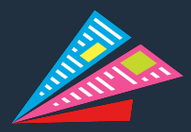
Introduction to Redux

@axross

React.js meetup #2 on Sep 9 2015

Hello :)

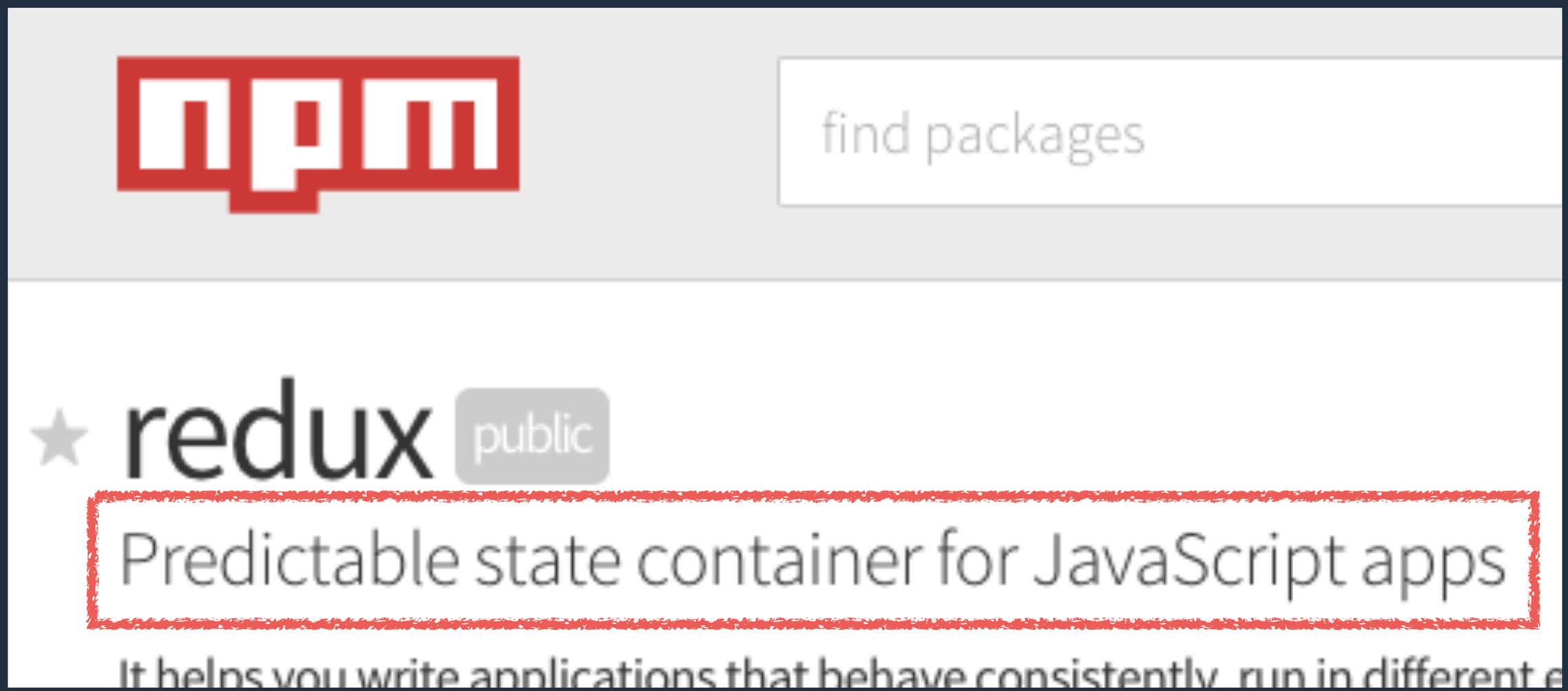
- @axross / Kohei Asai
- Working in  Gunosy Inc.
- #javascript, #nodejs, #reactjs

I developing...

- グノシー内で漫画が読めるコンテンツ
    - 「某少年の事件簿」
    - 「某カンタービレ」
- npm i -S react redux react-router bemmer
- よろしくお願いします！

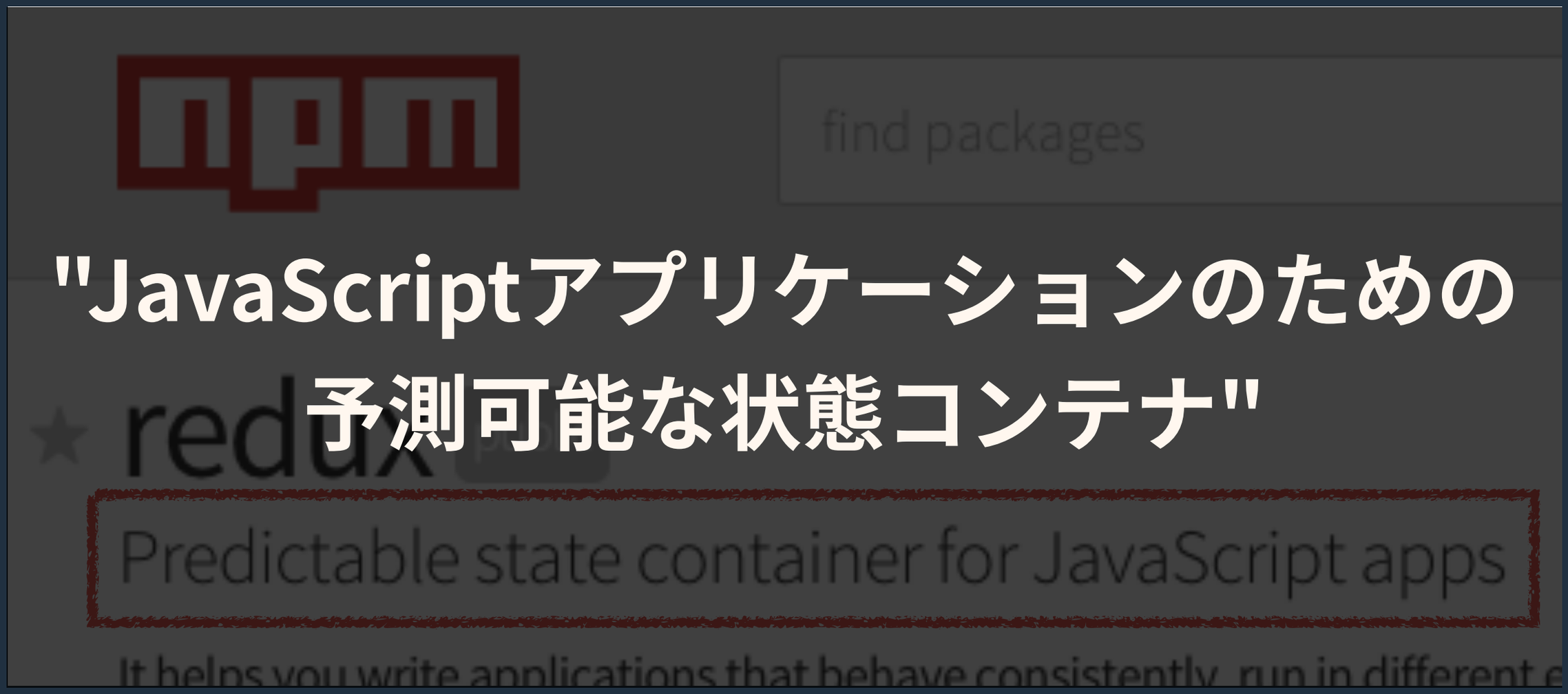
Redux

What is Redux?



https://www.npmjs.com/package/redux

What is Redux?



"JavaScriptアプリケーションのための
予測可能な状態コンテナ"

https://www.npmjs.com/package/redux

Family of Flux

Fluxxor
1,425stars

Flumox
1,445stars

Reflux
3,670stars

RxFlux
192stars

Redux
5,832stars

Counted on Sep 8 2015

Family of Flux

Fluxxor
1,425stars

Flumox
1,445stars

Reflux
3,670stars

RxFlux
192stars

Redux
5,832stars

ReduxもFluxの仲間

Counted on Sep 8 2015

How did you know Redux?

README.md

Flummox

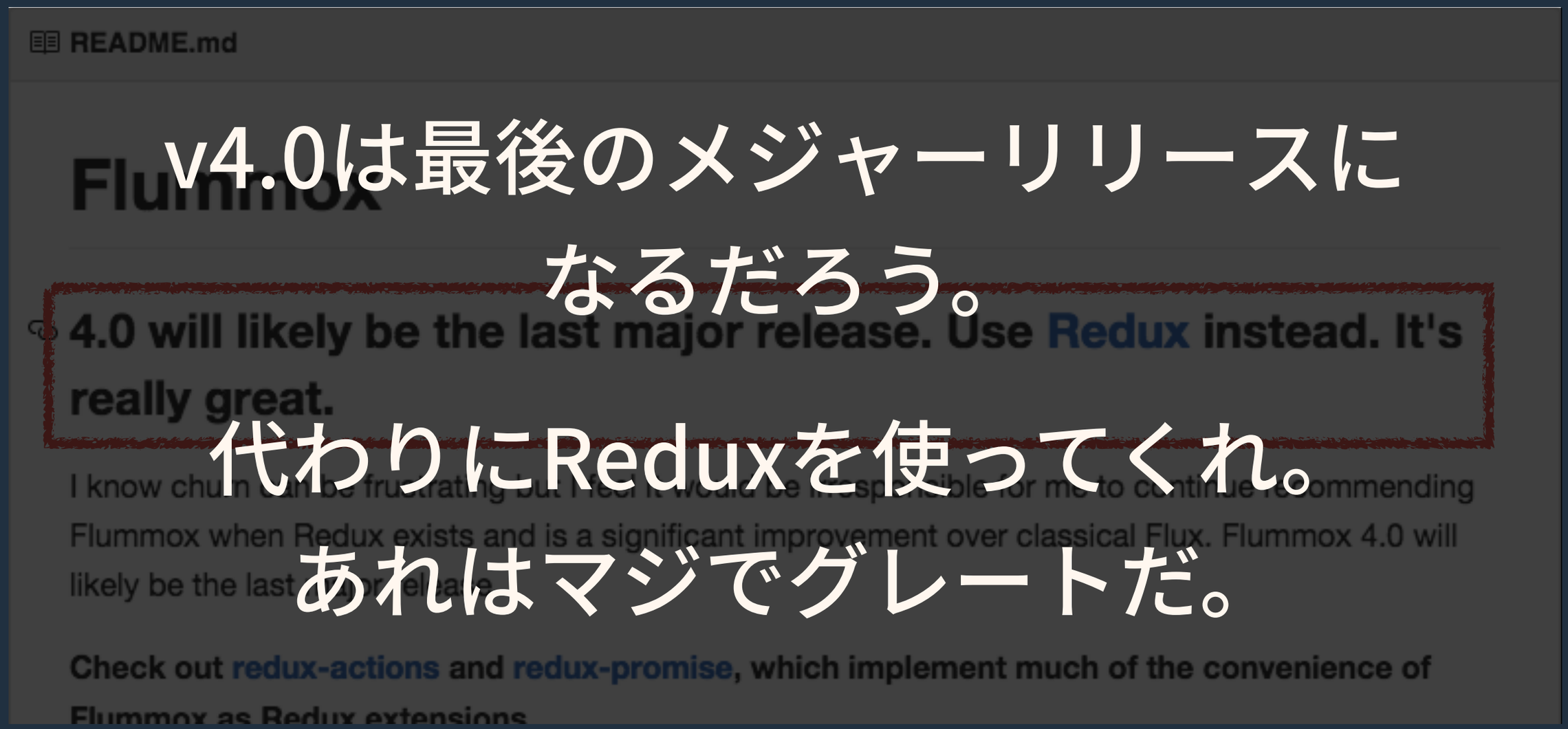
4.0 will likely be the last major release. Use Redux instead. It's really great.

I know churn can be frustrating but I feel it would be irresponsible for me to continue recommending Flummox when Redux exists and is a significant improvement over classical Flux. Flummox 4.0 will likely be the last major release.

Check out redux-actions and redux-promise, which implement much of the convenience of Flummox as Redux extensions.

https://github.com/acdlite/flummox

How did you know Redux?



v4.0は最後のメジャーリリースになるだろう。

代わりにReduxを使ってくれ。

あれはマジでグレートだ。

https://github.com/acdlite/flummox

Redux is...

- Flummoxの作者が手放しで賞賛
    - いまやReduxの周辺作ったりしてる
- データフローはFlummoxに似てる
- Flummoxではサポートしていなかった、「状態の管理」に重きを置いている

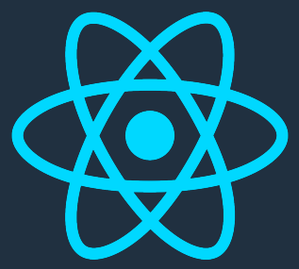
Motivation

SPA get more States

- JavaScriptのSPAを作るのが当たり前になり、凝ったつくりを求められることが多くなった
- より多くの状態の管理が必要になる

too Hard to managing states

- 絶えず変化する状態を管理するのは難しい
- いずれ手に負えなくなる
- バグの再現がすぐにできなくなる
- 機能追加の際に影響範囲が認識しにくい



is great, but...

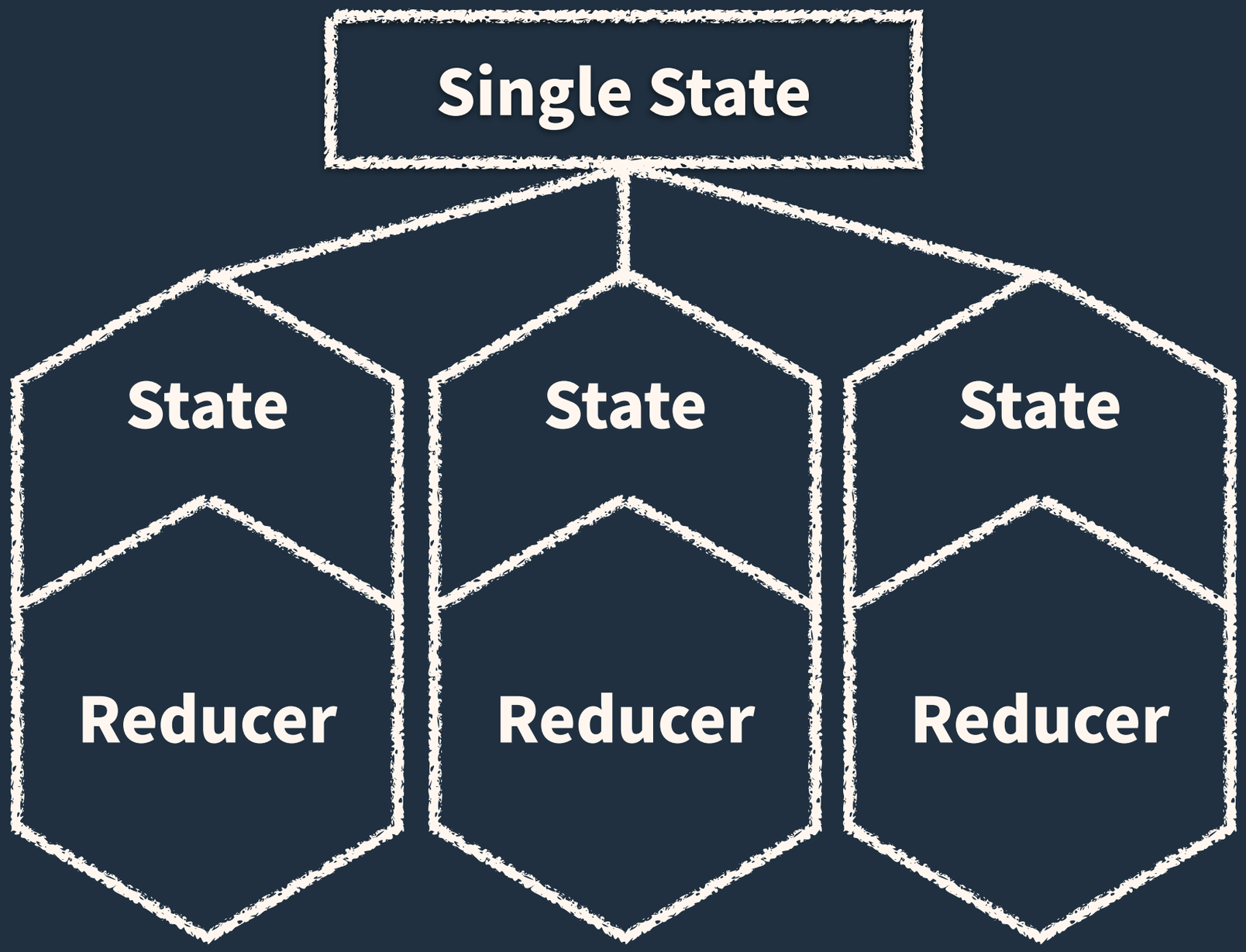
- ReactでDOMと状態は切り離された
    - Componentは値によって参照透過に
      DOMを操作する
- しかし、その状態の「管理」は手付かず

We are still on one's way Flux

- 「状態の管理」をFluxというフローに当てはめて、僕らは解決しようとした
- しかし、まだ「これだ」というものは出てきていなかった
- Reduxはこの「状態の管理」を一番うまくできるFlux

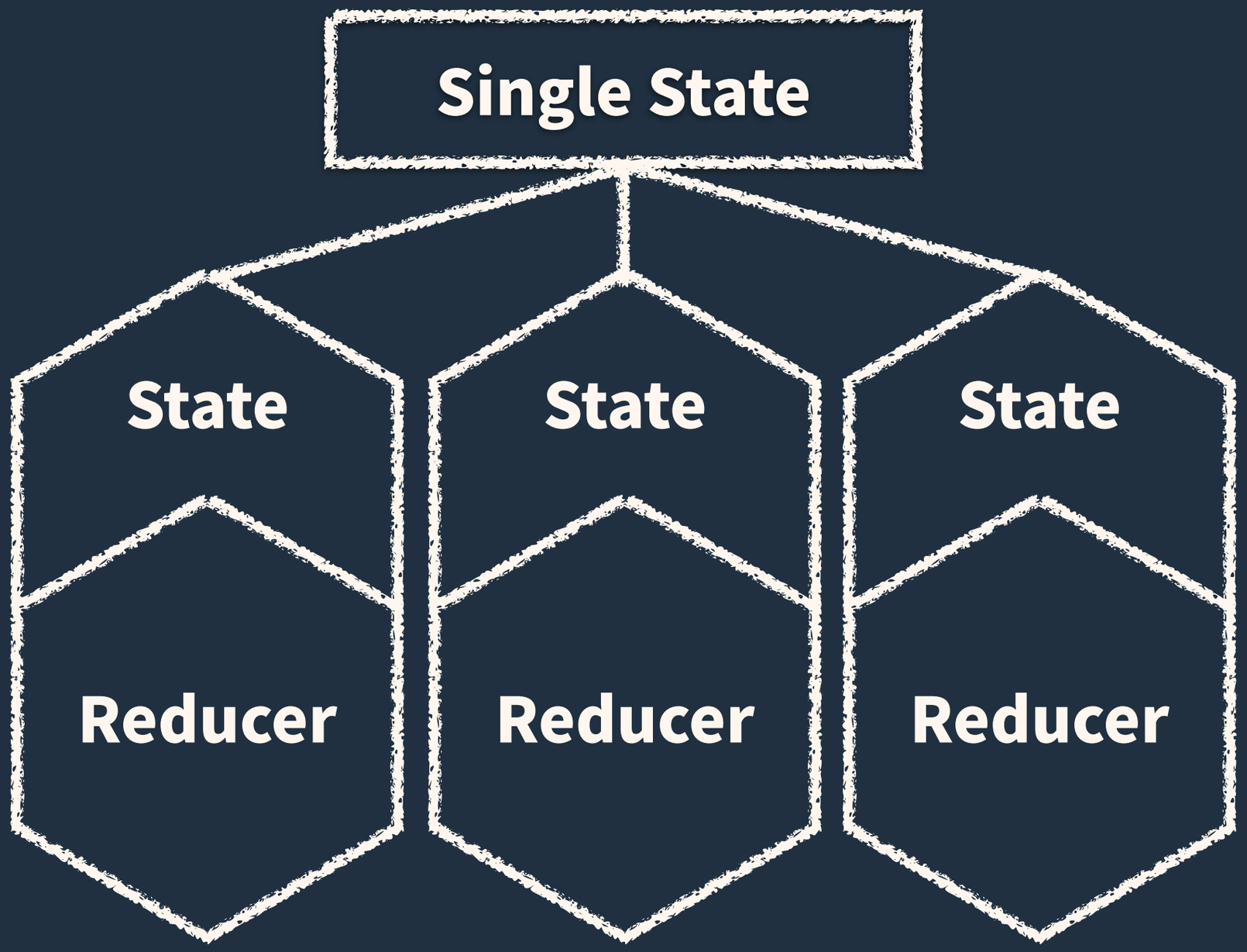
Data Flow

Single State Tree

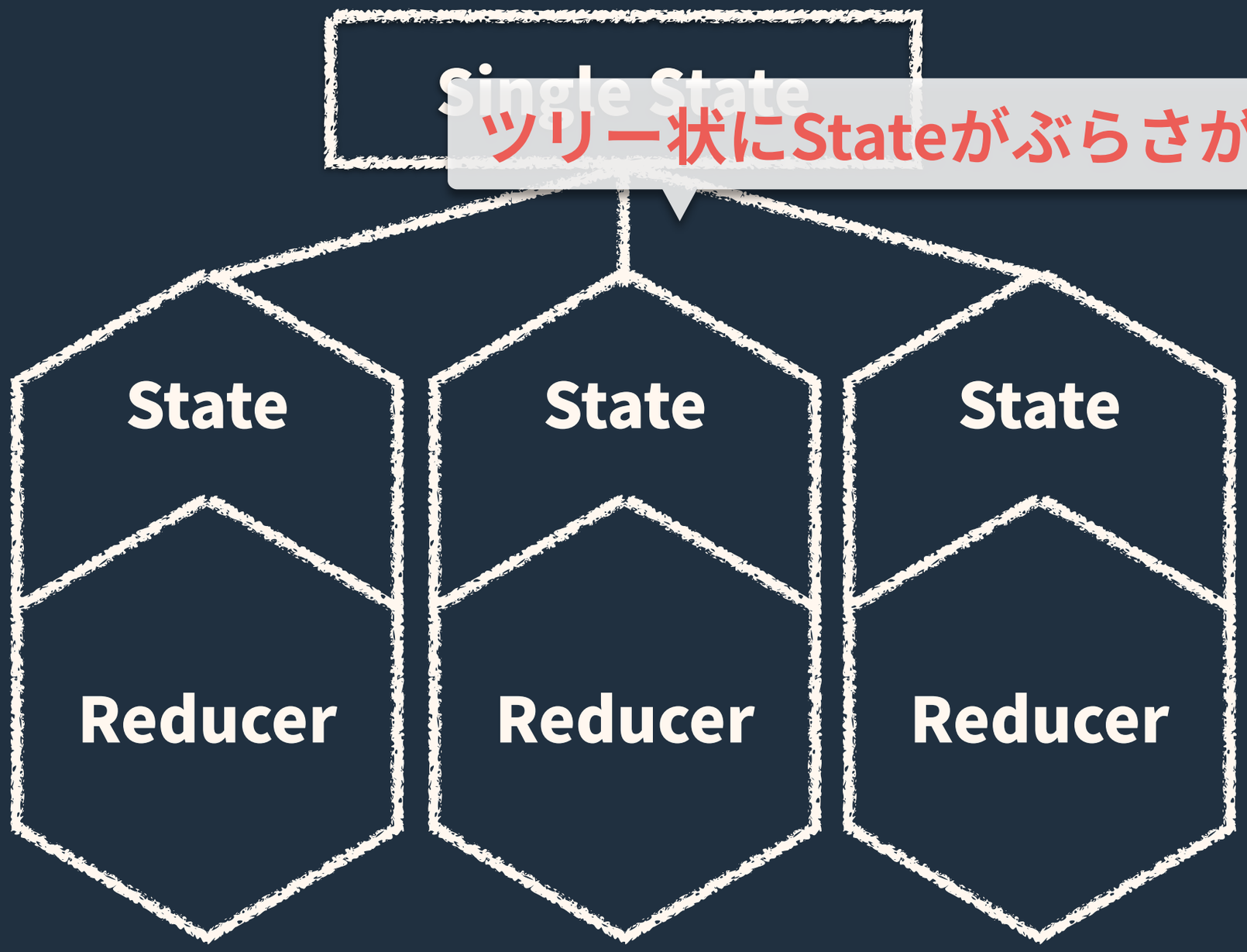


Single State Tree

Reduxは1つのStateのルート(根)がある

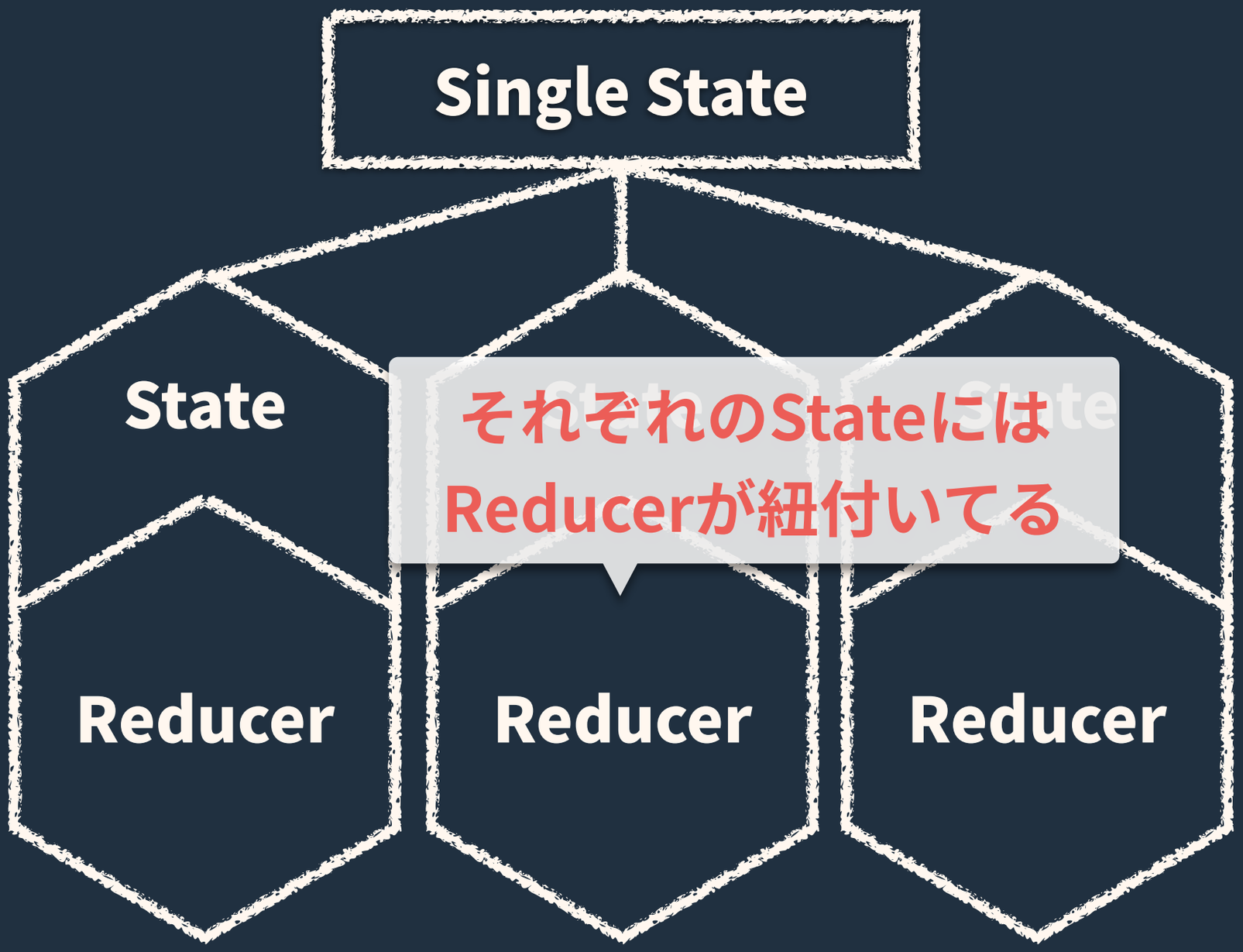


Single State Tree



ツリー状にStateがぶらさがってる

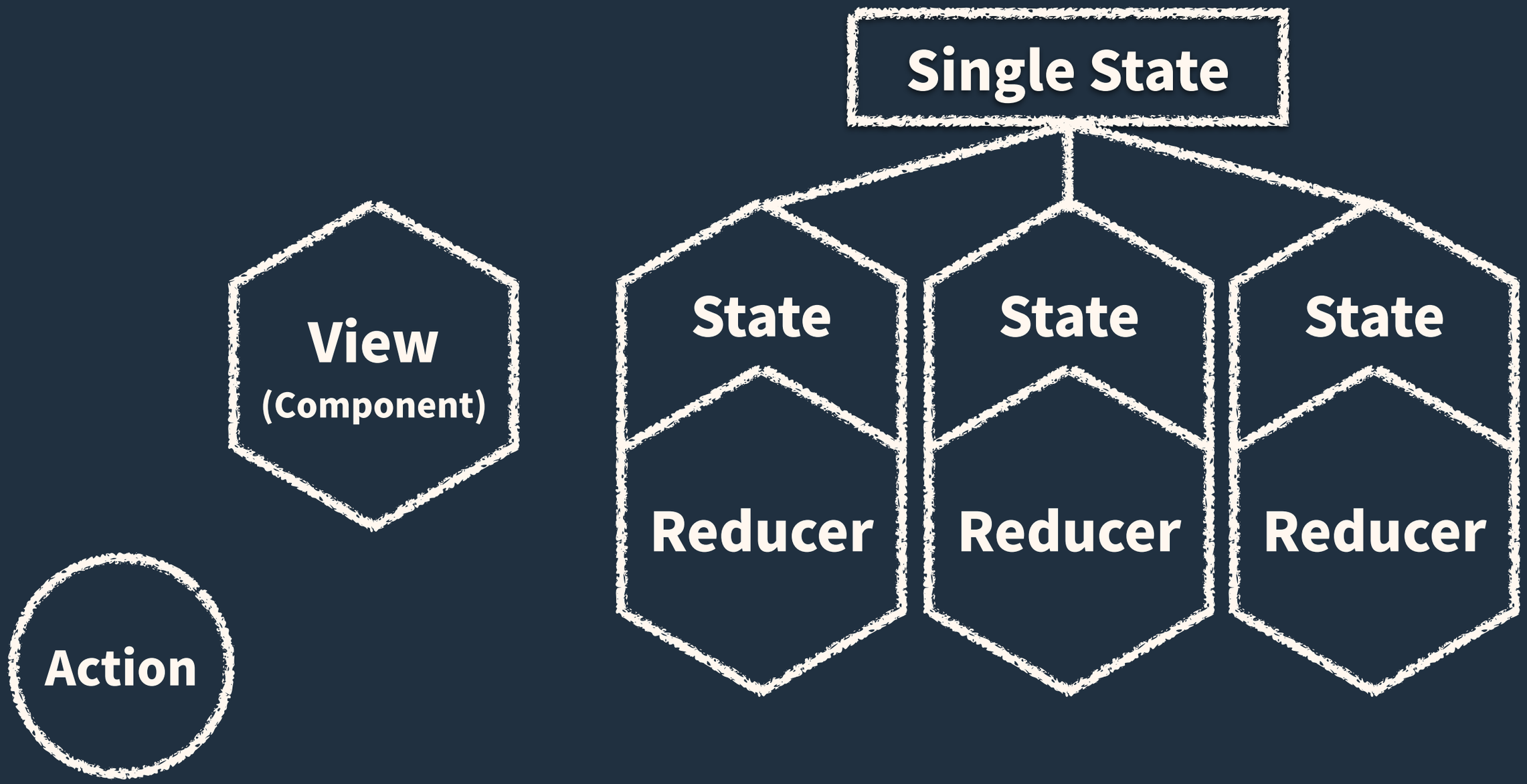
Single State Tree



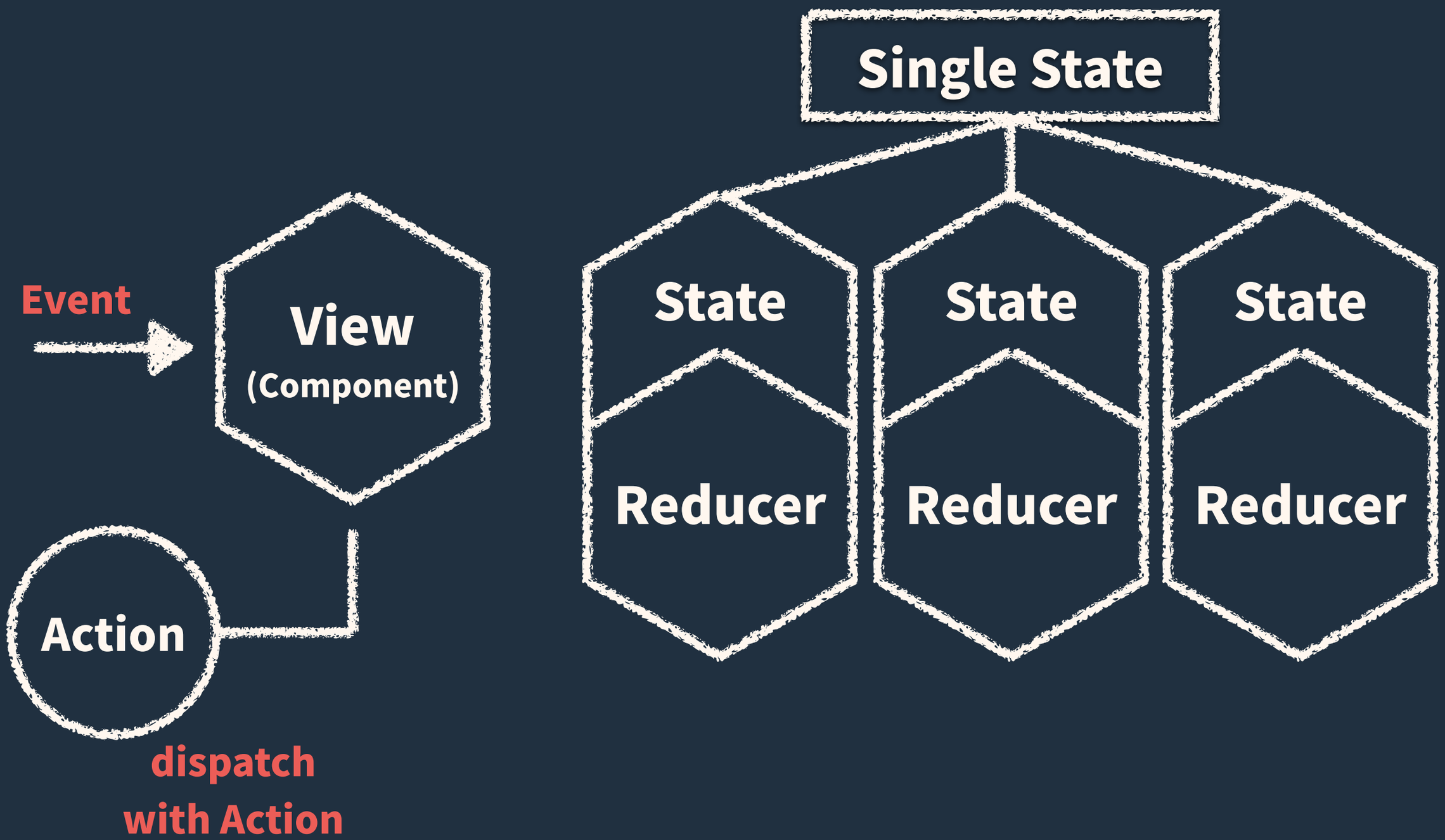
Reducer

- Stateフィルター/マッパー
- Reducerは
    - 自分のStateを変更するかどうか
    - Stateをどう更新するか、を担う
- Reducer自体はStateではない

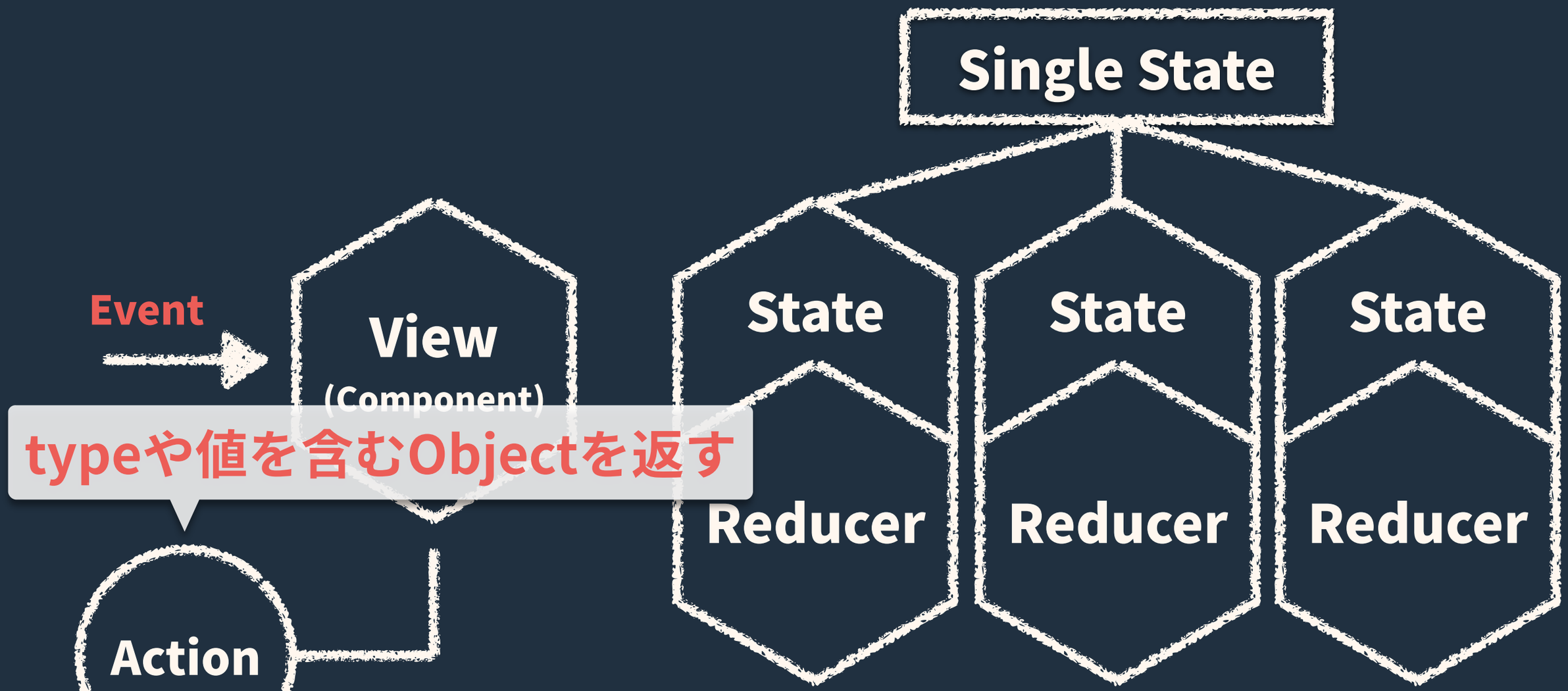
Data Flow


Single State
View
(Component)
State
Reducer
State
Reducer
State
Reducer
Action

Data Flow


Single State
State
Reducer
State
Reducer
State
Reducer
Event
View
(Component)
Action
dispatch
with Action

Data Flow


Single State
Event
View
(Component)
State
Reducer
State
Reducer
State
Reducer
typeや値を含むObjectを返す
Action
dispatch
with Action

Like this:

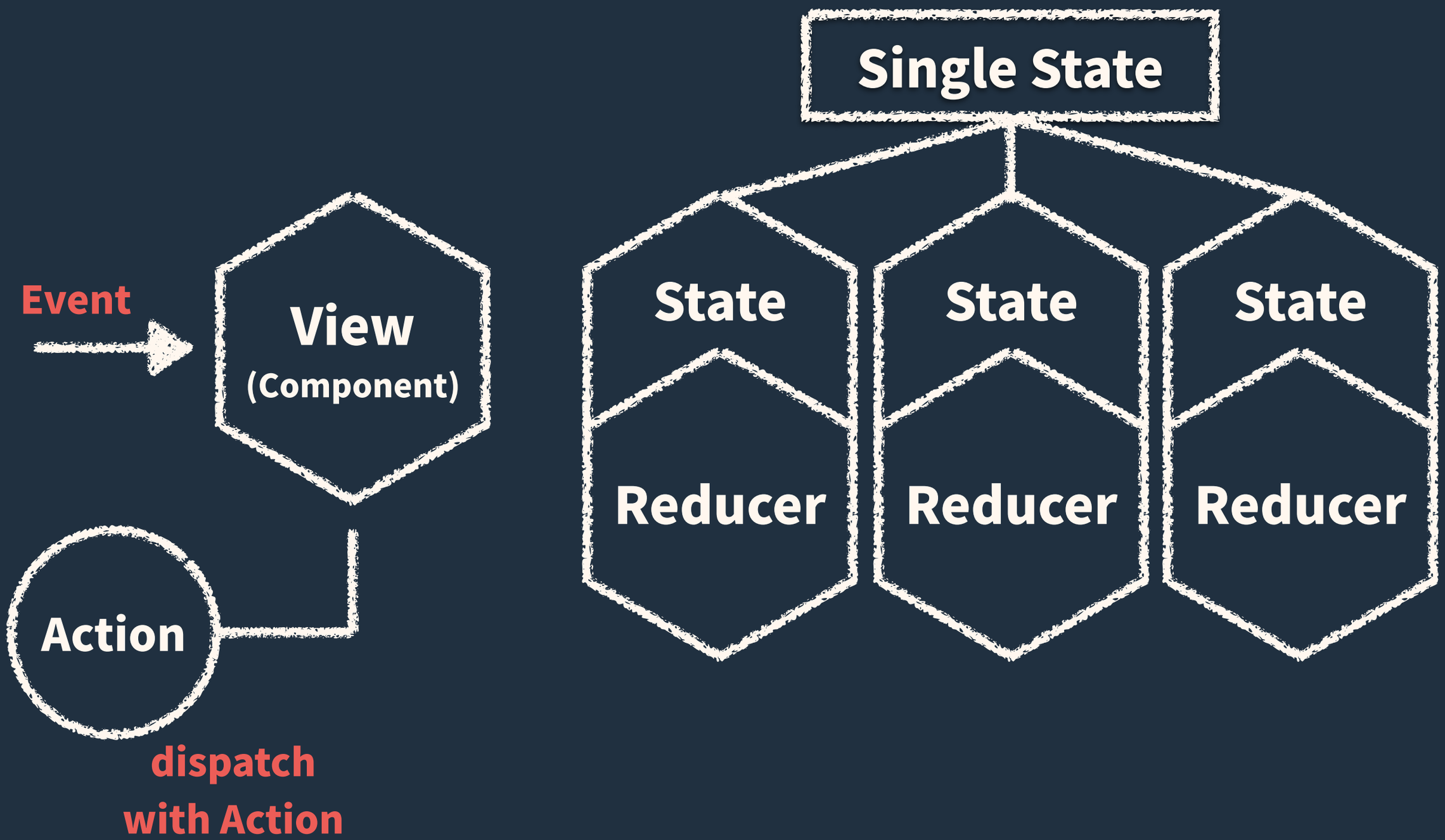
```
export const addTodo = body => {
  return {
    type: 'TOĐO_AĐĐ',
    todo: new Todo(body),
  };
};
```

Like this:

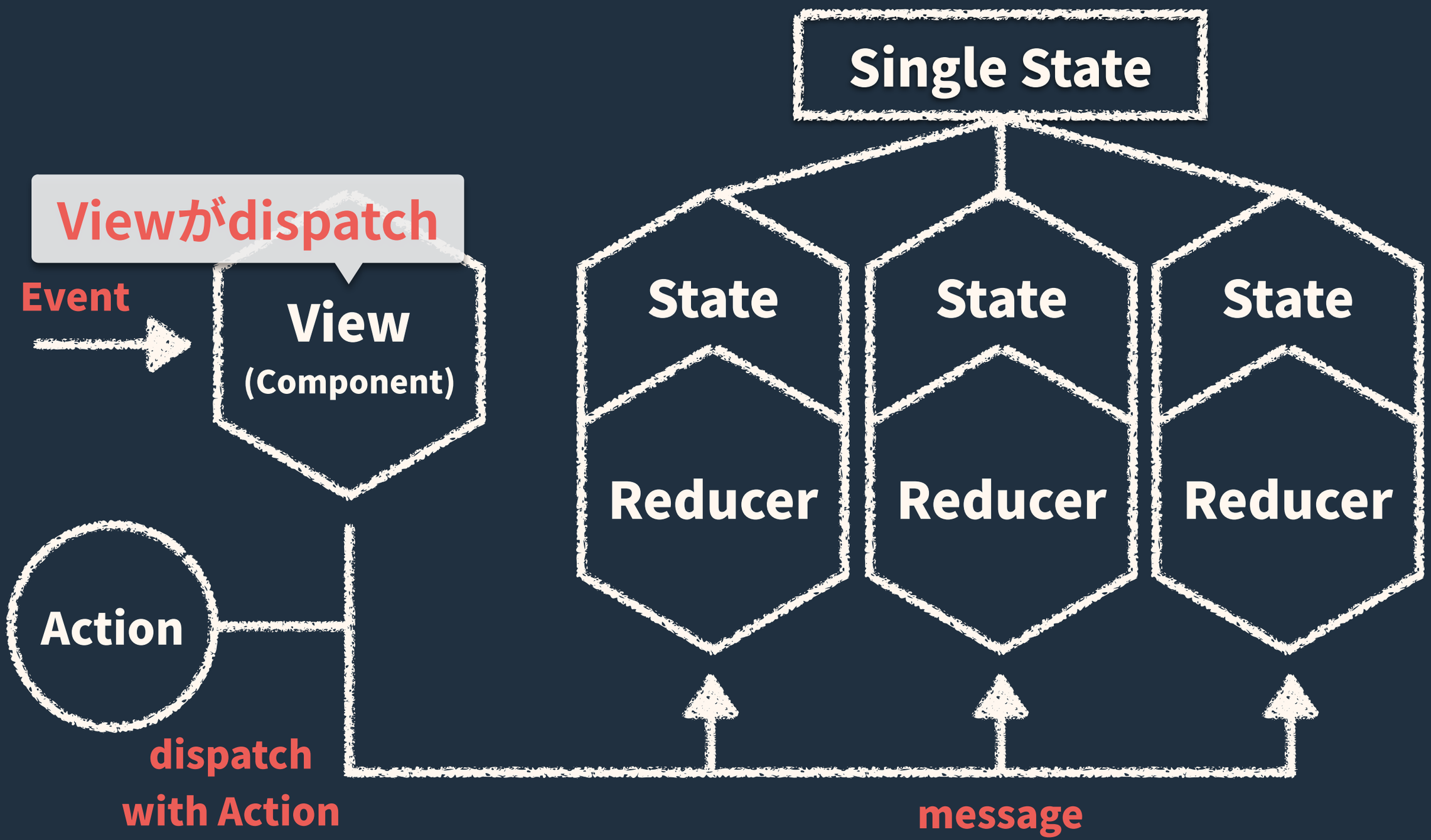
```
export const addTodo = body => {
  return {
    type: 'TODO_ADD',
    todo: new Todo(body),
  };
};
```

typeと値を返すだけの単純な関数

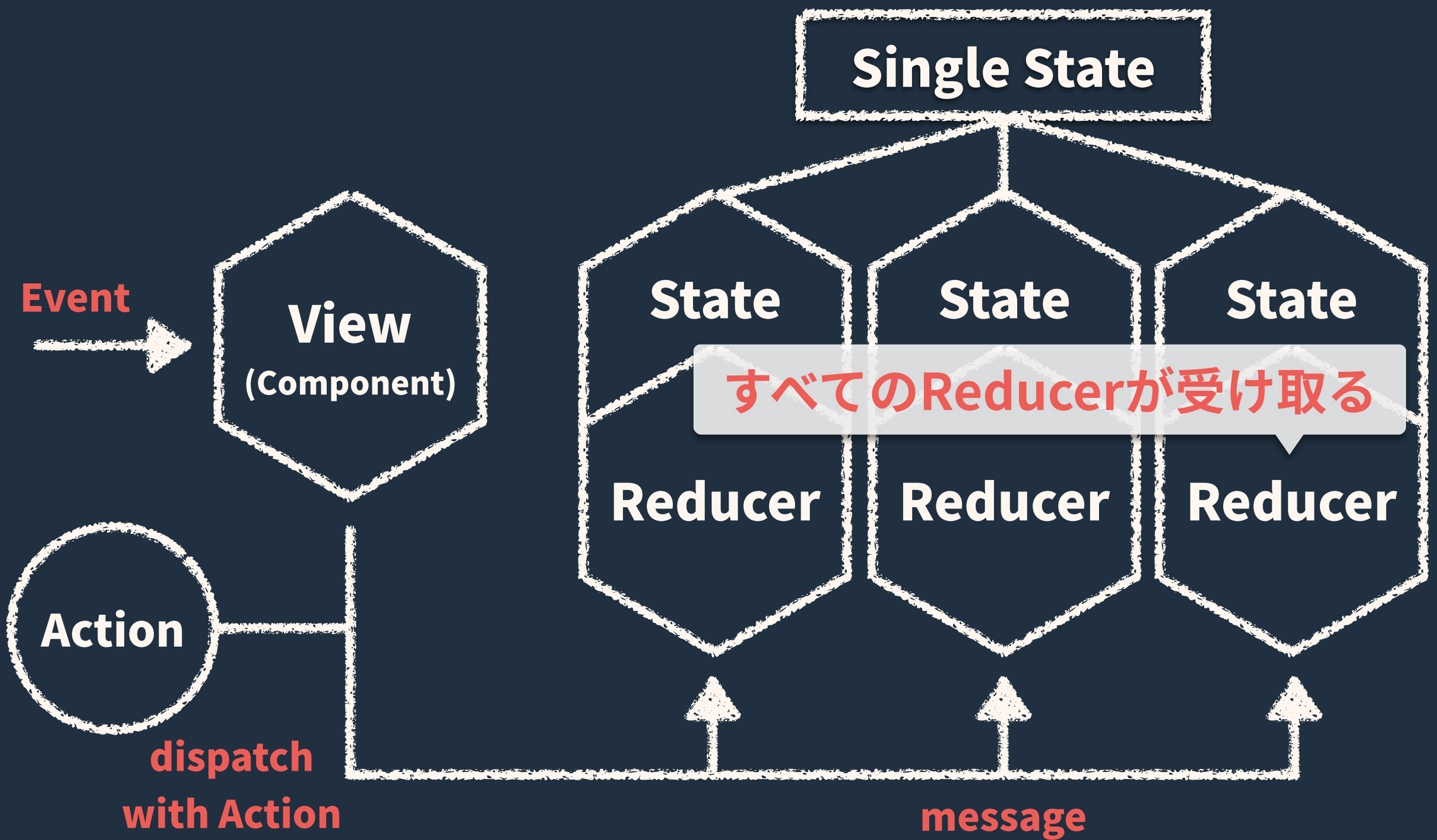
Data Flow


Single State
State
Reducer
State
Reducer
State
Reducer
Event
View
(Component)
Action
dispatch
with Action

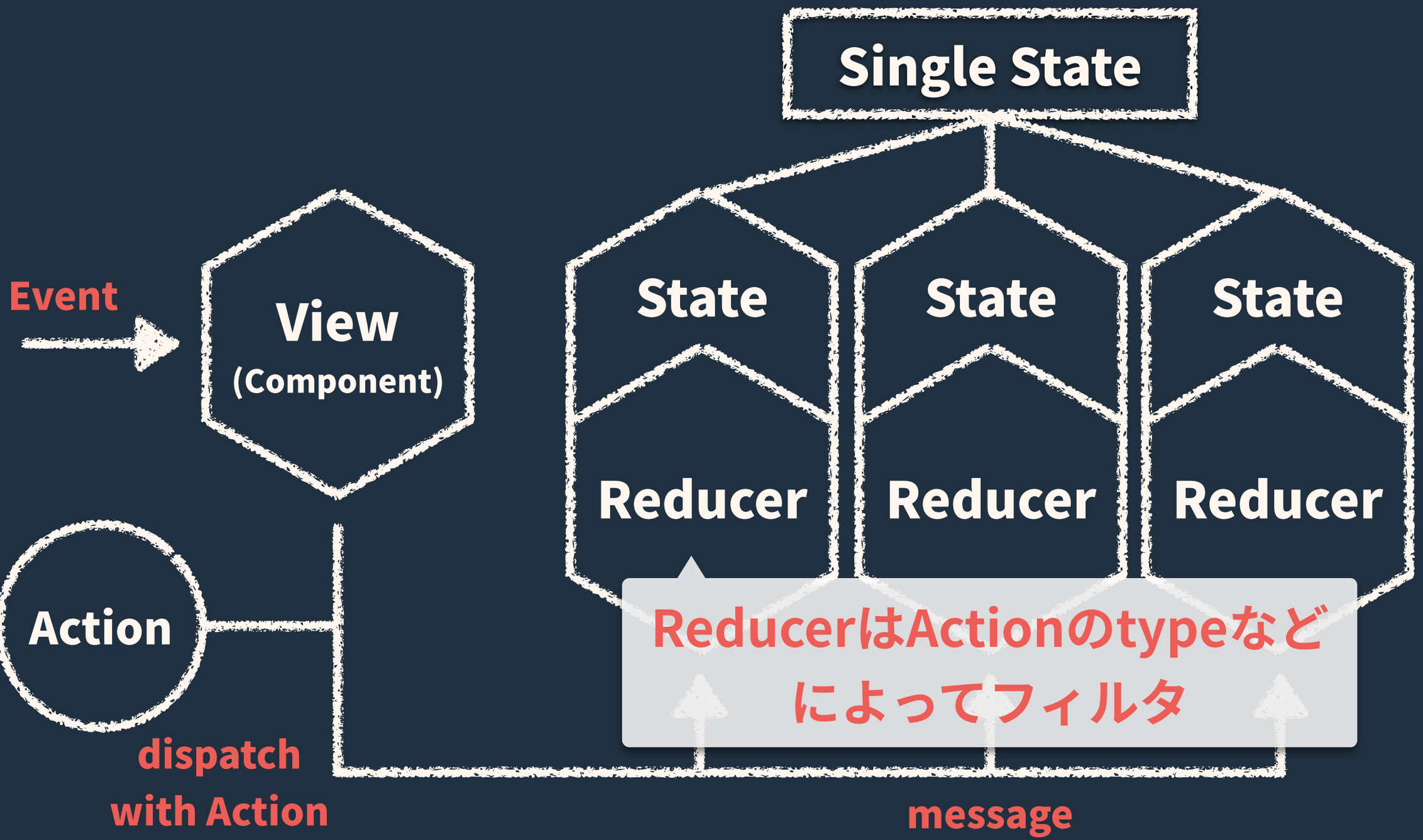
Data Flow


Single State
State
State
State
Reducer
Reducer
Reducer
Viewがdispatch
Event
View
(Component)
Action
dispatch
with Action
message

Data Flow


Single State
State
State
State
Reducer
Reducer
Reducer
すべてのReducerが受け取る
Event
View
(Component)
Action
dispatch
with Action
message

Data Flow


Single State
Event
View
(Component)
State
Reducer
State
Reducer
State
Reducer
Action
ReducerはActionのtypeなど
によってフィルタ
dispatch
with Action
message

Like this:

```
const initialState = { items: [] };

export const todo = (state = initialState, action) {
  switch (action.type) {
  case 'TOĐO_AĐĐ':
    return {
      items: state.items.concat(action.todo),
    };
  default:
    return state;
  }
};
```

Like this:

```
const initialState = { items: [] };

export const todo = (state = initialState, action) {
  switch (action.type) {
    case 'TODO_ADD':
      return {
        items: state.items.concat(action.todo),
      };
    default:
      return state;
  }
};
```

Reducer、メッセージを受け取ると呼ばれる

戻り値によって「更新後の値」を決める

引数と同じ参照を返すと「変更なし」

Like this:

```
const initialState = { items: [] };

export const todo = (state = initialState, action) {
  switch (action.type) {
  case 'TOĐO_AĐĐ':
    return {
      items: state.items.concat(action.todo),
    };
  default:
    return state;
  }
};
```

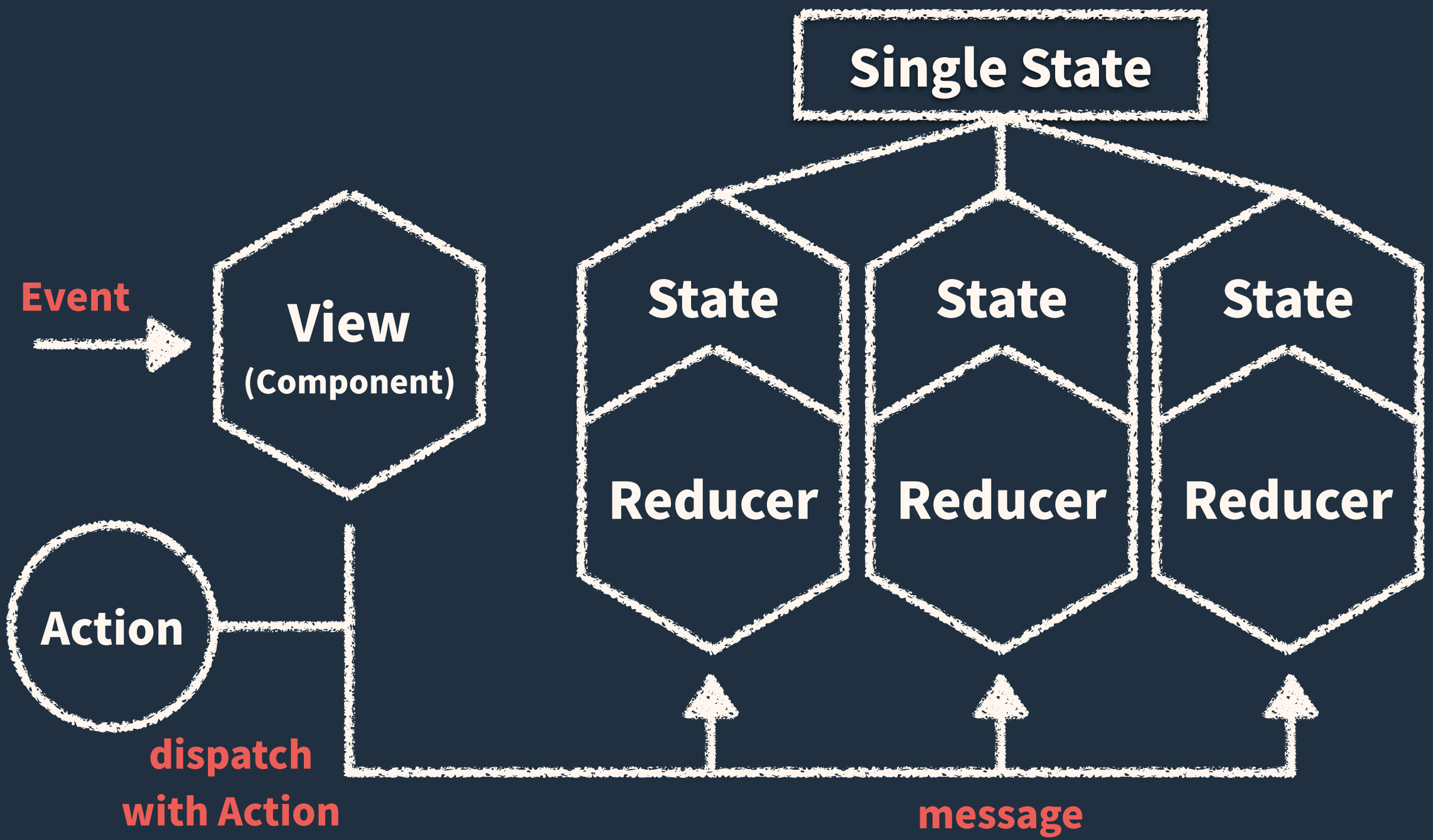
Stateの初期状態

Like this:

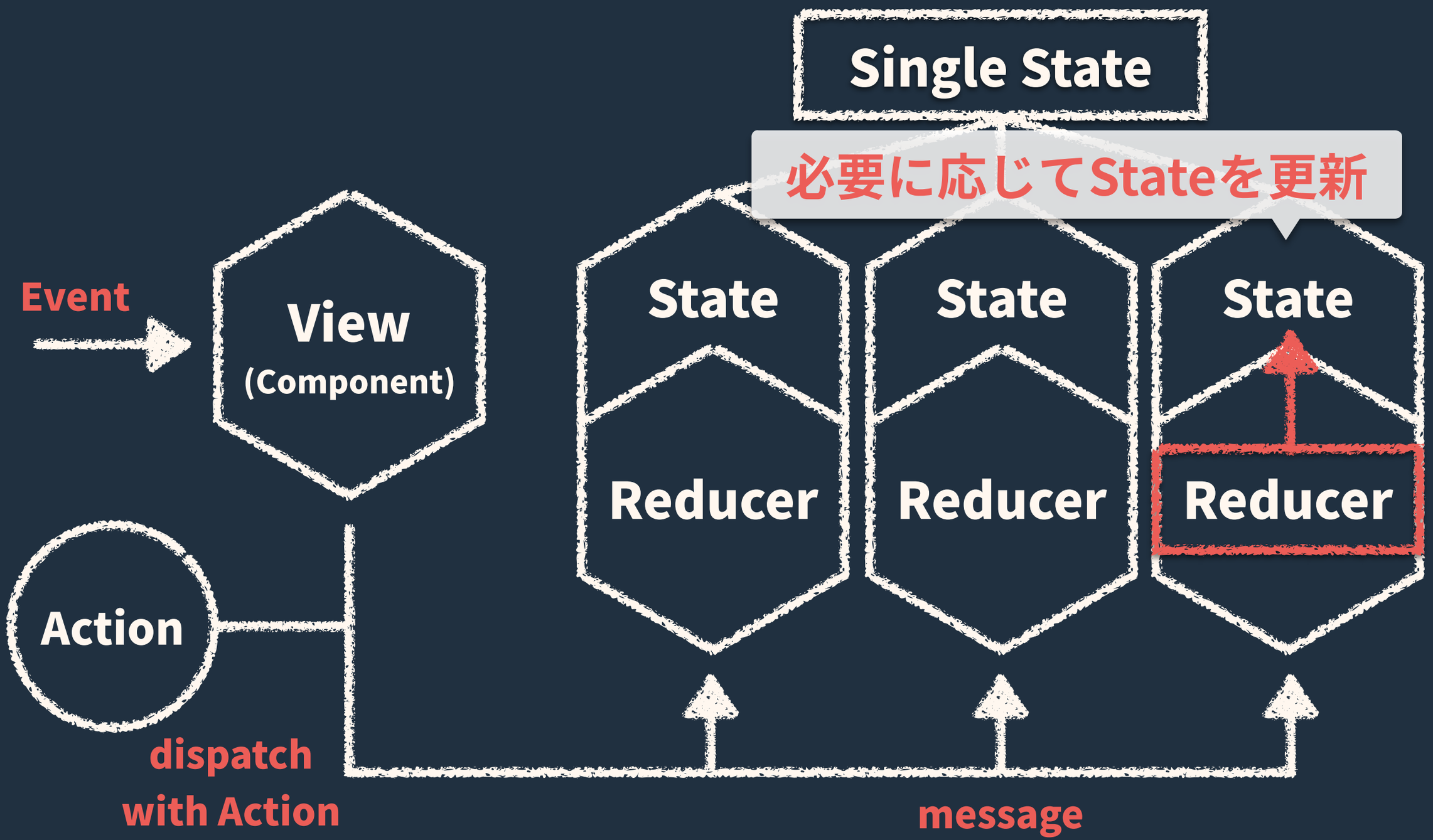
```
const initialState = { items: [] };

export const todo = (state = initialState, action) {
  switch (action.type) {
  case 'TOĐO_AĐĐ':
    return {
      items: state.items.concat(action.todo),
    };
  default:
    return state;
  }
};
```

Actionをフィルタリング

Data Flow

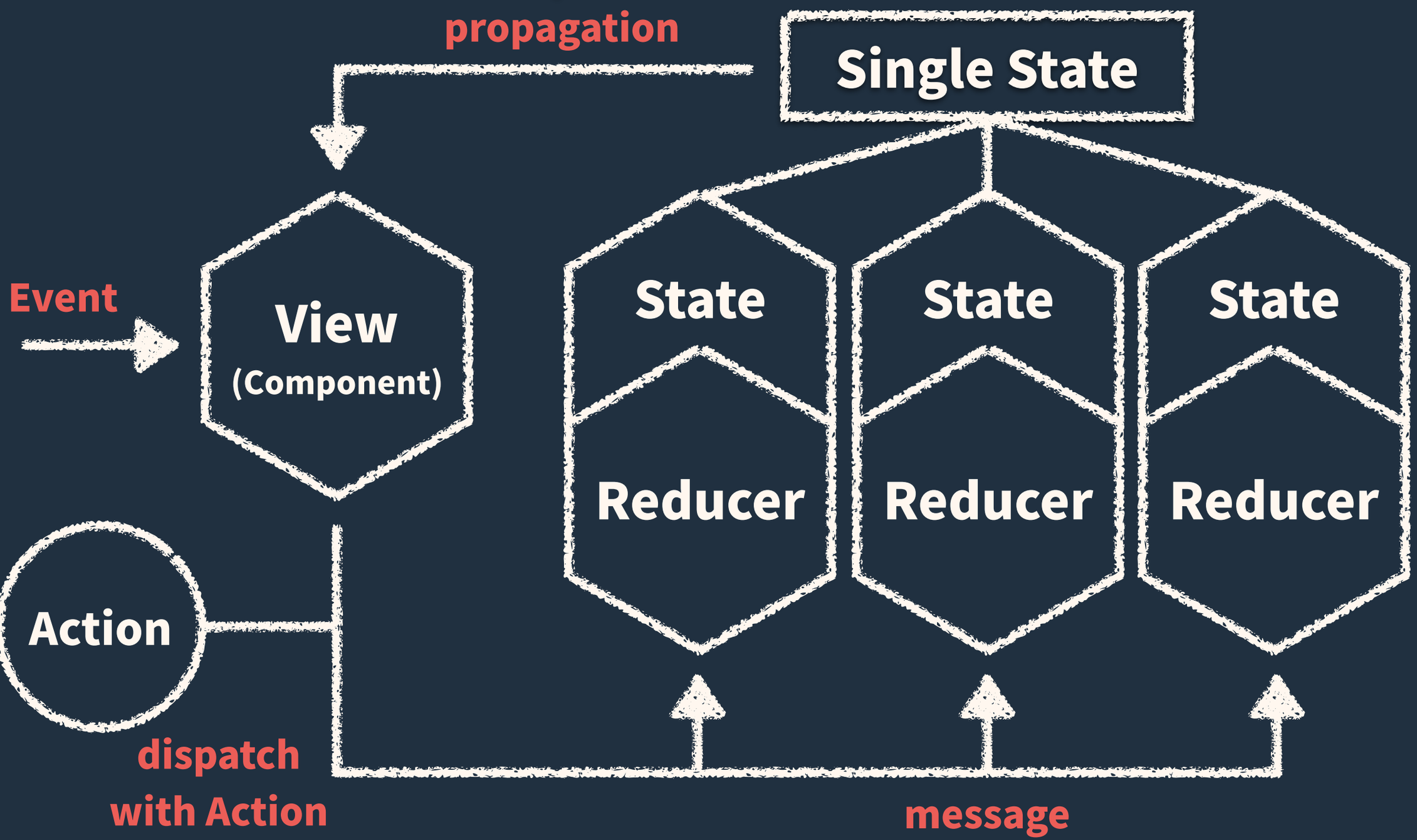

Single State
Event
View
(Component)
State
Reducer
State
Reducer
State
Reducer
Action
dispatch
with Action
message

Data Flow

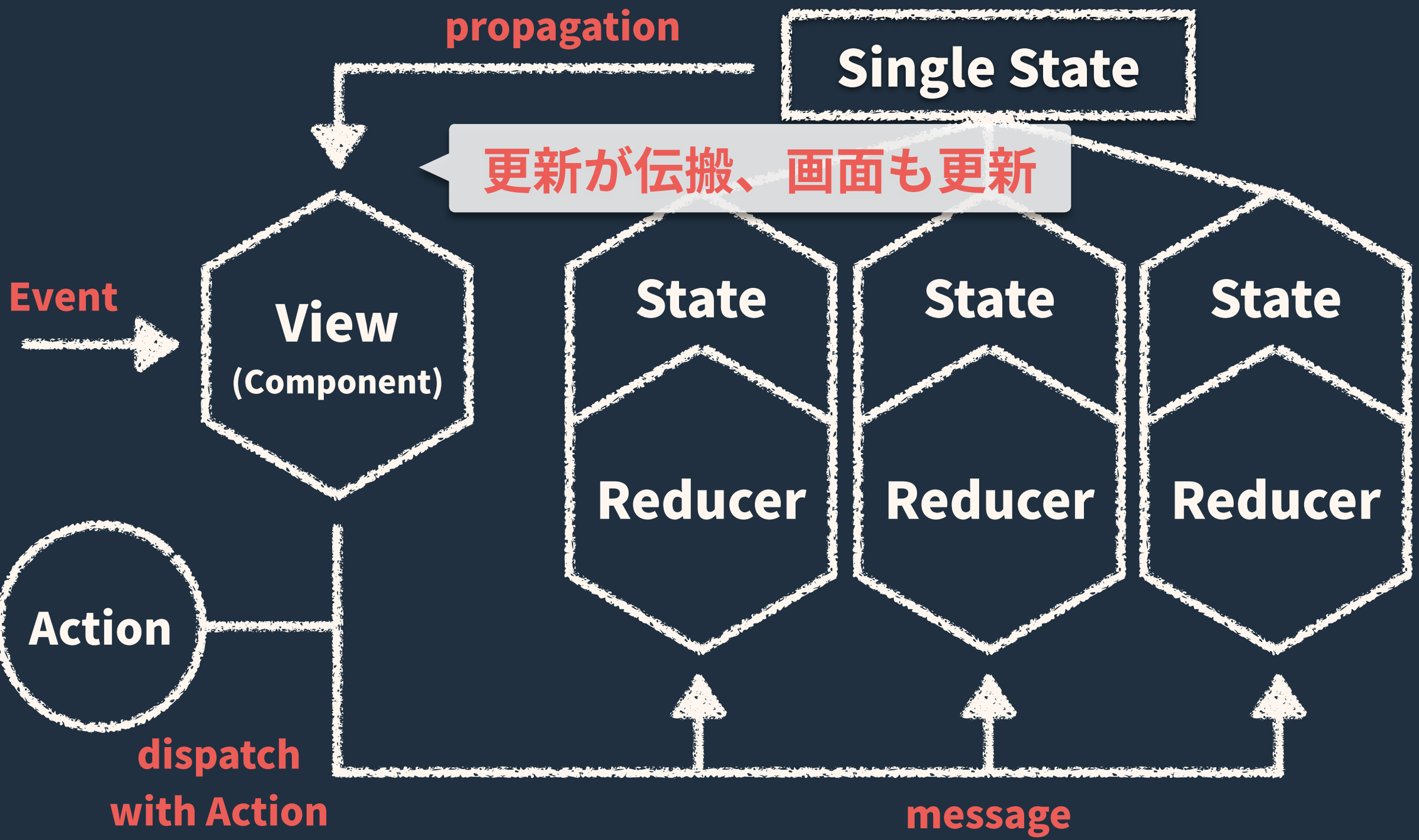

Single State
必要に応じてStateを更新
Event
View
(Component)
State
Reducer
State
Reducer
State
Reducer
Action
dispatch
with Action
message

Data Flow

ViewはStateを購読する



Data Flow

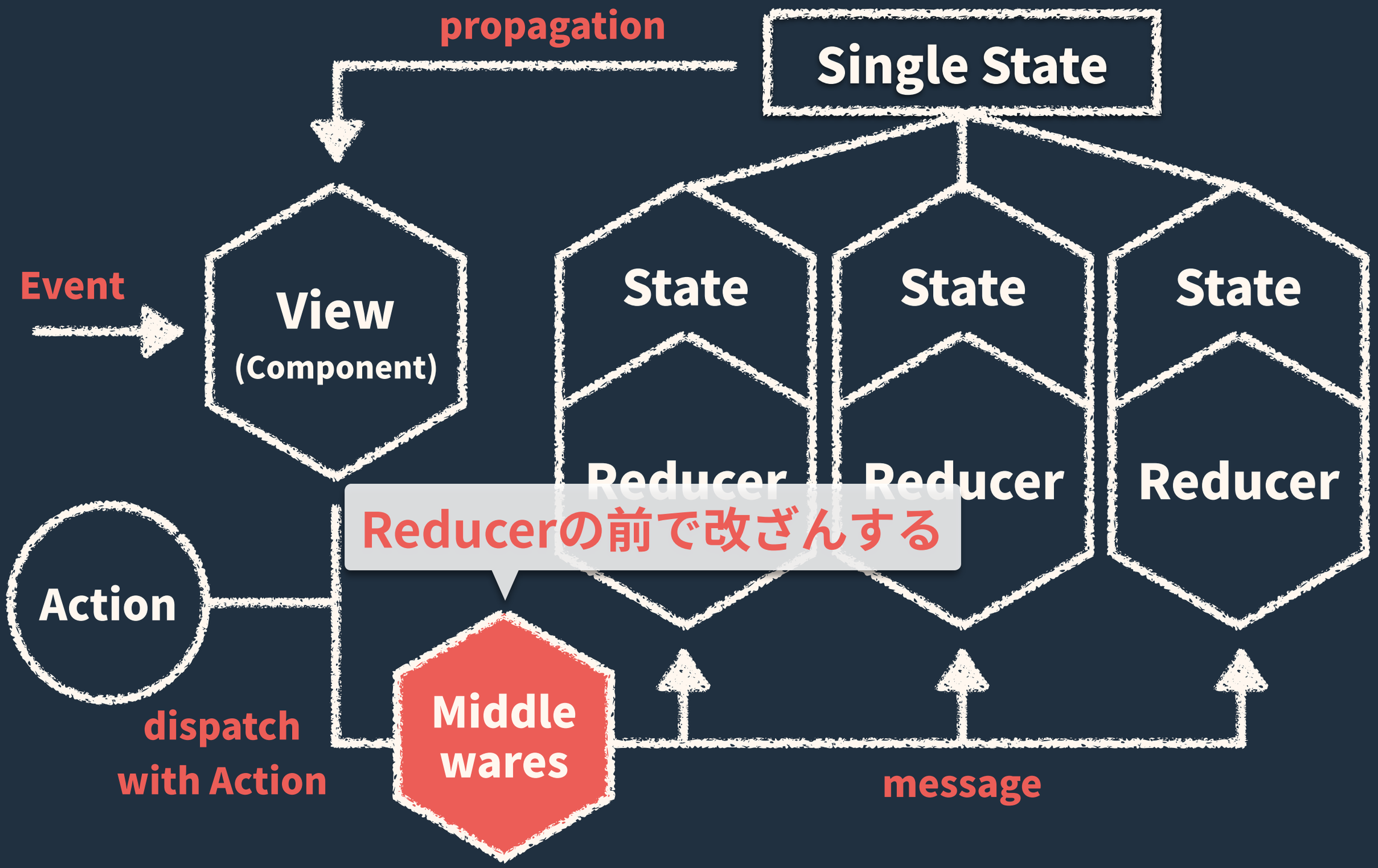

propagation
Single State
更新が伝搬、画面も更新
Event
View
(Component)
State
Reducer
State
Reducer
State
Reducer
Action
dispatch
with Action
message

Middlewares

Middlewares

- メッセージを伝搬途中で改ざんする機能
- 複数登録可
- イメージはNode.jsのConnectのそれに近い

Where are Middlewares?



Examples of Middlewares

- たとえばこんなことができる
    - 流れてくるメッセージをロギング
        - "redux-devtools"とか
    - ActionやReducerからCallbackを排除する
    - Google AnalyticsにEvent通知する　...etc

Logging each message

```
export const loggingMessage = store => {
  return next => {
    return action => {
      console.group(action.type);
      console.info(action);
      next(action);
      console.groupEnd(action.type);
    };
  };
};
```

本当はもうちょっと簡潔に書けるけど…

Logging each message

```
export const loggingMessage = store => {
  return next => {
    return action => {
      console.group(action.type);
      console.info(action);
      next(action);
      console.groupEnd(action.type);
    };
  };
};
```

流れてきたメッセージをそのままconsoleに

本当はもうちょっと簡潔に書けるけど…

Logging each message

```
export const loggingMessage = store => {
  return next => {
    return action => {
      console.group(action.type);
      console.info(action);
      next(action);
      console.groupEnd(action.type);
    };
  };
};
```

next()すると次のMiddleware
またはReducerに流れる

本当はもうちょっと簡潔に書けるけど…

Async convert to like a Sync

```
export const promiseSyncify = store => {
  return next => {
    return action => {
      if (!action.promise) return next(action);
      action.promise
        .then(value => next({ type: action.type, value }))
        .catch(err => {
          console.error(err);
          next({ type: action.type, value: null });
        });
    };
  };
};
```

Async convert to like a Sync

```
export const promiseSyncify = store => {
  return next => {
    return action => {
      if (!action.promise) return next(action);
      action.promise
        .then(value => next({ type: action.type, value }))
        .catch(err => {
          console.error(err);
          next({ type: action.type, value: null });
        });
    };
  };
};
```

action.promiseがなければスルー

Async convert to like a Sync

```
export const promiseSyncify = store => {
  return next => {
    return action => {
      if (!action.promise) return next(action);
      action.promise
        .then(value => next({ type: action.type, value }))
        .catch(err => {
          console.error(err);
          next({ type: action.type, value: null });
        });
    };
  };
};
```

Promiseを解決する

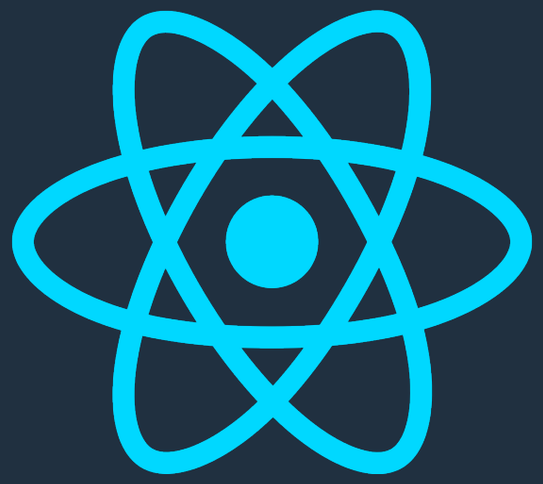
Async convert to like a Sync

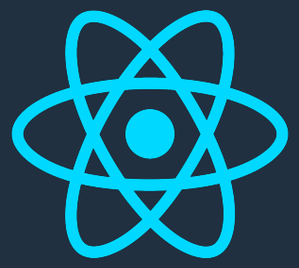
```
export const promiseSyncify = store => {
  return next => {
    return action => {
      if (!action.promise) return next(action);
      action.promise
        .then(value => next({ type: action.type, value }))
        .catch(err => {
          console.error(err);
          next({ type: action.type, value: null });
        });
    };
  };
};
```

nextして値を流す

各Reducerは流れてくる"value"を
同期的に処理すればよい

Using in the Real World

with 

with 

- Redux自体はReactがなくても動く
    - Reduxはただの状態コンテナにすぎない
        - “ng-redux"とかもある
- Reactとの併用には"react-redux"が便利

react-redux

- Reactバインディングを提供する
    - connect()
        - this.props経由で、指定したStateやdispatch()が得られる
            - subscribeの自動化
            - ComponentのFlux非依存化

Like this:

```
export const TodoList = React.createClass({
  onAddClick() {
    this.props.dispatch(/* any action */);
  },
  render() {
    // can access to this.props.todos
  },
});

export default connect(state => {
  return { todos: state.todos.items };
});
```

Like this:

```
export const TodoList = React.createClass({
  onAddClick() {
    this.props.dispatch(/* any action */);
  },
  render() {
    // can access to this.props.todos
  },
});

export default connect(state => {
  return { todos: state.todos.items };
});
```

connect()は
import { connect } from 'react-redux';
で得られる

Like this:

```
export const TodoList = React.createClass({
  onAddClick() {
    this.props.dispatch(/* any action */);
  },
  render() {
    // can access to this.props.todos
  },
});

export default connect(state => {
  return { todos: state.todos.items };
});
```

Single State Treeのルートが
コールバックで得られる

Like this:

```
export const TodoList = React.createClass({
  onAddClick() {
    this.props.dispatch(/* any action */);
  },
  render() {
    // can access to this.props.todos
  },
});

export default connect(state => {
  return { todos: state.todos.items };
});
```

Componentで必要なStateを
戻り値で指定する

Like this:

```
export const TodoList = React.createClass({
  onAddClick() {
    this.props.dispatch(/* any action */);
  },
  render() {
    // can access to this.props.todos
  },
});

export default connect(state => {
  return { todos: state.todos.items };
});
```

Stateはthis.props経由で得られる

Like this:

```
export const TodoList = React.createClass({
  onAddClick() {
    this.props.dispatch(/* any action */);
  },
  render() {
    // can access to this.props.todos
  },
});

export default connect(state => {
  return { todos: state.todos.items };
});
```

connect()すると自動的にdispatch()も得られる

Like this:

```
export const TodoList = React.createClass({
  onAddClick() {
    this.props.dispatch(/* any action */),
  },
  render() {
    // can access to this.props.todos
  },
});

export default connect(state => {
  return { todos: state.todos.items };
});
```

分けてexportすれば、元のComponentは
propsまでしか参照していないので

テストも楽

with React Router

with React Router

- 併用にはreact-router@1.0.0-beta2以降を
    - <Router> Componentが欲しいため
- 詳しく話すと長くなる上にコアな話なので、
  必要なら懇親会で聞いてください
- または @axross_ on Twitterまで

Conclusion

Conclusion

- 現状、我々のもっとも大きな悩みは状態管理
    - 複雑さは上昇傾向にある
    - React/Fluxで100%解決されてはいない
    - そろそろ状態管理について向き合おう
- Reduxは「状態管理」に重きを置いたFlux

Conclusion

- Single State Tree
    - 1つの状態ツリーでアプリケーション全体を
    - モックを注入し、即座に再現が可能

Conclusion

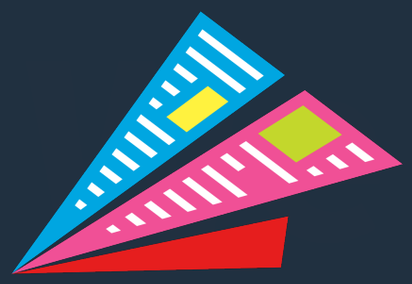
- Data Flow
    - Actionは本当に「ただの関数」
    - Reducerも単純なフィルター/マッパー
    - どこで値が生成され、どのように流れていったのか、容易に辿ることができる

Conclusion

- Middlewaresがある
    - すべてのメッセージの改ざんが可能
    - ロギング
    - 非同期を同期処理っぽく扱う
    - 認証が済んでるかどうかの確認なども

Redux is really great!

Thank you for listening :)



want Front-end Engineers!