

Application Development for Mobile and Ubiquitous Computing

# MENSA 2.0

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## Idea

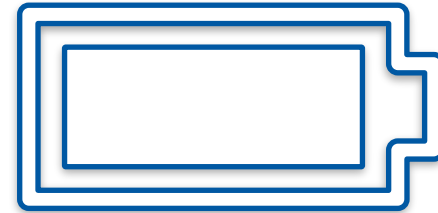
- Images of the meal (also on iOS)
- Get all available Data (more than what is provided by OpenMensa)
- Allergy filtering
- Favorite meal alert
- high loading Speed + good usability
- Offline check



## Challenges



Connectivity &  
Offline



Energy

## Connectivity & Offline

- Caching whenever possible
- Load most important informations first
- Load data for two weeks in advance
- Push-Notifications available even if user is offline (for two weeks max.)



## Connectivity & Offline: Adaptation

- Reduction: prioritized data transfer
- message delivery: Using cached data
- Transformation: Different display of data



## Connectivity & Offline: Adaptation

- Detection via the NetInfo package
- Can differentiate between Wifi, none, cellular and 2g, 3g and 4g
- Based on GraphQL, we can change the amount of data received
- If slow connection exists (slower than 2g), we do not load Pictures (strong data reduction)
- No Background-job on cellular, only Wifi
- Change appearance of Card (next slide)

```

if (this.props.source !== nextProps.source) {
  this.checkInternetConnection()
}
}


checkInternetConnection = () => {
  NetInfo.getConnectionInfo().then(connectionInfo => {
    let goodConnection = false
    if (connectionInfo.type === 'wifi') {
      goodConnection = true
    } else if (
      connectionInfo.type === 'cellular' &&
      ['3g', '4g'].includes(connectionInfo.effectiveType)
    ) {
      goodConnection = true
    }

    this.setState({
      goodConnection
    })
  })
}

render() {
  const { source } = this.props
  const { goodConnection } = this.state

```

## Adaption based on Connection & Informations



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Ausgabe rechts

Gemüsebällchen mit Chili-Lauchsoße, dazu glasierte Honigmöhren und Kokosreis

Studierende 2,65€ Bedienstete 4,35€

Online & Full Data

Abendangebot

Abendangebot:  
Bratkartoffelpfanne mit Kassler  
und Gemüse oder Bratkartoffeln  
mit Tomate und Mozzarella, dazu  
bunter Chinakohlsalat

Studierende 2,65€

Bedienstete 4,35€

Offline (cached Data)  
or no more available Data

## Energy

- Minimizing data traffic by using GraphQL and Caching
- No long-running background tasks
- Push-Notifications locally, no need for Push-Server





## Energy: Adaptation

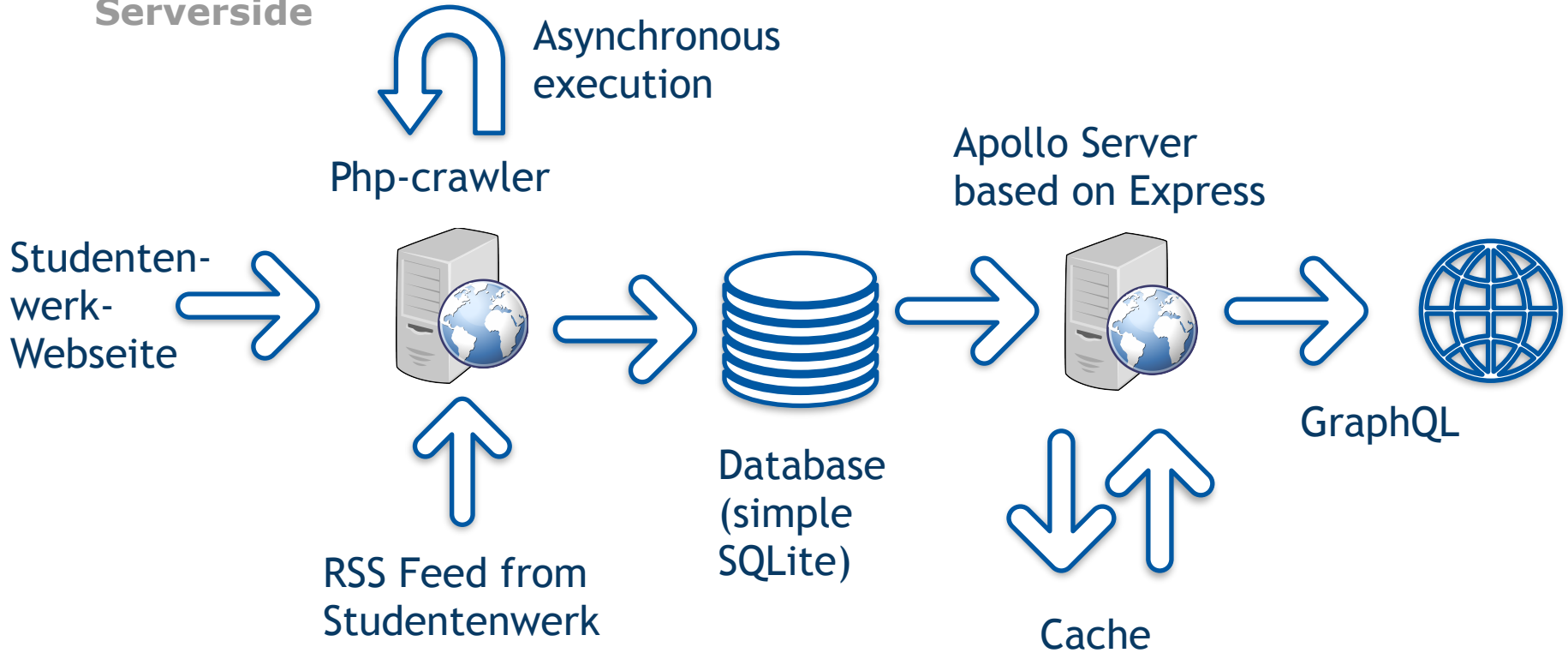
- using the react-native-battery-status package
- detect battery status in percent
- If battery is low, pause background-jobs
  - do not load meal-images
  - Adaptation like before
  - only take data from cache



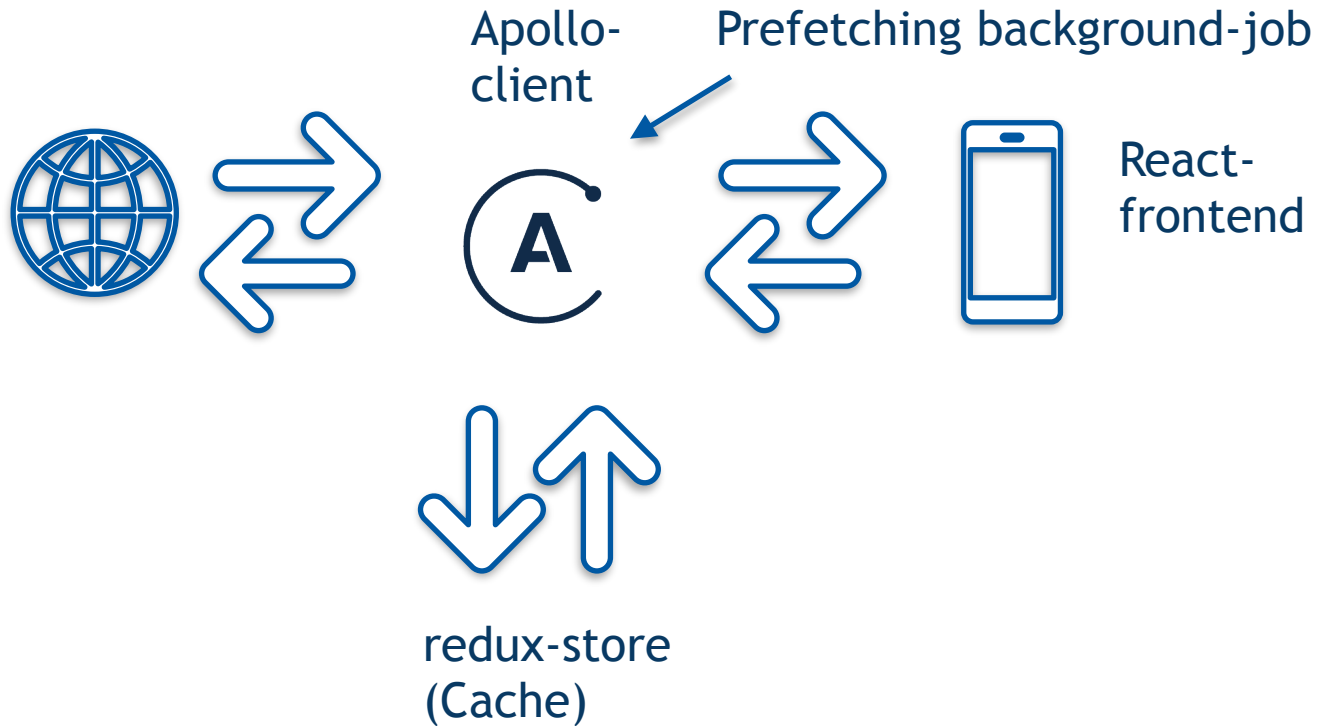
## Technical Implementation




## Serverside



## Clientside



## GraphQL: Status

```
GraphQL  Prettify History

1 {
2   mensen {
3     name
4     menu(day: "2017-12-07") {
5       day
6       meals {
7         title
8         studentPrice
9         URL
10        image {
11          URL
12          author
13        }
14        type
15        counter
16        informations
17        furtherNotes
18        additives {
19          numberCode,
20          description
21        }
22        allergens {
23          numberCode,
24          description
25        }
26      }
27    }
28  }
29 }
```

```
{
  "data": {
    "mensen": [
      {
        "name": "Alte Mensa",
        "menu": {
          "day": "2017-12-07",
          "meals": [
            {
              "title": "Sojabällchen mit Tomaten-Zucchini-ragout und Vollkornreis",
              "studentPrice": 2.1,
              "URL": "https://www.studentenwerk-dresden.de/mensen/speiseplan/details-196280.html?pn=27",
              "image": {
                "URL": "https://www.studentenwerk-dresden.de/mensen/speiseplan/details-196280.html?pn=27",
                "author": "Studentenwerk Dresden",
                "type": null,
                "counter": null,
                "informations": [
                  {
                    "numberCode": "V",
                    "description": "Menü ist vegetarisch",
                    "enthält Knoblauch": true
                  }
                ],
                "furtherNotes": null,
                "additives": [
                  {
                    "numberCode": "2",
                    "description": "mit Konservierungsstoff"
                  }
                ],
                "allergens": [
                  {
                    "numberCode": "A",
                    "description": "Glutenhaltiges Getreide"
                  },
                  {
                    "numberCode": "A1",
                    "description": "Weizen"
                  },
                  {
                    "numberCode": "C",
                    "description": "Eier"
                  },
                  {
                    "numberCode": "F",
                    "description": "Soja"
                  },
                  {
                    "numberCode": "I",
                    "description": "Sellerie"
                  }
                ]
              }
            }
          ]
        }
      },
      {
        "name": "Zeltschlößchen",
        "menu": {
          "day": "2017-12-07",
          "meals": [
            {
              "title": "Zeltschlößchen",
              "studentPrice": 2.1,
              "URL": "https://www.studentenwerk-dresden.de/mensen/speiseplan/details-196280.html?pn=27",
              "image": {
                "URL": "https://www.studentenwerk-dresden.de/mensen/speiseplan/details-196280.html?pn=27",
                "author": "Studentenwerk Dresden",
                "type": null,
                "counter": null,
                "informations": [
                  {
                    "numberCode": "V",
                    "description": "Menü ist vegetarisch",
                    "enthält Knoblauch": true
                  }
                ],
                "furtherNotes": null,
                "additives": [
                  {
                    "numberCode": "2",
                    "description": "mit Konservierungsstoff"
                  }
                ],
                "allergens": [
                  {
                    "numberCode": "A",
                    "description": "Glutenhaltiges Getreide"
                  },
                  {
                    "numberCode": "A1",
                    "description": "Weizen"
                  },
                  {
                    "numberCode": "C",
                    "description": "Eier"
                  },
                  {
                    "numberCode": "F",
                    "description": "Soja"
                  },
                  {
                    "numberCode": "I",
                    "description": "Sellerie"
                  }
                ]
              }
            }
          ]
        }
      }
    ]
  }
}
```

## Current Status

