Application Development for Mobile and Ubiquitous Computing

SuperSync
Access your data anywhere

Second Presentation - Context Adaptation
Dresden, December 13th 2019

SuperSync – What it is about

- Android App

- Integrated FileExplorer

- Background synchronization of data based on
  - Connection Availablilty
  - Connection Properties
  - Battery Status
- Cached data
  - Always accessible

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Context Layer

NetworkCapabilities

- Online/offline status
- Upload & download speeds
  - Slow WiFi, busy LTE cell slower than 3G
- Metered/unmetered connectivity
  - Cruise ship WiFi vs unlimited data plan

Battery Receiver

- System broadcast if phone alternates between normal and low battery
- Battery Percentage readout

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Offline Challenge

Online

- Polling enabled
- Work on queue
  - add files according to settings
  - upload/download files/folders

Offline

- Polling disabled
- Work on queue
  - add local files according to settings
  - no uploads/downloads initiated

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Connectivity Challenge

Fast and unmetered connection

- Synchronize queued data
- Update file if user accesses outdated local version
    - unless file is too big (filesize/networkspeed)

Slow or metered connection

- No background synchronization
- User accesses outdated local file, offer
    - cached version or
    - update file anyway

Checking if a connection is metered can be disabled by user.

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Battery Challenge

Normal battery status

- Regular polling

- Background synchronization

- Update file on access if possible

Low battery status

- No polling

- No background synchronization

- Don't update files on access

- User can manually force all those functionalities

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Background WorkManager

- Part of Android Jetpack

- Enables to specify Background Tasks
    + set Constraints supporting
            Offline Challenge
            Connectivity Challenge
            Battery Challenge
    - only executes every 15 minutes (per instance)

- Powerful tool to combine challenge-constraints

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Schedule

- 2019 November
  - Concluding app concept decisions
  - basic implementation of Context Layer
- 2019/11/08
  - First Seminar presentation
- 2019 December
  - First running prototype that
    - is context aware
    - can download via FTP
    - manages a download queue
- 2019/12/13
  - Presentation of Adaption Concepts
- 2020 January
  - Implement Conclusions from peer review
  - Squash bugs
- 2020/01/31 Final presentation

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Questions and Feedback are welcome

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