



Distributed Systems – Exercises

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VS Exercises

- Programming exercises
 - Three assignments
 - One open project
 - Can be carried forward from last year

- Theoretical exercises
 - Exam preparation for Part 1 (Mattern)
 - Assignments for Part 2 (Wattenhofer)



Grading System with «Save-Points»

- Exam at the end of the semester up to 180 points
- Improvement through the exercises
 - Programming exercises up to 45 points
 - Theoretical exercises in Part 2 up to 20 points
 - Participation required for «Save-point»
- Total for grading up to 245 points

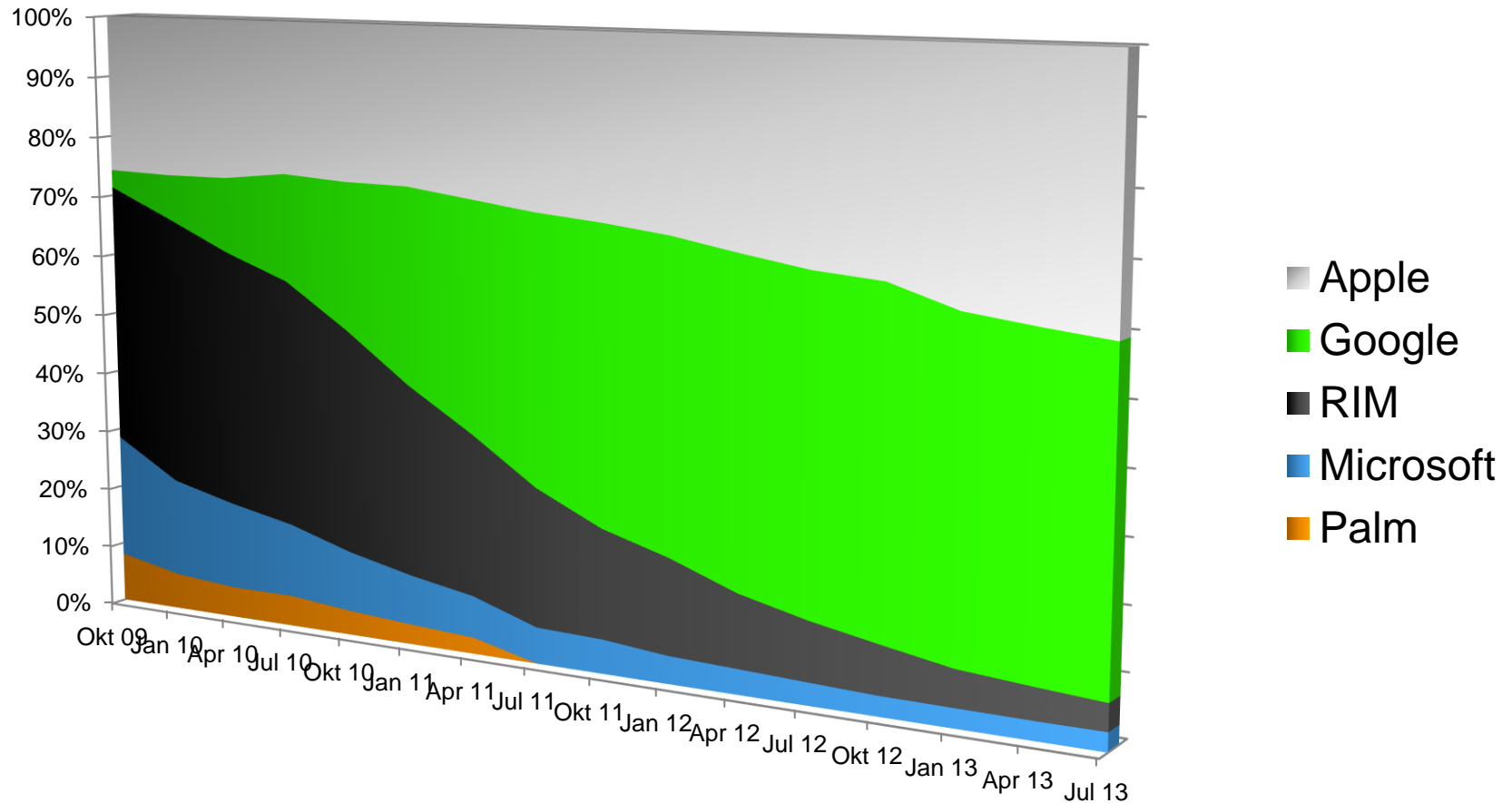
- We take your best result when all save-points are reached
 - Out of 245 points total or out of 180 points exam only
 - Last year 96% improved their grade through the exercises



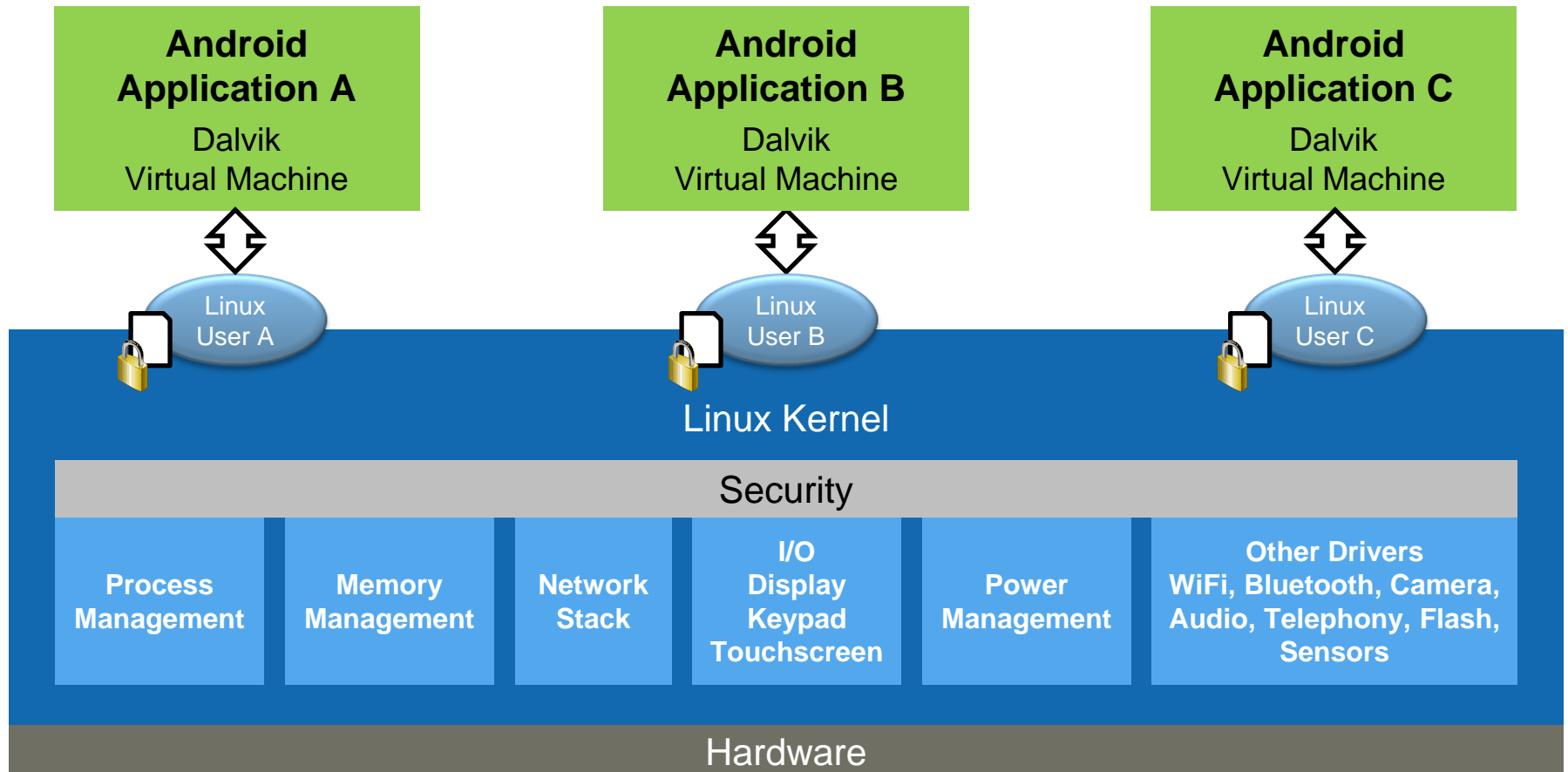
ANDROID

Mobile Platform for Distributed Systems

Android Smartphone Market Share (U.S. 13+)



Platform Internals



Android Key Terms

- «Activity»
 - Logical unit of a user activity (like window in a computer program)
 - Usually full-screen (cf. Fragments)
- «View»
 - Hierarchical UI element
 - Combined in layouts and extended to Widgets with more functionality
- «Service»
 - Background activity without UI, e.g., music player or FTP server



Android Key Terms

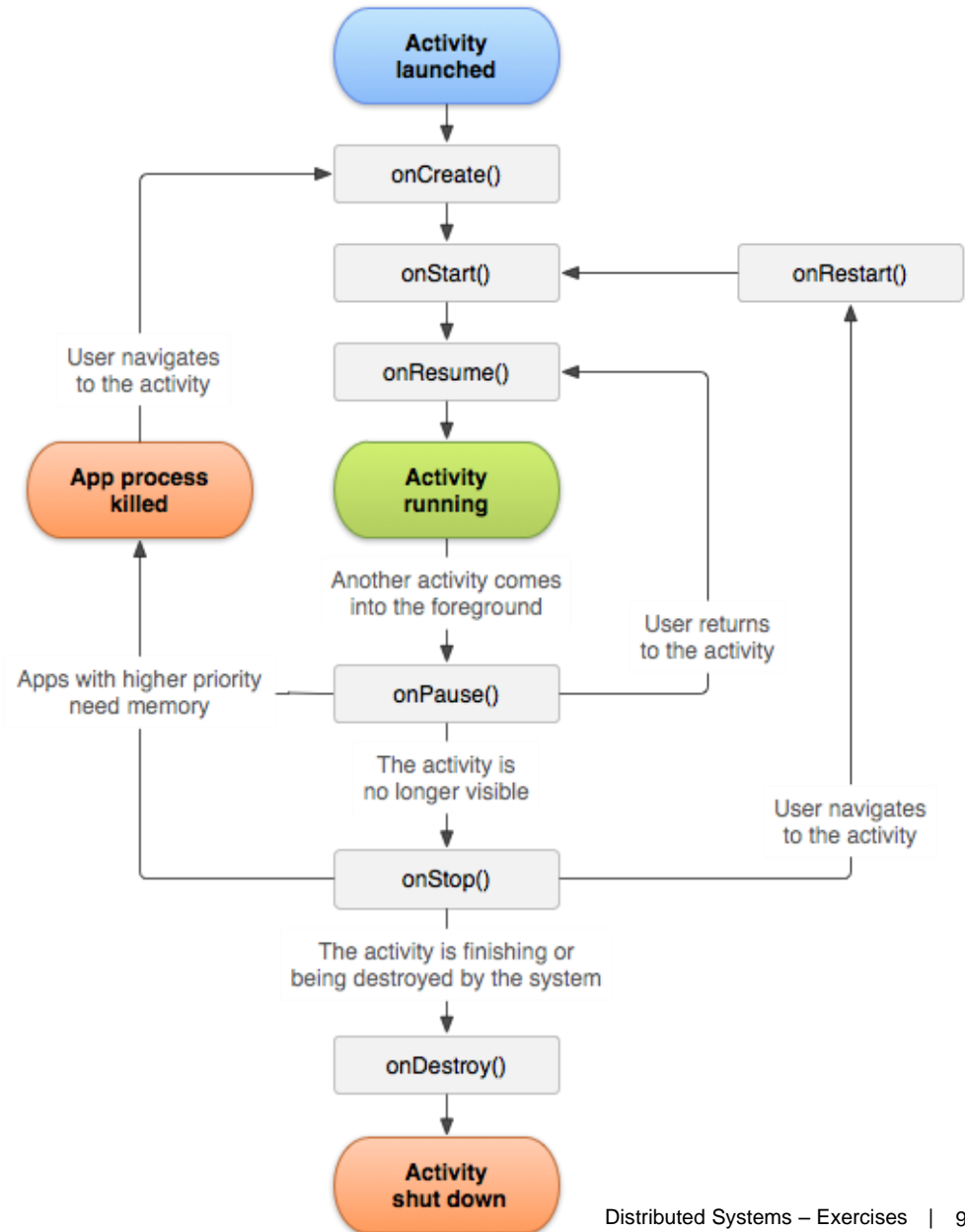
- «Intent»
 - Starts or switches between «Activities»
 - Passive data structure
 - Describes the action
 - An explicit class to activate
 - Or Implicit components that match an «Intent filter»
- «BroadcastReceiver»
 - Listens for global events (Intents)
e.g., «headphones were plugged» sent by system
 - Can delegate to preferred Activity
 - Can inform the user



Activity Lifecycle

- Multi-Tasking
 - OS keeps apps alive as long as possible
 - On memory shortage, processes are killed according to their priority

- States of an Activity
 - Running (Resumed)
 - Paused
 - Stopped
 - Finished/killed





Programming Exercises

Team



Matthias Kovatsch



Marian George



Leyna Sadamori



Hông-Ân Cao

Organization

- Teams of two (sometimes three)
 - Develop with the emulator
 - Test on the actual phone
 - Document your work in a report
- Smart phones
 - Use your own Android – no rooting required
 - HTC Desires with Android 4.2.2 available by us
- Grading
 - Per group
 - Can be carried forward from/to last year



Schedule



- **A1: GUI and hardware**
 - 30 Sep 2013 – 14 Oct 2013 (2 weeks)
- **A2: Client/server, Web services, and the Cloud**
 - 14 Oct 2013 – 28 Oct 2013 (2 weeks)
- **A3: Group communication and logical time**
 - 28 Oct 2013 – 11 Nov 2013 (2 weeks)
- **A4: Open project (with presentation)**
 - 11 Nov 2013 – 20 Dec 2013 (5.5 weeks)



ANDROID DEVELOPER TOOLS

Homework

Create Groups

- Log in to submission system
 - <https://www.vs.inf.ethz.ch/edu/vs/submissions/>
 - Will open soon
- Leader starts a group
- Add partner(s)
- Specify which phone you will be using
 - Own device
 - One of our HTC Desires



Get a Phone if Necessary

- Some HTC Desires available
 - Updated to CyanogenMod 10.1 (Android 4.2.2)
 - When: Wednesday 12pm – 1pm
 - Where: CNB H 108
- Familiarize yourself with the device
- Activate debugging when using your own
 - «Settings > About phone > Build number» – Tab several times
 - «Settings > Developer options > Android debugging»



Install the Toolchain

- Java SE JDK
 - <http://www.oracle.com/technetwork/java/javase/downloads/index.html>
- Android SDK: ADT Bundle including Eclipse
 - <http://developer.android.com/sdk/index.html>
- Use Android SDK Manger to get
 - Android 4.2.2 or the version of your phone
 - Google USB Driver (Windows only)
- Device driver
 - Android Composite ADB Interface
 - Google for your OS / device combination

Test Your Toolchain

- Create an AVD in the «Android Virtual Device Manager»
 - Device: Nexus One (similar to HTC Desire)
 - Target: Android 4.2.2 - API Level 17
 - Back Camera: Emulated
 - Emulator Options: Snapshot
- Create an «Android Sample Project» in Eclipse
 - New > Other > Android
 - Sample: ApiDemos
- Run the project as Android application
 - On the AVD
 - On your phone

Android Tutorial

- Friday, 27 September 2013
 - Introduction to Android programming
 - «Live-Hacking» together with you
→ Be prepared!
- Monday, 30 September 2013
 - First Assignment

