Summer class

Do-It-Yourself Networking

September 2016

DIYnet class in a nutshell

• 1 – 30 September 2016

• Focus: ideas, design, and implementation

• Lectures to introduce the background, concepts, tools, …

• Hands-on exercises for warm-up

• Coding and experimental validation

• 10 ECTS

• Working in groups of two

• Grading based upon documentation, running code, contributions
Rough schedule

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Tools & prerequisites

- Raspberri Pis
- Android phones
- WLAN access points
- Optionally some sensors

- Expectations
  - Linux
  - System-level programming knowledge
  - Java
  - Scripting (e.g., PHP, python, perl, shell, … -- whatever you’ll need)
  - Web technologies: HTML 5, Javascript
  - Android native development (optional)
Next steps

- Moodle course details to come shortly
- Still some inconsistencies in the online system
- We’ll start on 1 September @ 10ct

The Internet is convenient…

- Connects everybody, (almost) anywhere
- Cloud-based services relieve us of many hassles
  - Mobility between places and devices
  - Storage and content management
  - Wealth of services easy to try and use and to mash up
- Opens up unprecedented opportunities
  - Richness of content
  - Sharing, talking, networking
  - In unexpected ways
BUT...

Many things aren’t efficient

The net makes us dependent

Services become vulnerable

Example: Facebook

- Data centers in different parts of the world
- A network spanning continents with many peering points

Inefficient: data travel long distances even if people are close by

Dependent: Access, ISPs, cloud services need to function

Vulnerable: to random acts of ISPs, Facebook (& its users), governments, …
Too easy…

• Keeping content that matters where it matters
• Limiting third party dependencies
• An intuitive understanding of the sharing context:
  “What happens in Vegas stays in Vegas!”

Neighborhood Networking:
Localizing Content Sharing

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Do-It-Yourself…

Do-It-Yourself…
Liberouter

- Basic features
  - WLAN access point
  - Captive portal
  - SCAMPI router
  - Storage node
  - Can mesh with other liberouters
  - Servers as a local app store

- Applications
  - Android liberouter distribution
  - Native SCAMPI (Java) applications
  - HTML5 applications (SCAMPI-enabled)

SCAMPI Networking Platform

Message-based interactions
- Self-contained ADUs (arbitrary size)
- Metadata
- Lifetime

Unicast / multicast / broadcast
- Messaging + real-time streams

Publish / subscribe

Search using metadata

Geo-based content sharing
(Floating Content)
SCAMPI Platform and Apps

Sample Applications
Some Apps

GuerrillaTags

GuerrillaPics

Instant Social Networking

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PeopleFinder

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More complex WiP: Here & Now

Weird apps: messages in bottles