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Praktikum Mobile Productivity

Introduction – 10/17/2006





Outline:

- **Basic Information**
- **Organizational Stuff**
- **Technology**
 - SVN
 - Java ME
 - IDEs
- **Exercise 1**



Basic Conditions:

- Two phases: single and group work phase
- Software development in a team

Time plan

- **Phase 1 – Single Work:**
 - Exercise 1 – 4
 - Exercise 5 partially
- **Phase 2 – Project Work:**
 - Starting 11/21/2006 or 11/28/2006
 - Exercise 5 – 8
 - Project Implementation



- **4 SWS**
- **Weekly Meeting**
 - Tuesday 10:00 – 12:00
 - Room 107, Amalienstraße 17
- **Room for the practical parts:**
 - Medienlabor 103, Amalienstraße 17
 - Special accounts required
 - Open during normal working times (8:00 – 17:00)
 - 1 key for each group
- **Homepage:**
 - <http://www.medien.ifi.lmu.de/lehre/ws0607/pmp/>
- **SVN**
 - `svn://murx.medien.ifi.lmu.de/ws0607/pmp/team[number]`
(e.g. `svn://murx.medien.ifi.lmu.de/ws0607/pmp/team1`)



Team 1:

- Ragutt
- Möller
- Moog
- Reithmeier
- Kaczkowski

Team 2:

- Gassner
- Wiesner
- Berwein
- Dingler
- Jacobi
- Konda

Team 3:

- Pollner
- Sauerwein
- Weinand
- Kahl
- Rabinowitsch



Needed Accounts

- **SVN username**
- **Medienlabor-Kennung**
- **Belegungsplan Medienlabor**



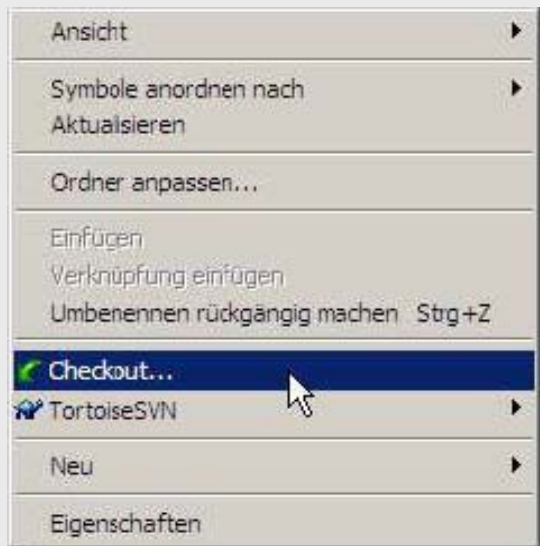
SVN - General

- Version control system
- Enables collective editing of shared source code
- Data stored in a „Repository“ which is accessed over the network
- Editing on local copies of the files
- Old version available on the server
- When possible, files will be merged automatically when edited by multiple users at the same time
- Similar to CVS



SVN – First Steps (using Tortoise SVN)

1. Download a SVN Client like Tortoise SVN for Windows
<http://tortoisesvn.net/>
2. Checkout your team repository (creates a local copy of the repository)
Create an empty folder, open it, right-click and choose „Checkout“.





SVN – First Steps (using Tortoise SVN)

3. Each time you start working perform the “Update” command.
4. Each time you’re done working perform a “Commit”. Both commands are located in the right-click menu.
5. Further functionalities are available in the right-click menu like “delete”, “rename” and more.

Attention: Do not use the OS-functionalities for this functions.

For further Information read the German SVN introduction by Richard Atterer, which can be found here:

http://www.medien.ifi.lmu.de/fileadmin/mimuc/mmp_ss04/Projektaufgabe/mmp-subversion.pdf

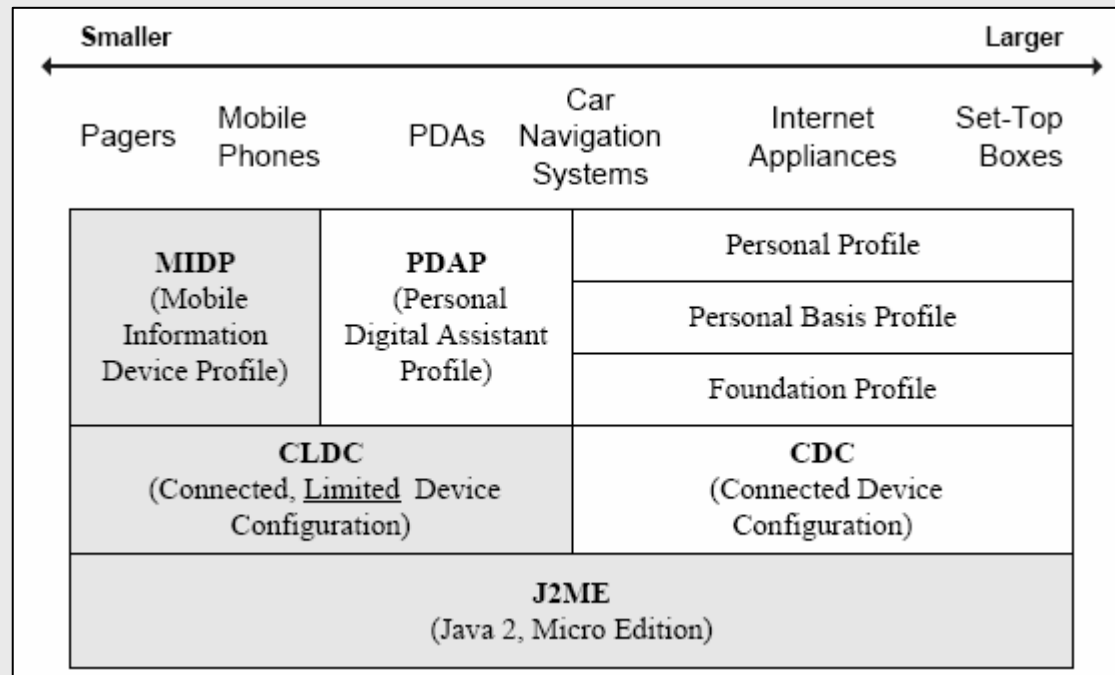


Java ME

- **slim Java for mobile devices**
- **Java ME stack**
 - configuration + profile + additional APIs
- **Configuration**
 - JVM + minimal amount of functionality
 - subset of Java SE
 - e.g. CLDC 1.1
- **Profiles**
 - enhance the configuration with functionality
 - APIs for user interface, persistent storage, etc.
 - e.g. MIDP 2.0
- **Additional APIs for Bluetooth connections, Multimedia and more**



The Java ME Universe



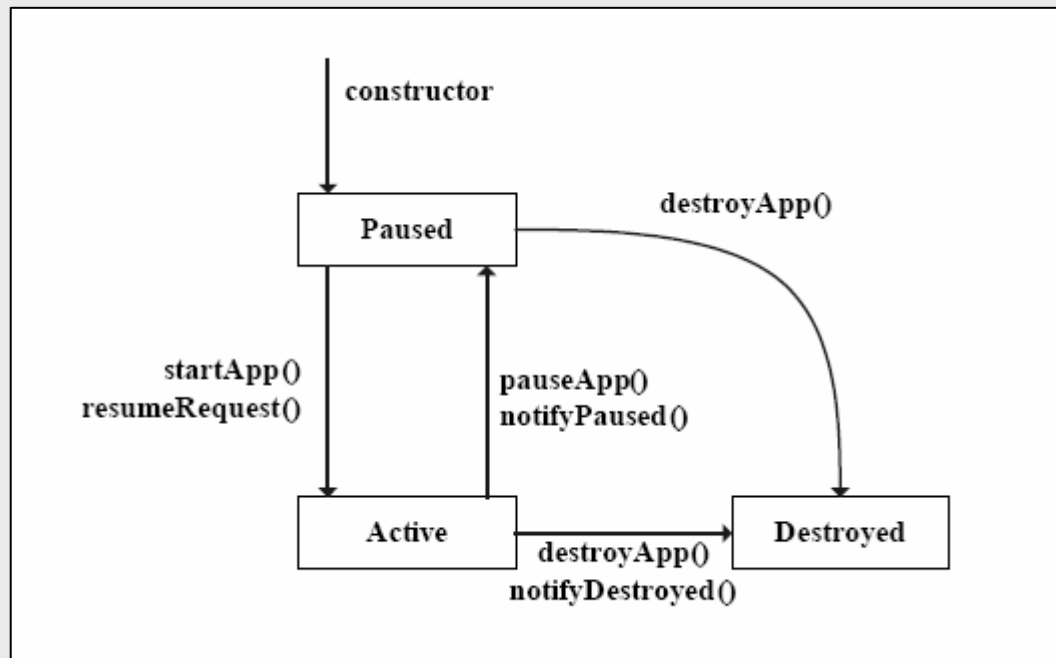


MIDlets

- **MIDP applications are called MIDlets**
- **Every MIDlet is an instance of `javax.microedition.midlet.MIDlet`**
 - Constructor
 - Implements lifecycle methods
- **Conceptually similar to Applets**
 - Can be downloaded
 - Executed in host environment



MIDlet Life Cycle 1/2





MIDlet Life Cycle 2/2

- **Application Manager controls the installation and execution of MIDlets**
- **Start of a MIDlet: constructor + startApp() are executed by the Application Manager**
- **MIDlet**
 - Place itself in paused state (notifyPaused())
 - Destroy itself (notifyDestroyed())
- **One method for every state transition**



MIDlet Build Cycle 1/2

1. Edit source code
2. Compile (like compiling normal java)
3. Preverify
 - Bytecode verification (makes sure it behaves well + won't do nasty things) is split into two steps
 - lightweight second verification on the mobile device (standard verification too memory intensive)
 - special class format (adds 5% to normal class file size)
 - Normally not visible for the programmer



MIDlet Build Cycle 2/2

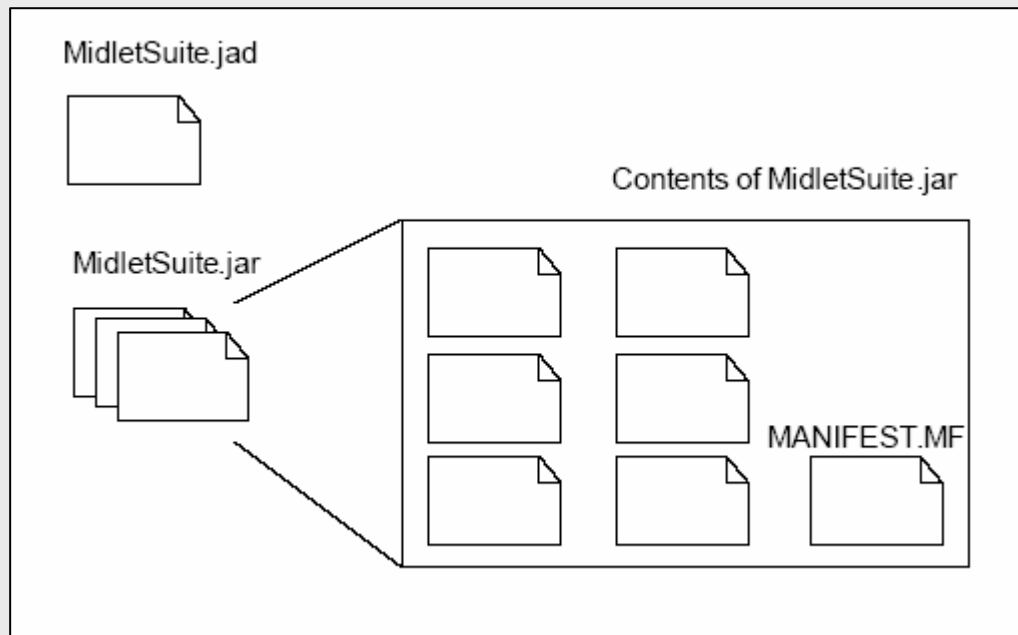
4. (Application) Package, MIDlet Suite

- MIDlets + Classes + Resources + Manifest Information => Java Archive (JAR)
- Manifest: describes content of archive (versions of CLDC and MIDP, name, version, vendor)
- Application Descriptor (*.jad)
 - Same information like manifest (+ MIDlet-Jar-Size, MIDlet-Jar-URL), but a external file
 - Normally used for installation

5. Test or Deploy



Anatomy of a MIDlet Suite





MIDP: User Interface

- **Goal: Write Once, Run Anywhere**
- **Anywhere?**
 - Different screen sizes
 - Resolution of screen
 - Color or grayscale screen
 - Different input capabilities (numeric keypad, alphabetical keyboards, soft keys, touch screens, etc.)



User Interface: Methodology

- **Abstraction (Preferred Method)**
 - specifying a user interface abstract terms
 - (Not:) “Display the word ‘Next’ on the screen above the soft button.”
 - Rather: “Give me a Next command somewhere in this interface”
- **Discovery (Games)**
 - Application learns about the device + tailors the user interface programmatically
 - Screen size => Scaling



MIDP: Persistent Storage

- **Goal: Write Once, Run Anywhere**
- **Anywhere?**
 - Device with Flash ROM
 - Battery-backed RAM
 - Small Hard Disk

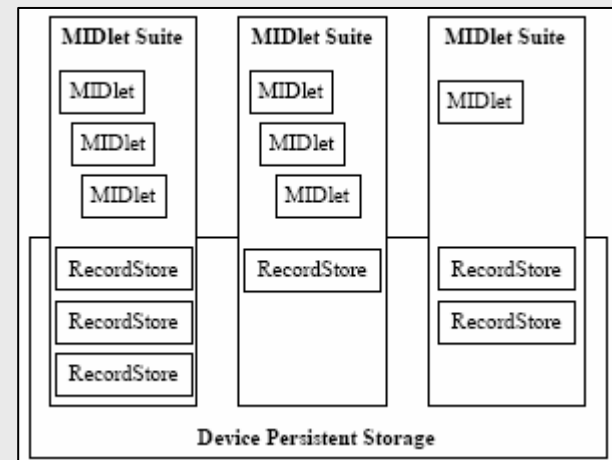
=> Abstraction is needed

- **Record stores (small databases)**
- **Min. 8KByte (Nokia 6600: 'the only limitation is the amount of free memory')**
- **New Mobile Phone contain the File API, which allows direct access to the file system**



Persistent Storage: Record Stores

- **Record store**
 - contains records (pieces of data)
 - instance of `javax.microedition.rms.RecordStore`
- **Every MIDlet in a MIDlet Suite can access every Record Store**
- **Since MIDP 2.0:**
 - Access across Suite borders possible !!!





Recommended IDEs

- **Netbeans** (<http://www.netbeans.org/products/ide/>) + **Mobility Pack** (<http://www.netbeans.org/products/mobility/>)
 - Much better Java ME support than EclipseME (e.g. graphical interface editor)
- **Eclipse** (<http://www.eclipse.org/>) + **EclipseME** (<http://eclipseme.org/docs/index.html>)
 - May be better for developers experienced in using eclipse



Exercise 1

- Basics of Java ME
- Exercise:
http://www.medien.ifi.lmu.de/lehre/ws0607/pmp/ex/pmp_exercise1.pdf
- Material:
<http://www.medien.ifi.lmu.de/lehre/ws0607/pmp/ex/exercise1.zip>
- Deadline October 23rd, 12 p.m.
- Check your solution to your personal SVN folder inside your team's SVN repository



Have fun!