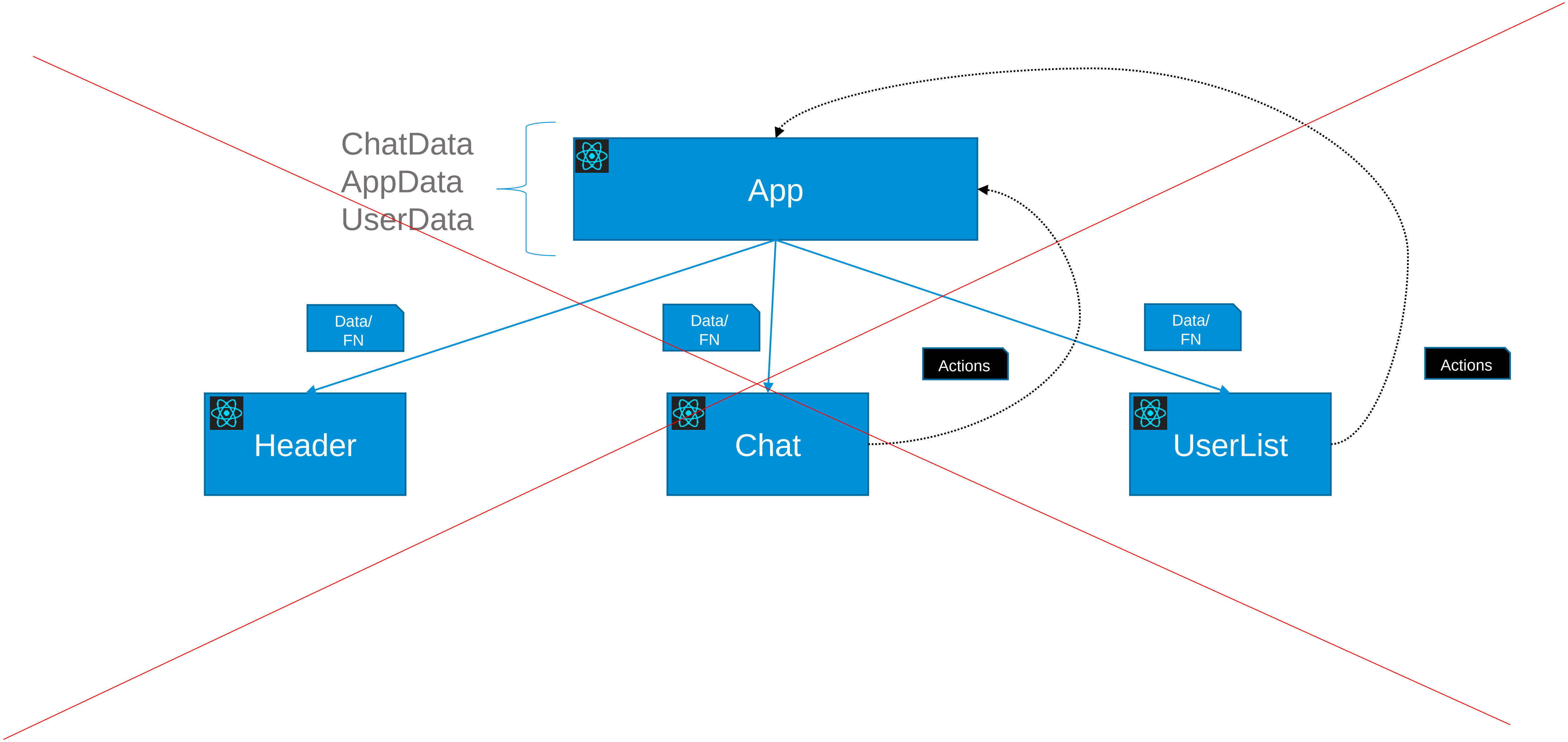
ChatData
AppData
UserData
App
Data/
FN
Data/
FN
Actions
Data/
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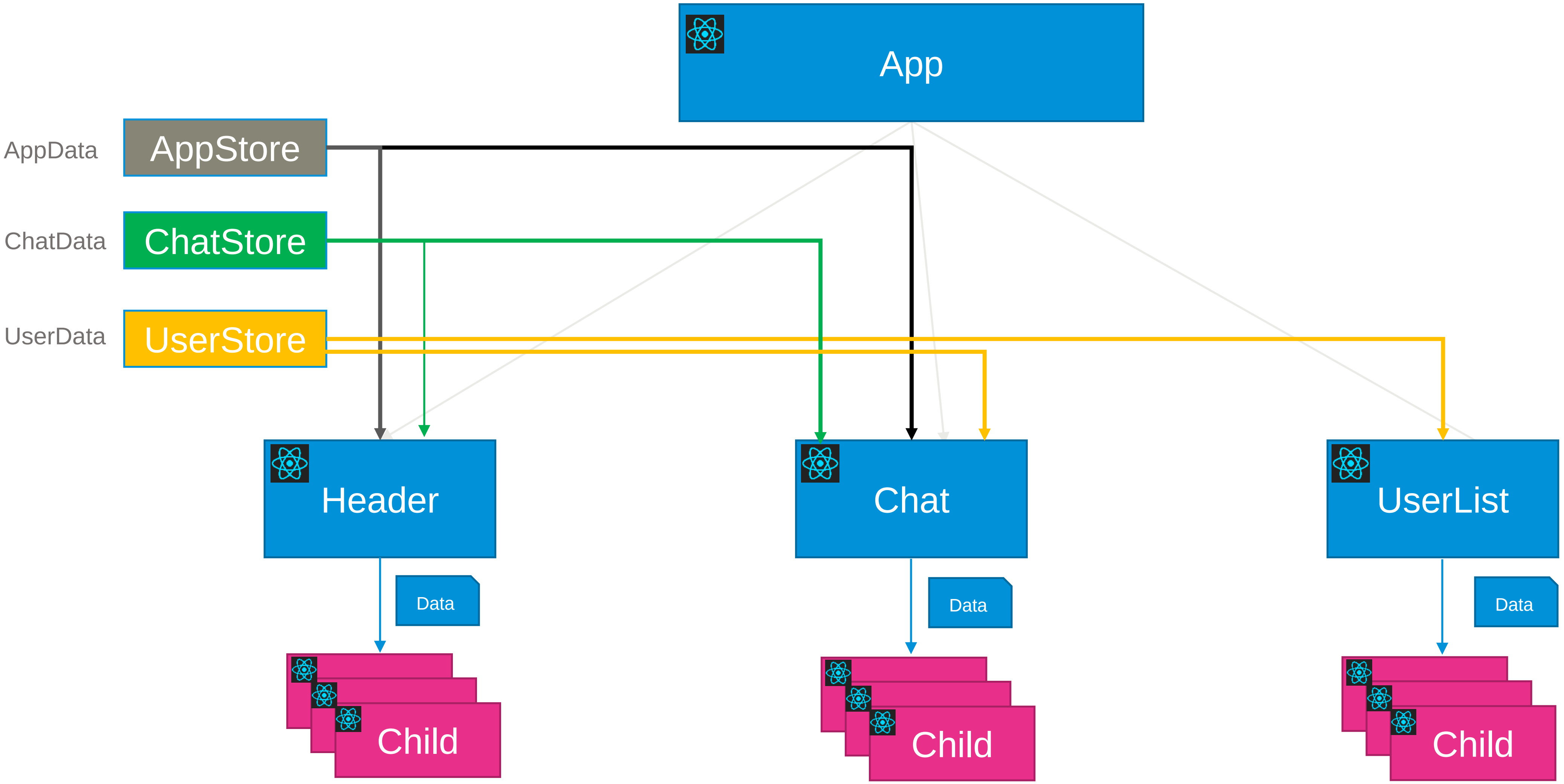
Actions
Header
Chat
UserList


App
AppData
AppStore
ChatData
ChatStore
UserData
UserStore
Header
Chat
UserList
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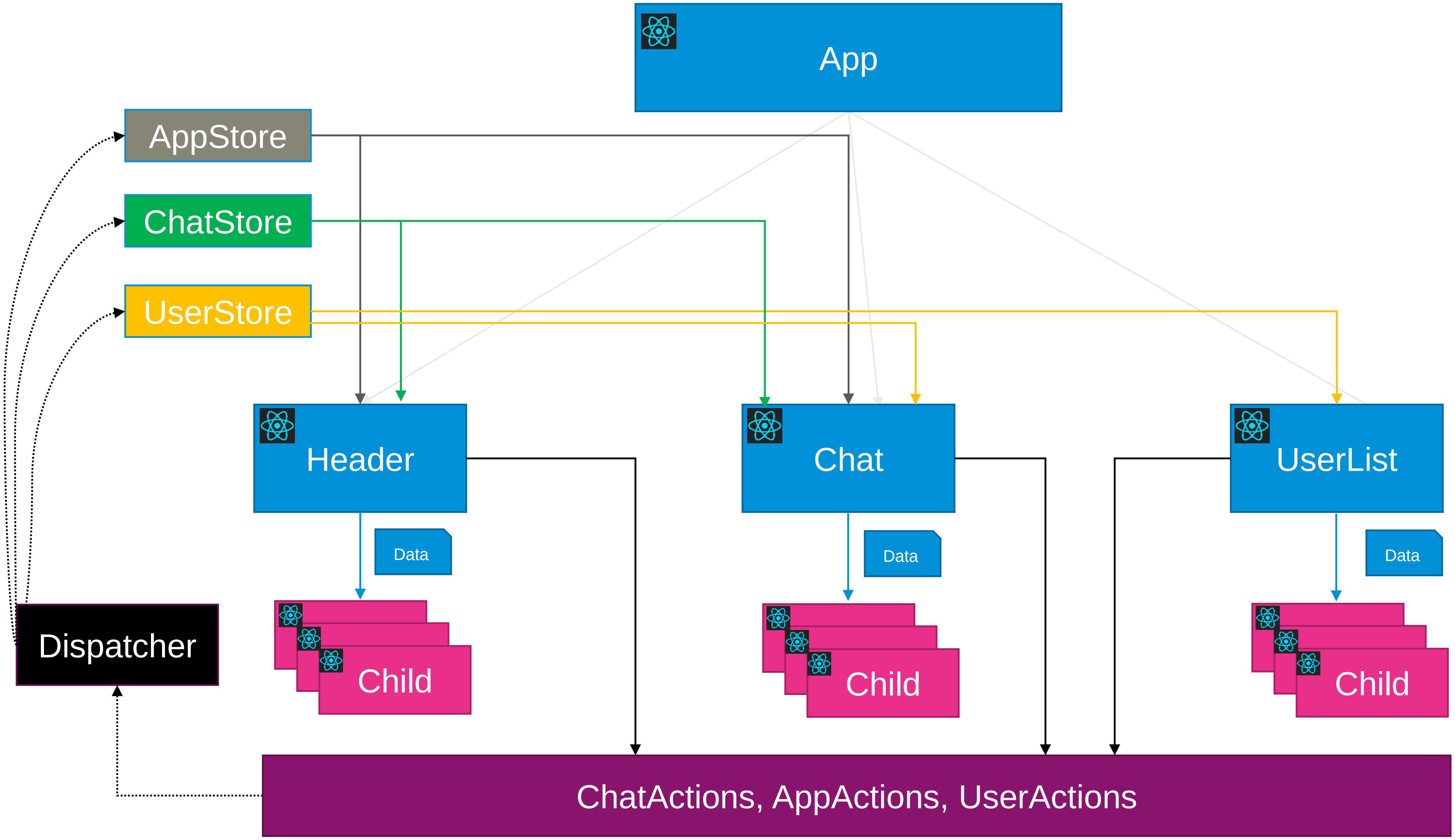

App
AppStore
ChatStore
UserStore
Header
Chat
UserList
Data
Data
Data
Child
Child
Child
Dispatcher
ChatActions, AppActions, UserActions

When flux?

- **Complex** data relations
  - > 1 components need same data (at once)
  - God components

- **BUT: Local state is fine!**
  - **Combine** flux + local state
  - Short-term data
  - Medium-term data

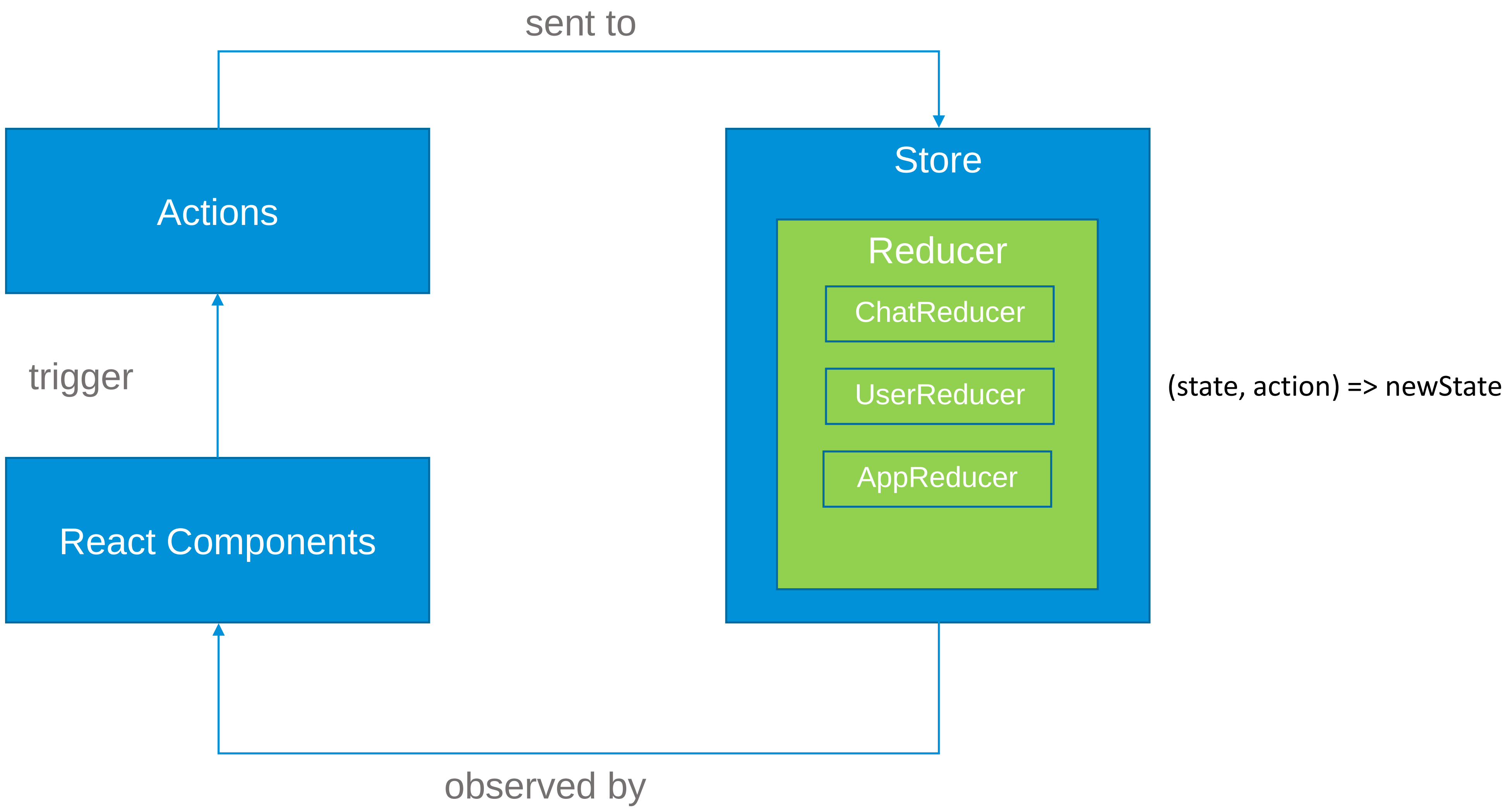
REDUX

Redux

- **Most famous** Flux **implementation**
  - Twitter, Reddit, …

- Concepts
  - **Pure functions**
  - **Immutability**
  - **Smart** components, **dumb** components

Redux



sent to

Actions

trigger

React Components

Store

Reducer

ChatReducer

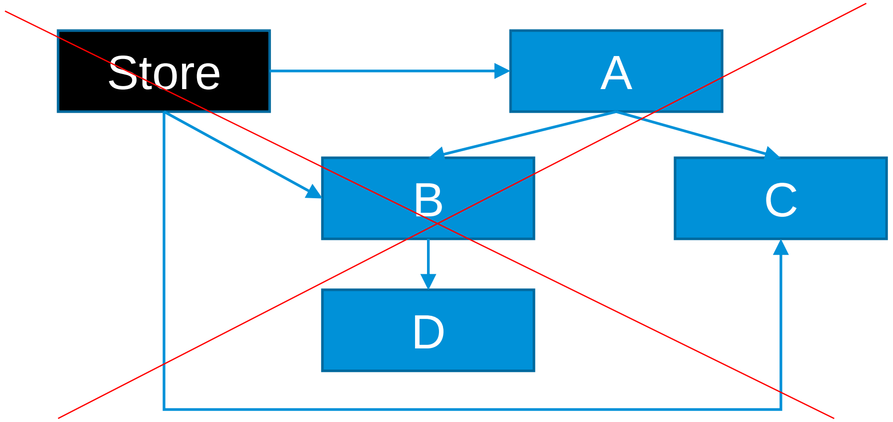
UserReducer

AppReducer

(state, action) => newState

observed by

Redux gotchas...



- **Don’t connect all** components
  - Choose wisely (smart → dumb)

- **Immutability**
  - Updates could get lost

```
// don't do this in Redux
function addChat(state, action) {
  return state.chats.push(action.payload);
}
```

```
// stay immutable
function addChat(state, action) {
  return [ ...state.chats, action.payload];
}
```

Redux conclusion

- Advantages
  - **Predictable** updates
  - **Testable**
  - **Serializable** actions

- Disadvantages
  - **Boilerplate**
  - Learning curve
  - **Functional** & **immutability** → Core concepts

MOBX

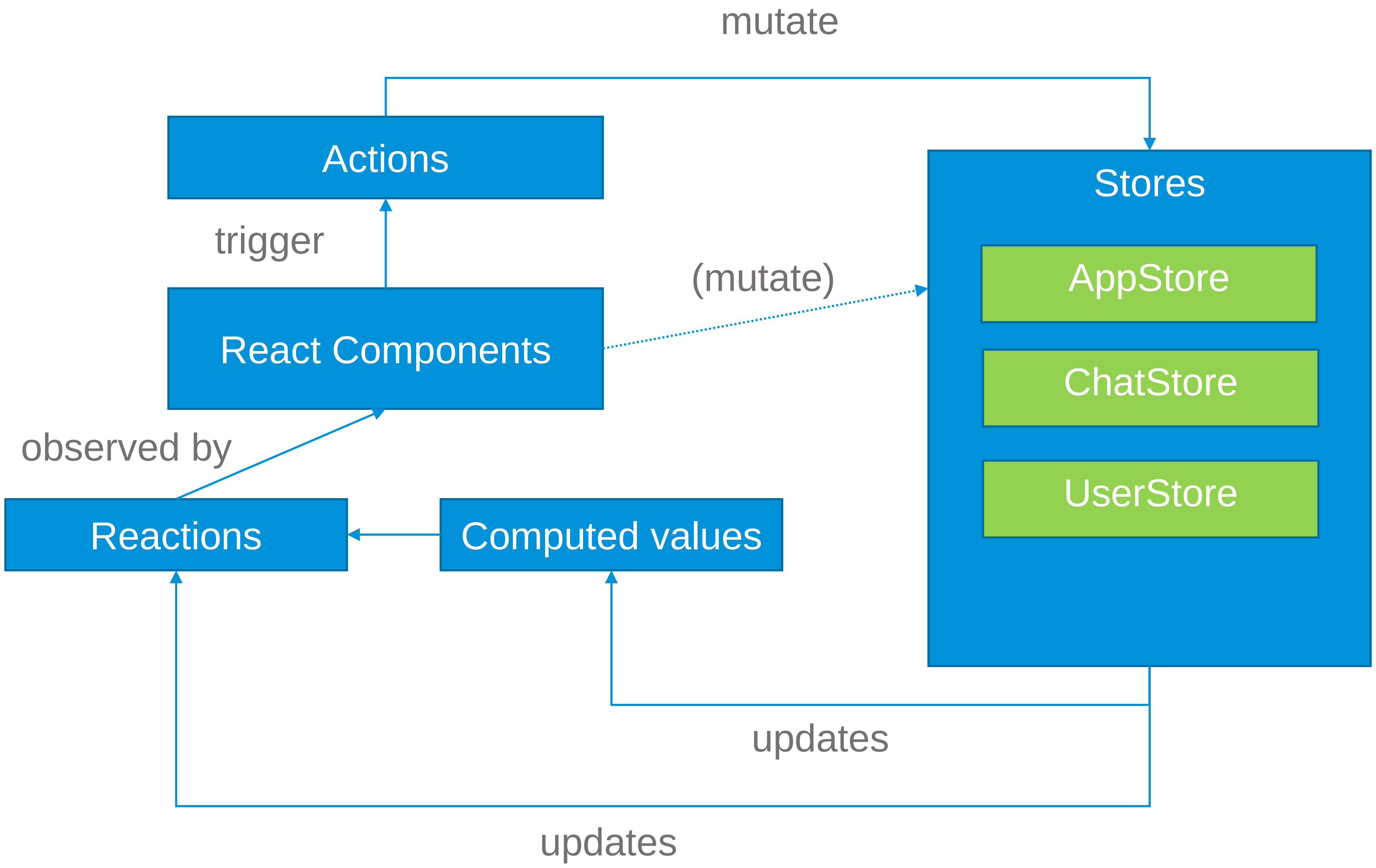
MobX

- **Second most famous** state mangement lib

- More **OO**
  - Classes & references

- Concepts
  - **Mutability**
  - **Observables**

MobX



mutate

Actions

Stores

trigger

(mutate)

AppStore

React Components

ChatStore

observed by

UserStore

Reactions

Computed values

updates

updates

MobX gotchas...

- Mutability

```
addChat(chat) {
    return this.chats.push(chat);
}
```

- Put actions in store

```
<button onClick={() => store.chats.push(chat)} />
```

//PLEASE DON‘T

⬇

```
<button onClick={() => store.addChat(chat) } />
```

//PLEASE DO

MobX conclusion

- MobX === Magic
  - Less boilerplate

- **Short** learning curve
  - Known concepts

- Can be **hard to debug**

]v[
EVERLAST
EVERLAST

Learning curve

	]v[
• New concepts • Boilerplate	• Known concepts • Framework magic

Scalability

	]v[
• Scales by nature • Strict concepts • Centralized changes	• Does not scale by default • Less opinionated • Mutate from everywhere

Debuggability / Testability

	]v[
• Pure functions • More code • Simple state tree, normalized	• Magic • Less code • Sometimes hard to reason about

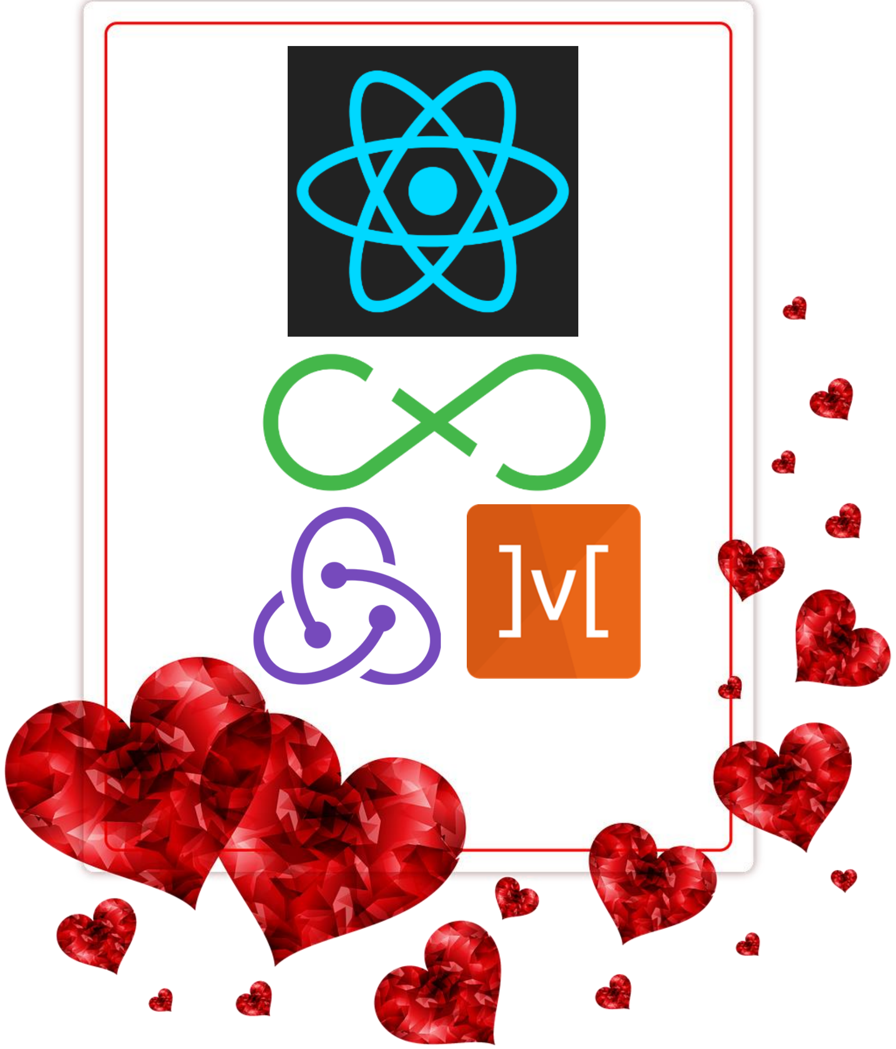
Redux and MobX

- MobX
  - Short learning curve
  - Less code
  - Less opinionated (needs constraints in bigger projects)

- Redux
  - Constraints
  - Highly testable
  - Mature & State of the art

Conclusion

- **Do you need** external state management?
  - Data complexity
  - Component relations
- Only use **where it makes sense**
- MobX or Redux?
  - “**Interchangable**”
- Relay, Apollo, GraphQL



All images taken from pixabay.com