Topic 12: Google Applications

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CS 6
5/4/2016
Outline

• Data Storage
• Calendar
• Google Maps
• Google Earth
Data Storage

- Data stored on workhorse computers
  - *Cheap and scalable*
- Separate servers for control, the application, and the data
  - *Redundancy (safety measure)*
- Highly secure, even few Google employees have access
  - *Underfloor intrusion detection! (Laser beams)*
Data Storage

- Nobody really knows how many servers
  - *Those who do aren’t talking*
- One row might have thousands
- *Energy usage estimations: ~1 million servers*
Data Storage

Americas
Berkeley County, South Carolina
Council Bluffs, Iowa
Douglas County, Georgia
Jackson County, Alabama
Lenoir, North Carolina
Mayes County, Oklahoma
Montgomery County, Tennessee
Quilicura, Chile
The Dalles, Oregon

Asia
Changhua County, Taiwan
Singapore

Europe
Dublin, Ireland
Eemshaven, Netherlands
Hamina, Finland
St Ghislain, Belgium
Google Calendar

- Web-based event management tool
  - Accessible from any web device
- Sync with other calendar tools
  - Outlook, Blackberry, Apple iCal, Mozilla Sunbird
- Event invitations, reminders
  - Email a reminder
  - Popup window (from gmail)
Google Calendar

• Shareable
• Searchable
• Integrated
• *Can sync directly from emails (via keywords)*
• *Sync to your phone*
• Same as Apple’s iCloud
• *Sync with maps (directions, etc.)*
Mapping Tools

• Mapping
• Driving directions
• Street view
• “My maps”
• Recently: download offline map
Mapping Apps

- Google Maps
- Apple Maps
- AutoNavi
- Nokia HERE
- NavInfo
- Baidu

Scene in 2011...
Mapping Apps

• Google Maps
• Apple Maps
• AutoNavi (China)
• Google & Apple
• Nokia HERE Maps
• China: NavInfo / Baidu
Battleground: China

- *Apple Maps now too* (2012)
- Win for AutoNavi
- Blow for Nokia
- *Baidu / NavInfo*
Battleground: China

Source: Enfodesk, Terracotta
Google vs. Apple

• Apple (2015): 3.5:1 ratio of Apple maps to “second leading app” – on iOS!

• Default map app, result of “laziness”

• Based on fuzzy math, Google Maps projected to have 1 billion+ users

• Apple about 400 million total

• Puts Apple Maps at 25%, Google at ~70%

• Google and Nokia do not release usage #s
Google Earth

• Satellite image viewer
  • *Allows annotations on many layers*
• Client runs on your local computer
  • *Connects to server to get image data*
• Pro version now free!
Features

• View Earth (land, sea, sky), Moon, Mars
• Touring: can record tours, play them back
  • *Add photos and link locations together*
• 3D terrain
• View historical images
  • *Features can be added by anyone*
• Includes 3D flight simulator