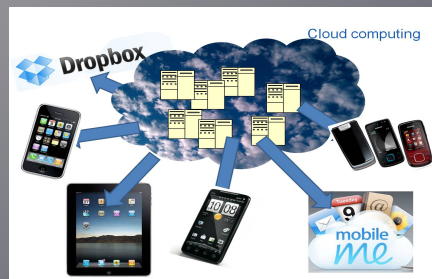# Mobile Cloud Computing

Outline

- Understanding Mobile Cloud computing
- Mobile Cloud Infrastructure
- Trends, businesses, contexts of Cloud-based mobile
- Mobile development

Evolution of Mobile Computing

- Biggest impact on society
- From heavy cumbersome device to smartphones
- Smartphones
  - Browse websites
  - Video calls to phones and computers
  - GPS-navigational operations
  - Exchange text messages
  - E-commerce
  - Run apps
- 3G vs. 4G

What is Mobile Cloud?

Mobile Devices & Mobile Cloud

500 million apps downloaded.
And counting.

- One of the hottest trends in cloud computing -> The convergence of cloud computing and mobile apps

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Mobile Cloud

- Definition
  - An instance of technology using cloud computing in mobile environment
    (Liu QingFeng)
- Collection of concepts
  - SOA (Service-Oriented Architecture)
  - Distributed and grid computing
  - Virtualisation
  - Other services from cloud providers
- Why cloud computing is suitable for the mobile environment?

The cloud provides advance Mobile contexts

- Photo / Audio context
    - Image processing / Voice to text
    - Scientific use
- Social context
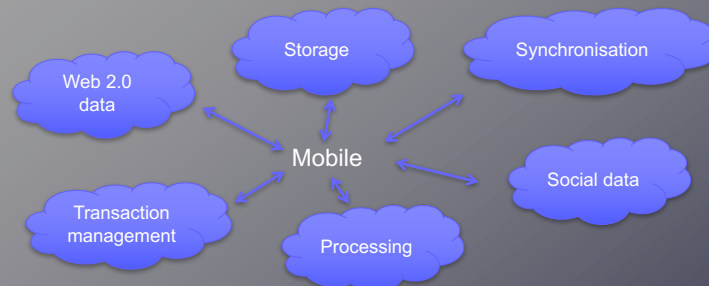   - Twitter relationship for instance / Influence, info flow, SN analysis
- Group context
    - Similar Web 2.0 rankings (Yelp..)

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Cloud services and mobile device limitations

- Minimal storage
- Highly constrained processing environments
- Multitasking / concurrency support

Storage

Synchronisation

Web 2.0 data

Mobile

Social data

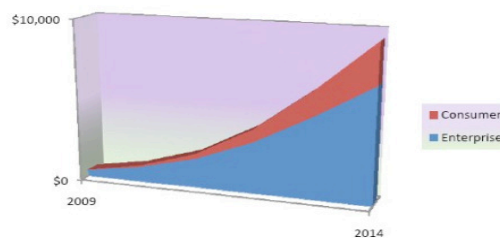Transaction management

Processing

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Mobile cloud

- Estimated to grow from €350 million in 2009 to €9 billion in 2014 (and nearly €38 billion by 2016!*)

Figure 1: Total Market for Cloud-Based Applications. Consumer & Enterprise Applications, 2009-2014
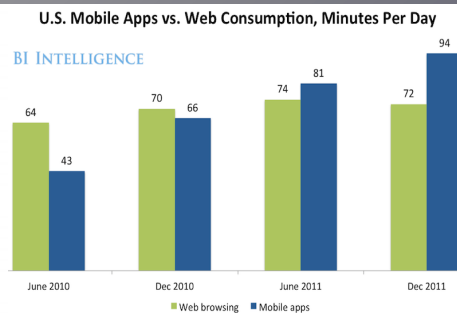
Source: Juniper Research

* Juniper research

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Mobile cloud: indicators

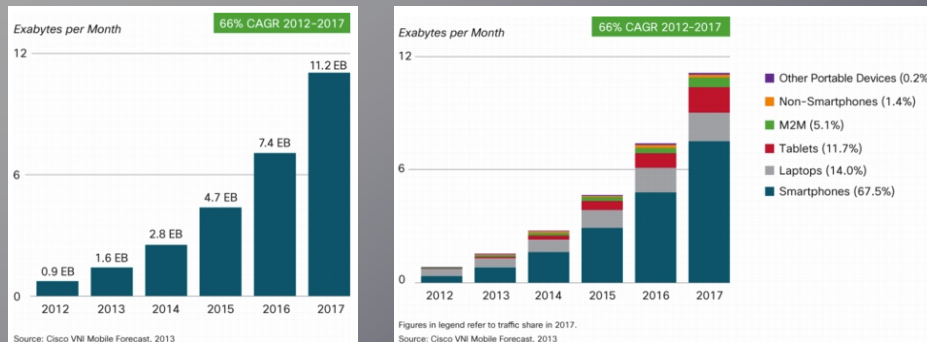Projected Endpoint Population: Mobile Devices vs. PCs
Source: Trend Micro

U.S. Mobile Apps vs. Web Consumption, Minutes Per Day

BI INTELLIGENCE

Source: Flurry Analytics, Alexa, comScore

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Mobile cloud: indicators
Global mobile data traffic

CAGR: Compound Annual Growth Rate

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Mobile Cloud Ecosystem

- Ecosystem
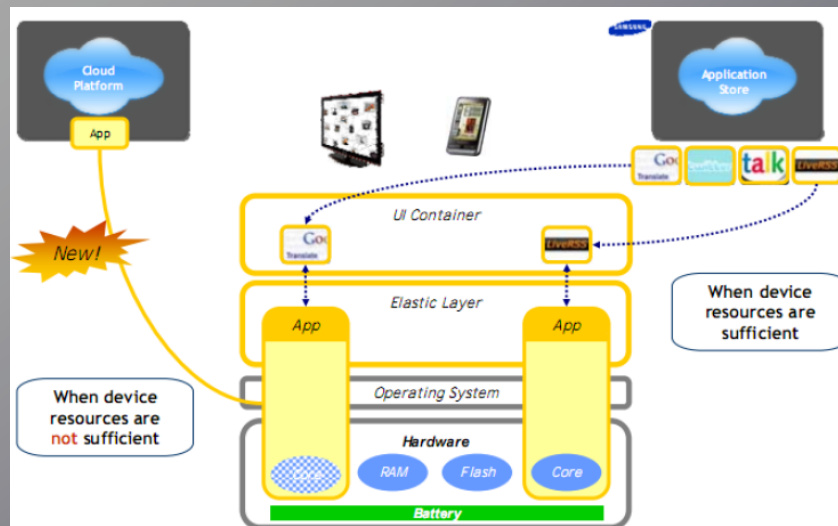 - Environment that consists of living and non-living things with which one can interact
- Mobile cloud Ecosystem
  - Web browsing
  - Apps and widgets
  - Voice commands and voice recognition
  - Display screens
  - Keyboard interface
  - Touchscreens
  - …

Pages, Apps and Widgets

- Web pages
  - Targeted for a mobile display: mobile browsers
- Apps
  - Device-specific program
  - App stores
- Widgets
  - Like App
  - Always active
  - Always running and communicating
  - …

Mobile Cloud Infrastructure

(Meng Zhu)

Mobile Development

- Mobile web is not the traditional web
- Fast is good
- Goals and requirements
- Cannot support everything
- Handle different display sizes