

Macoun

Moderne App Architektur

Thomas Wolters

Thomas Wolters

- Entwickler seit mehr als 20 Jahren
- iOS 4
- Mehr als 40 Apps
- Twitter: @thomaswolters

fluidmobile

fluidmobile

- 25 Apps
- Verschiedene Branchen
- Online-Only, Offline-First, Offline

Verwendete Architekturen

- MVC
- VIPER
- VMVMCVMVCM...

Vision: Slider

Anforderungen

- Slider um vor und zurück zu spulen
- Daten und Views passen sich automatisch an

Opensource

- SourceCode
- Präsentation
- Kein Framework!

Apple UI Restoration ⇧

UI Restoration Process

- iOS 6
- WWDC 2012

Activate Restoration

```
//AppDelegate
-(BOOL) application:(UIApplication *)application
shouldSaveApplicationState:(NSCoder *)coder{
    return YES;
}

- (BOOL) application:(UIApplication *)application
shouldRestoreApplicationState:(NSCoder *)coder{
    //version check if state invalid due e.g. appUpdate
    return YES;
}
```

Move RootView

```
//AppDelegate

- (BOOL)application:(UIApplication *)application
willFinishLaunchingWithOptions:(NSDictionary *)launchOptions {

//setup RootViewController

[self.window makeKeyAndVisible];
    return YES;
}
```

Setup Identifier

```
//init ViewController  
self.restorationIdentifier = @"Foo";
```

encode/decode State

```
//ViewController

-(void)encodeRestorableStateWithCoder:(NSCoder *)coder{
    [coder encodeObject:self.attribute forKey:@"key"];
    [super encodeRestorableStateWithCoder:coder];
}

-(void)decodeRestorableStateWithCoder:(NSCoder *)coder{
    self.index = [coder decodeObjectForKey:@"key"];
    self.attribute = [[coder decodeObjectForKey:@"key"] boolValue];
}
```

Testen

- Xcode
- App

Nutzen

- Komplexere Callbacks AppDelegate
- iOS baut die komplette view Hierarchie intern
- Apple benutzt es noch selber
- Viel besser als nichts zu unternehmen.

App Store Top App Research



- Apple Clock
- Apple Mail
- Apple Messages
- Babbel
- Castro 2
- Runnmeter Running
- Things 3
- Trials
- Ulysses
- WhatsApp



- Amazon
- Apple Settings
- Bring
- Chefkoch
- DB Navigator
- Duolingo
- immoScout
- Immowelt
- Katwarn
- mobile.de
- Netflix
- Oje ich wachse
- ParcelTrack
- pizza.de
- Sorted 3
- Tripadvisor

Sonderfall State Restoration?

iOS System Memory

- 1 GB iPhone 5s, iPhone 6
- 2 GB iPhone SE
- 3 GB iPhone X
- 4 GB iPhone Xs

State

State

- Model
- View
- Services
- System

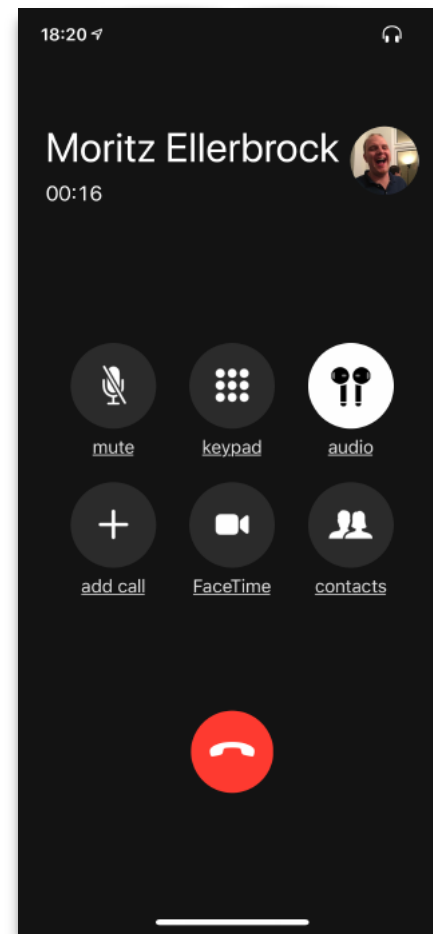
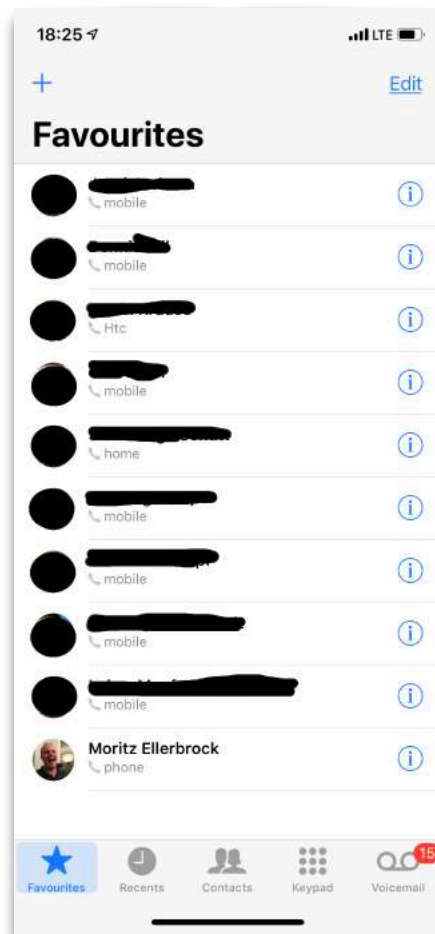
ViewState

ViewState

- Hierarchie
- Model References
- ScrollPosition
- TextfieldInputs

Apple Phone App

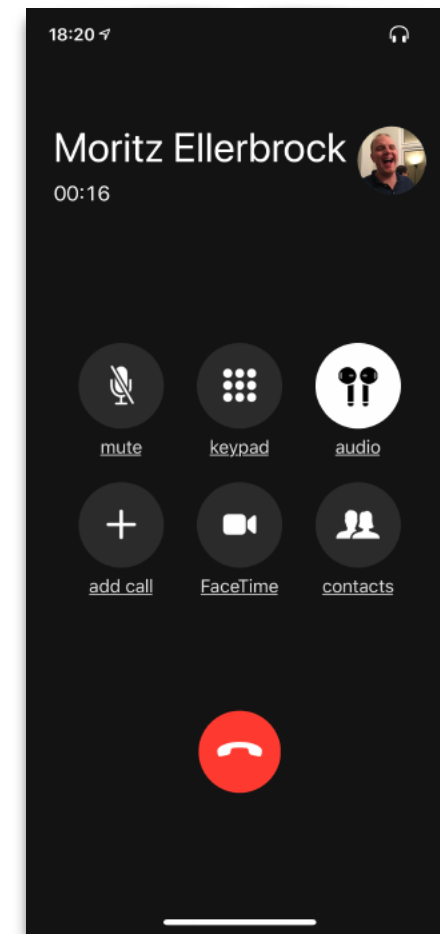
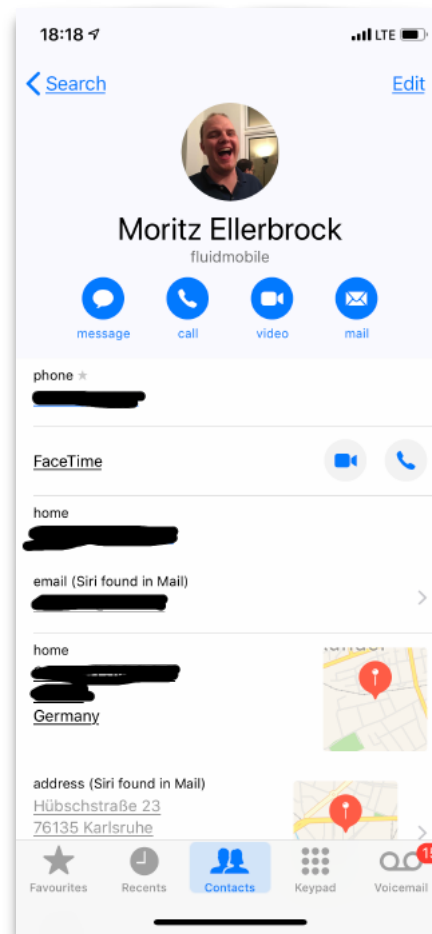
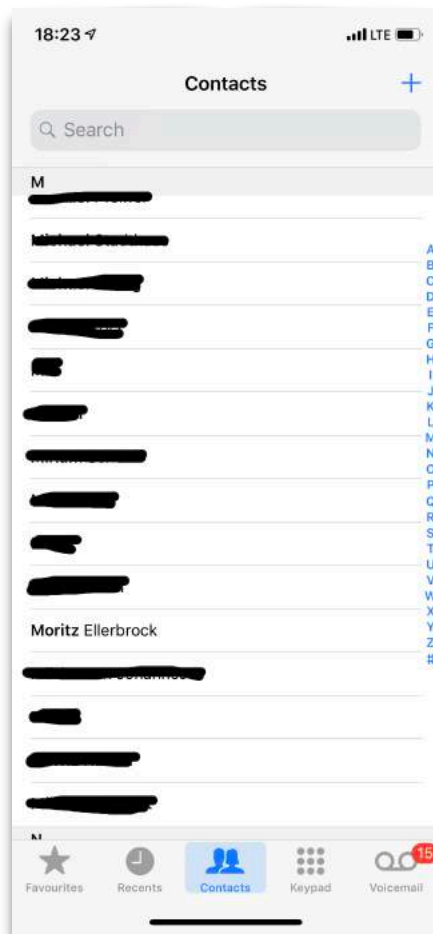
VS: Favorite > Running Call



VS: Favorite > Running Call

```
"selectedTab": 0,  
"favorite": [{  
  "selectedIndex": 9  
}],  
"contact": [{}],  
"call": {  
  "contactNumberRef": "e0bbbc13f53",  
  "status": "running",  
  "durationSeconds": 16  
},  
"keypad": {}
```

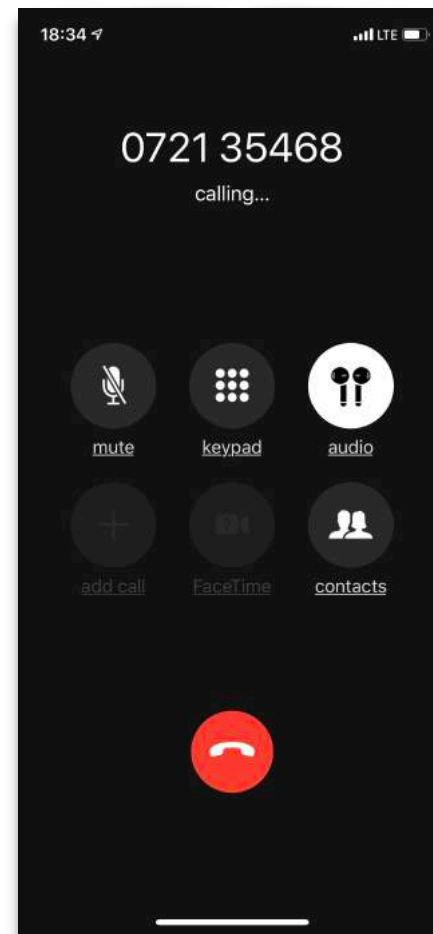
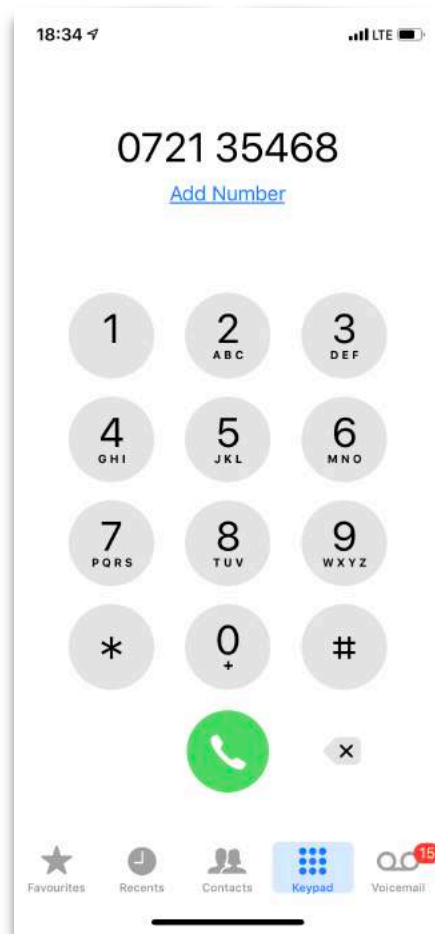
VS: Contacts > Running Call



VS: Contact > Running Call

```
"selectedTab": 2,  
"favorite": [{}],  
"contact": [{  
  "selectedIndex": 234  
}, {  
  "contactRef": "58f15d5e"  
}],  
"call": {  
  "contactNumberRef": "e0bbbc13f53",  
  "status": "running",  
  "durationSeconds": 16  
},  
"keypad": {}
```

VS: Keypad > Running Call



VS: Keypad > Running Call

```
"selectedTab": 3,  
"favorite": [{}],  
"contact": [{}],  
"call": {  
  "contactNumberRef": "ddde857a4eb2",  
  "status": "calling",  
  "durationSeconds": 0  
},  
"keypad": {  
  "numberInput": "0721 35468"  
}
```


Slider

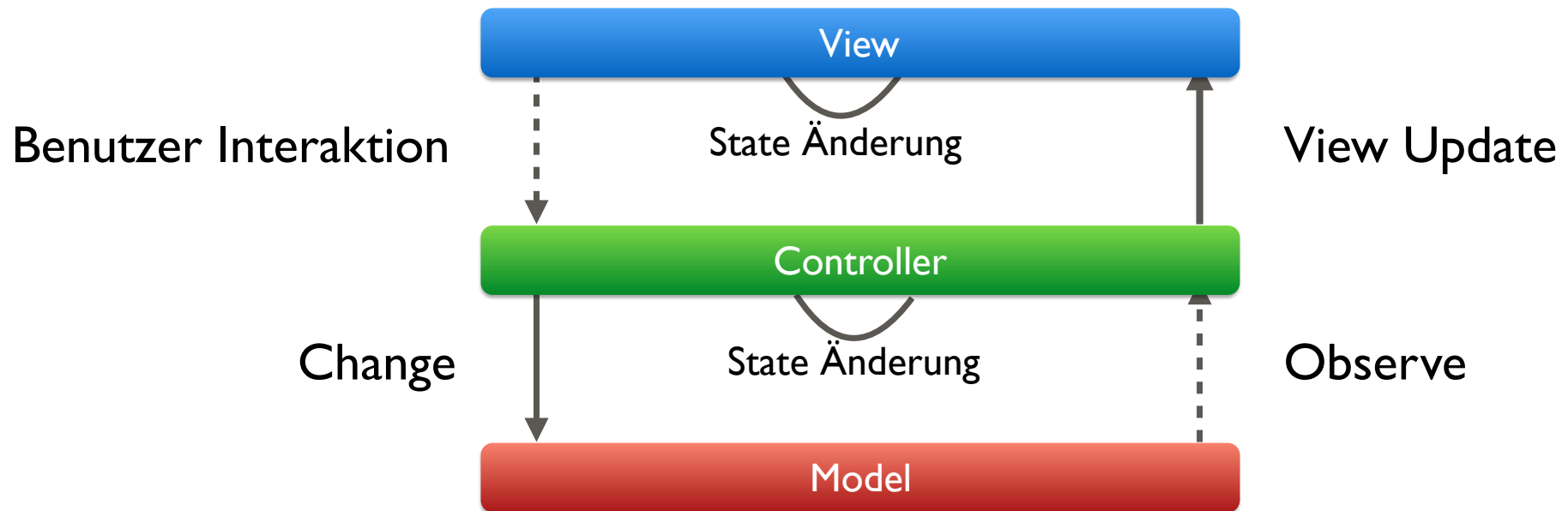
- Jede Änderung ein neuer ViewState der App

MVC

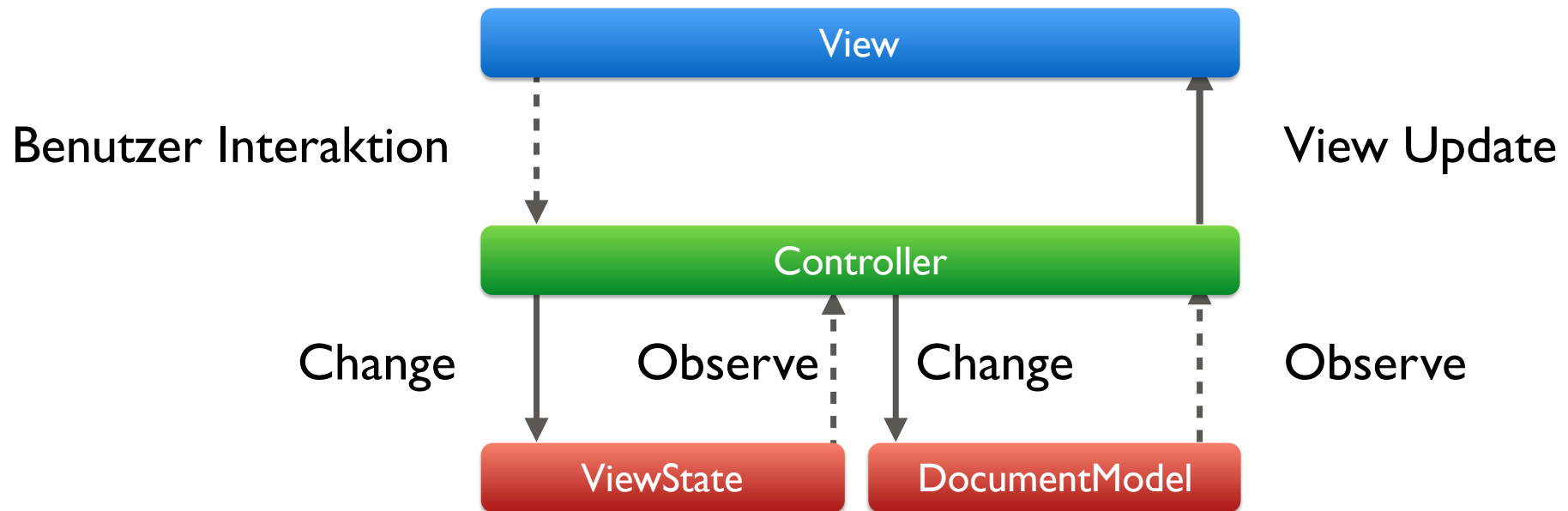
Geschichte

- 1979
- Dokumentenbasierte Software

MVC



MVC



DocumentModel

Document Model

- DB
- Txt-File
- userDefaults

EventStore

Was sind Events

- Veränderungen des DocumentModels
- Attribut Änderung sein
- Oder auch stark veränderte Struktur
- Cmd-Z - Prinzip

Aufbau eines Events

- Achtung: anwendungsspezifisch, keine Überabstraktion!!

```
{
  "identifier": "create_contact",
  "changes": {
    "contact_name": "Thomas Wolters",
    "twitter": "thomaswolters"
  },
  "modelReference": 42,
  "reverseEvent": {
    "identifier": "delete_contact",
    "modelReference": 42
  }
}
```

EventStore

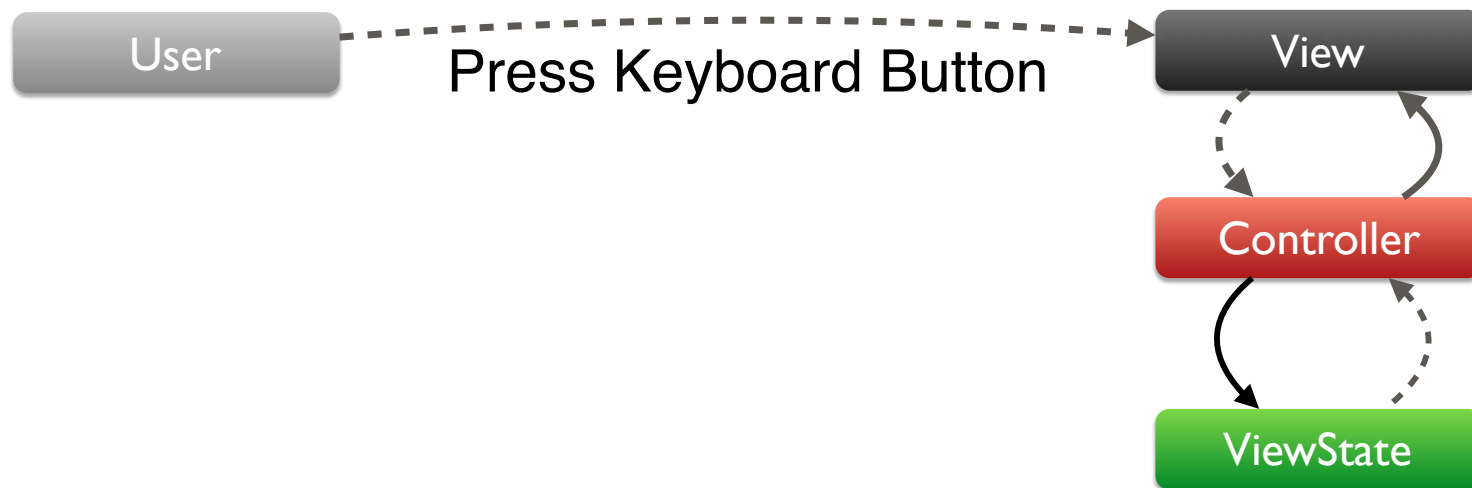
- Speichert Events
- Verschied den EventIndex
- Verändert das ReadModel

Readmodel

- Datenbank, oder Objekte im Speicher
- Alle Events ausgeführt
- Ziel Schnelles lesen, kein Bottleneck

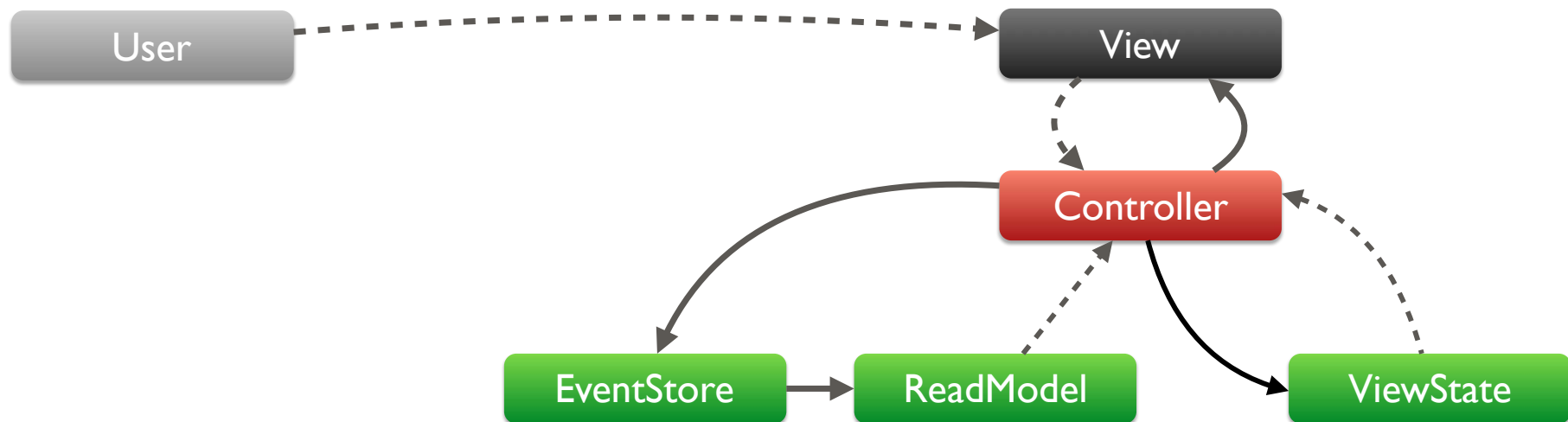
Keyboard Input

- Nutzer Wählt Kontakt -> “Bearbeiten” -> Textfeld “Name”



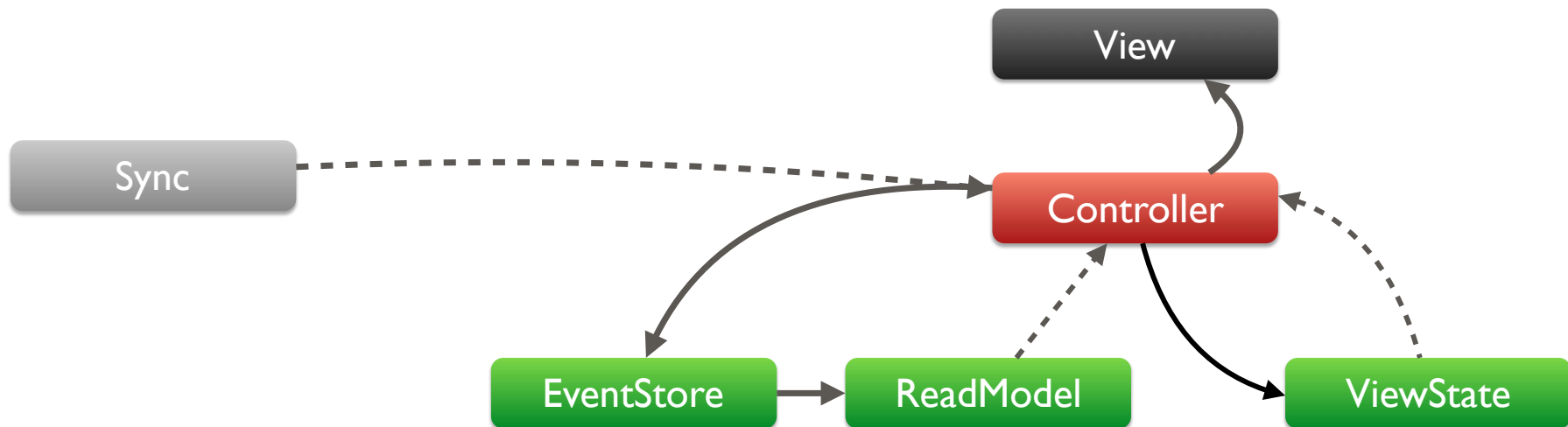
Keyboard Contact Delete

- Nutzer Wählt Kontakt -> “Bearbeiten” -> “Kontakt löschen”



Keyboard Contact Delete

- Sync löscht Kontakt



Sample Project: Magic Slider

App Usecases

- Proof-Of-Concept:
 - Ordner Liste
 - Unterordner

App

Root

[rename](#) [new](#)

ordner 1

FileCount:1 Path:Root

ordner 2

FileCount:0 Path:Root

Event: Ordner erstellen

< Backordner 1rename new

Unterordner in order 1
FileCount:0 Path:Root\ordner 1

new folder

insert in Path: Root\ordner 1

cancel

create

Event: Ordner erstellen

```
{
  "id" : "folder.create",
  "changes" : {
    "title" : "ordner 1"
  },
  "uuidPath" : "5fe01be9.dcf65cf5",
  "reverseEvent" : {
    "id" : "folder.delete",
    "uuidPath" : "5fe01be9.dcf65cf5"
  }
}
```

Event: Rename

< Backordner 1rename new

Unterordner in order 1
FileCount:0 Path:Root\ordner 1

rename
rename

cancelrename

Event: Rename

```
{
  "id" : "file.rename",
  "changes" : {
    "title" : "ordner 1 max"
  },
  "uuidPath" : "5fe01be9.dcb82da4",
  "reverseEvent" : {
    "id" : "file.rename",
    "changes" : {
      "title" : "ordner 1"
    },
    "uuidPath" : "5fe01be9.dcb82da4"
  }
}
```

Event: Delete folder(subfolder)

Root		rename	new
1	Path:Root	delete	
ordner 2	FileCount:0 Path:Root		

```
{
  "id" : "file.delete",
  "uuidPath" : "5fe01be9.dcb82da4",
  "reverseEvent" : {
    "id" : "bundle",
    "childEvents" : [{
      "id" : "folder.create",
      "changes" : {
        "title" : "ordner 1"
      },
      "uuidPath" : "5fe01be9.dcb82da4"
    }, {
      "id" : "folder.create",
      "changes" : {
        "title" : "unterordner in ordner 1"
      },
      "uuidPath" : "5fe01be9.575d18fb"
    }
  ]
}
```


ViewState

- ✓ Push ViewController
- ✓ Pop ViewController
- ✓ ScrollPositionFolderList
- ✗ showAlert
- ✗ alertInputChange
- ✗ alertDismiss

ViewStates

```
{
  "folder" : [
    {
      "uuidPath" : "6cb1211c",
      "selectedIndex" : 17
    },
    {
      "uuidPath" : "6cb1211c.ae984e21"
    }
  ]
}
```

View Store Restoration

Activate Restoration

```
-(BOOL)application:(UIApplication *)application
willFinishLaunchingWithOptions:(NSDictionary *)launchOptions{
    //init window, eventStore, ViewStateStore, SnapshotStore

    self.context = [[StoreContext alloc] initWithEventStore:es
viewStateStore:vss snapshotStore:sss];

    FolderNavigationController* navigationController; //init
[navigationController setContext:self.context];

    self.window.rootViewController = navigationController;
    [_window makeKeyAndVisible];
    return YES;
}
```

Load ViewState

```
//FolderNavigationController viewDidLoad
self.observations = [self.storeContext.viewStateStore
observationsForAction:ActionPushFolder viewChange:^(Action action, ViewState*
state){
    weakSelf.viewState = state;
    switch (action) {
        case ActionReload:{
            NSMutableArray* folderViewControllers = [@[ ] mutableCopy];
            for (int i = 0; i < state.viewStateFolders.count; i++){
                [folderViewControllers addObject:[self folderVCForIndex:i]];
            }
            weakSelf.viewControllers = folderViewControllers;
        } break;
        case ActionPushFolder:{
            long nextIndex = state.viewStateFolders.count -1;
            FolderViewController* vc = [self folderVCForIndex:nextIndex];
            [weakSelf pushViewController:vc animated:YES];
        } break;
    }
}
```

Live Demo

Neben dem Slider bekommen
wir nebenbei:

Möglichkeiten dieser Architektur

- Command - Z
- Deeplinking
- State Restoration, IMMERS
- Offline first

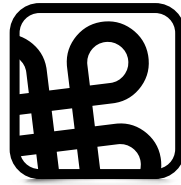
Fazit

Fazit: ViewState + Events

- Planung und anspruchsvollere Entwicklung
- Deeplink und Cmd-Z
- Nutzen für Integrationstests
- Debugging Möglichkeiten > Aufwendige Programmierung

Fragen?

Vielen Dank



Macoun