

# The Online Advertising Zoo

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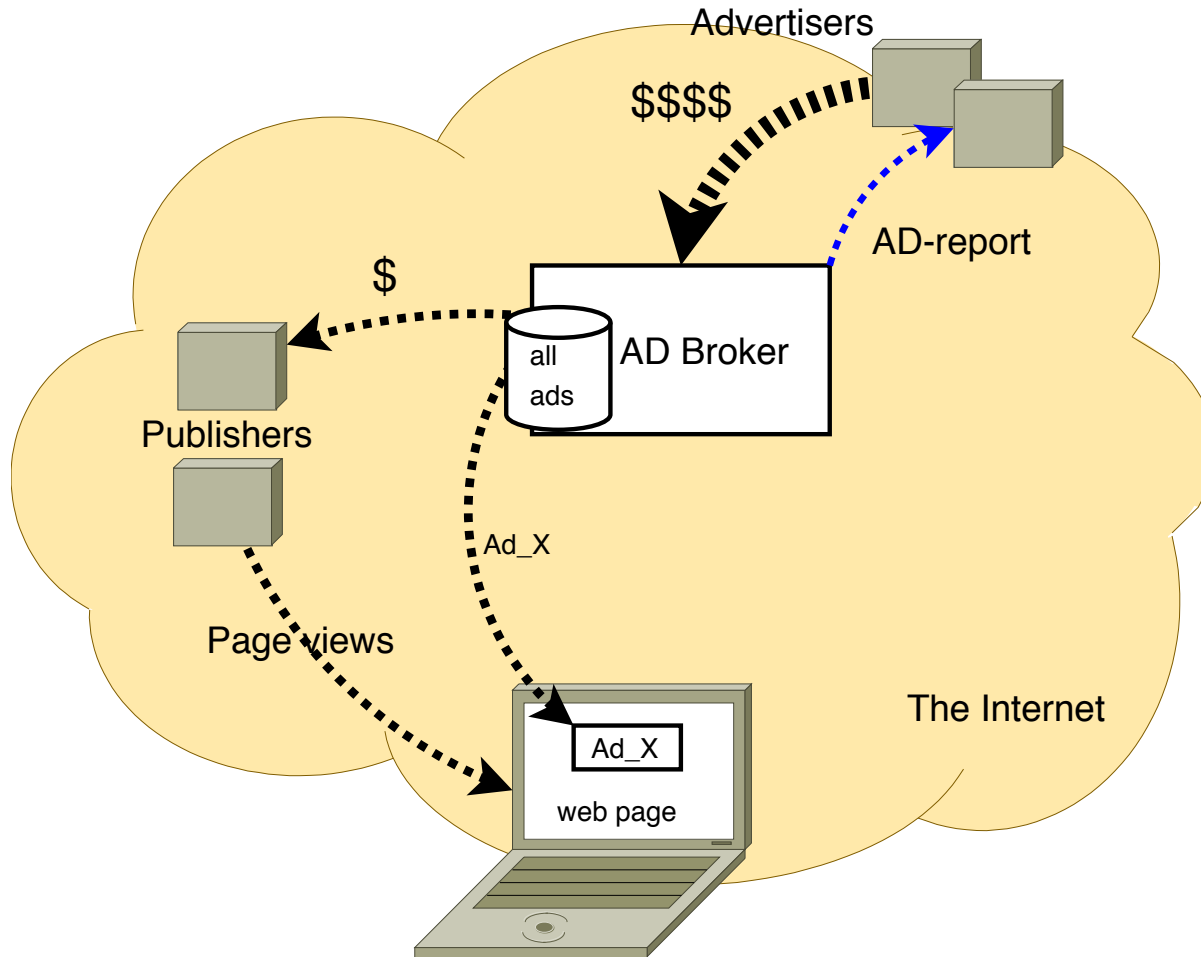
# Online advertising industry

- Online advertising accounts for almost 9 percent of all advertising in the United States
- \$23.4 billion in 2008, with last year clocking in at \$31.7 billion
- Source:  
[http://www.iab.net/insights\\_research/  
industry\\_data\\_and\\_landscape/adrevenuereport](http://www.iab.net/insights_research/industry_data_and_landscape/adrevenuereport)

# Key players

- ★ **Advertiser:** has a service/item to provide (Bar, food,..)
- ★ **Ad Provider:** Provides the ad to be displayed on the customer's device & pays the content provider and telco and charges the advertiser (Google)
- ★ **Content Provider:** Provides the content & incentive for the user to view the ads (games/interesting phone app)
- ★ **Telco:** Provides the infrastructure for ad delivery and report collection (DT)

# Players in the Ecosystem



Today's broker-centric advertisement method

# Today's business model

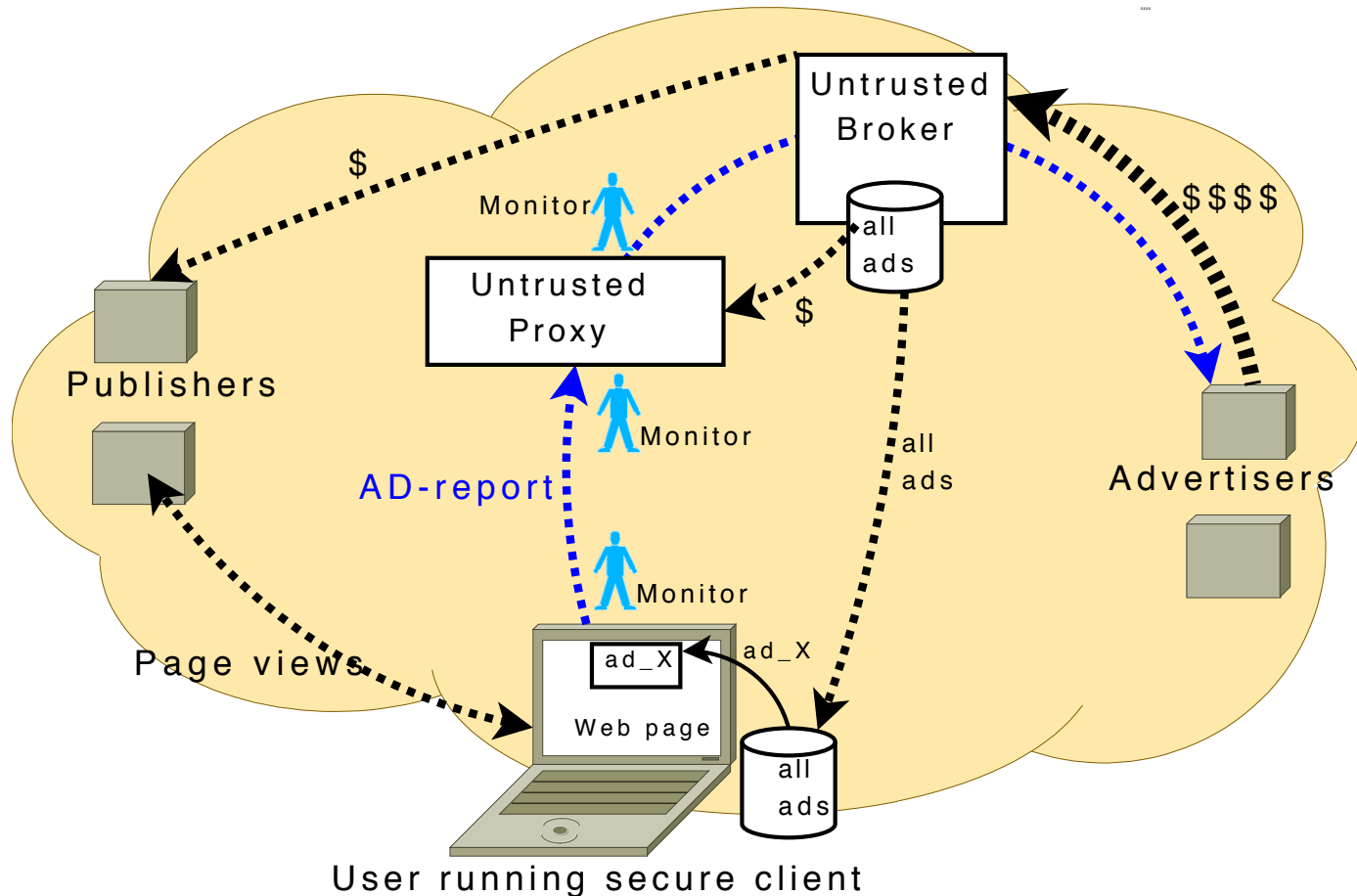
- Advertisers bid for ad space,
  - pay for clicks
- Publishers provide ad space,
  - get paid for clicks
- Deal with click fraud
- Collect information (clicks, profile, views,..)

Sources:

Hamed Haddadi, "Battling Online Click-Fraud Using Bluff Ads", ACM SIGCOMM Computer Communication Review (CCR) , Vol. 40, No. 2, April 2010

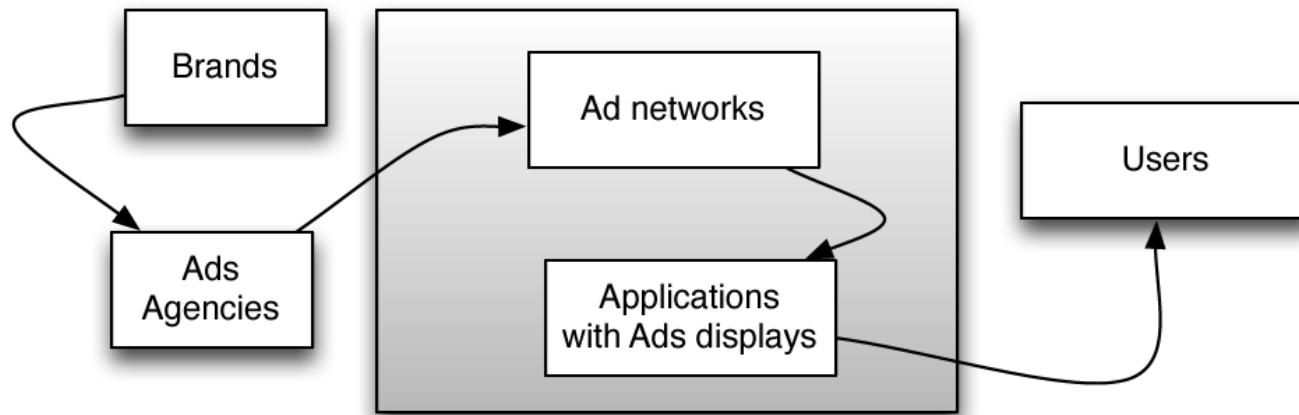
Hamed Haddadi, Saikat Guha, Paul Francis, "Not All Adware is Badware: Towards Privacy-Aware Advertising", 9th IFIP Conference on e-Business, e-Services, and e-Society (I3E 2009), September 2009

# Privacy-Preserving Advertising (PrivAd) Framework



# Mobile Advertising

- 73% of the apps in Google Play are free
- Mobile ad traffic is the only type of network activity for some apps.



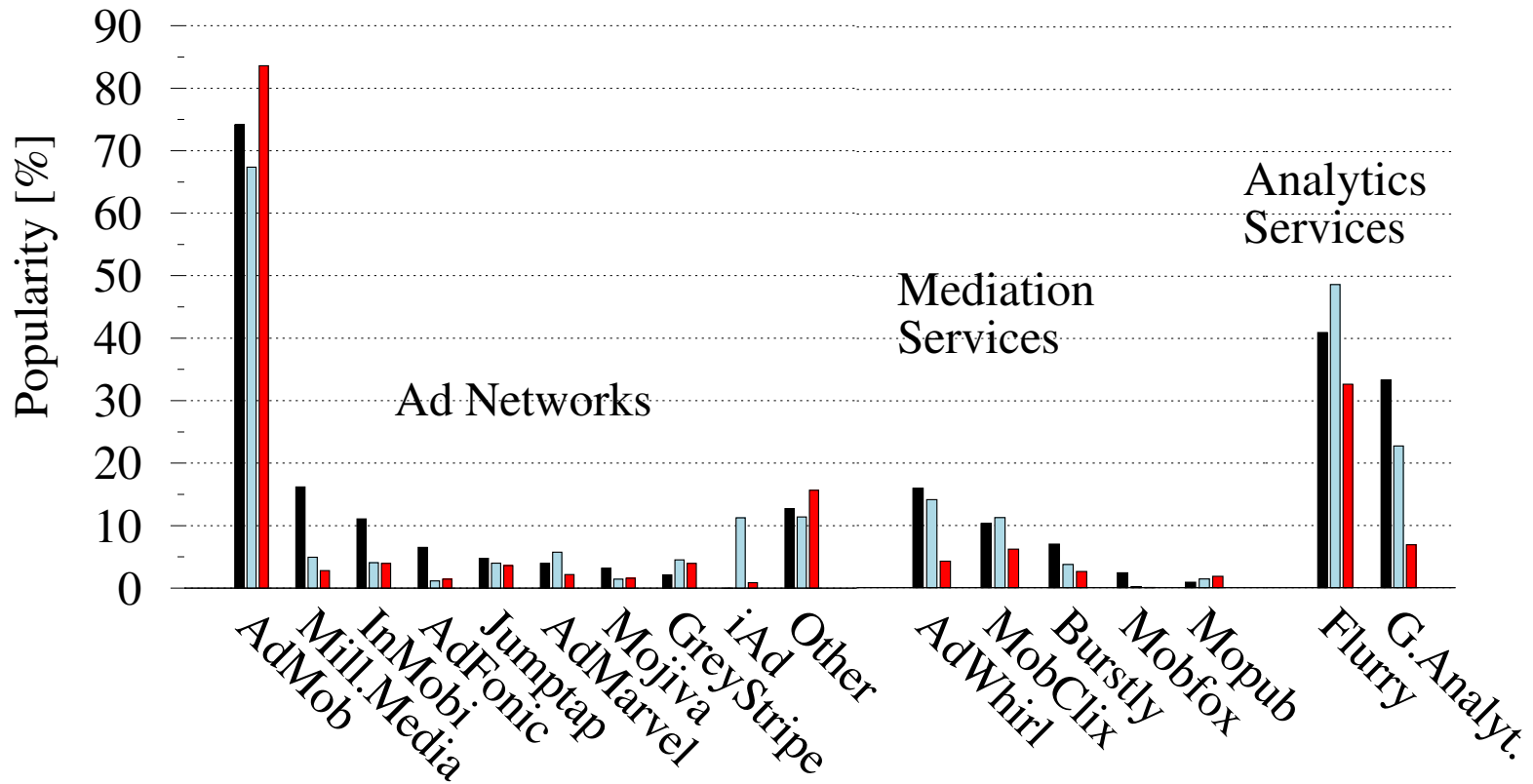


# App usage and ad modules

| Rank | Application Name  | Category       | Ad Provider      |
|------|-------------------|----------------|------------------|
| 1    | Facebook          | Social Network | N/A              |
| 2    | Talking Pierre    | Entertainment  | MobClix          |
| 3    | Ceramic Destroyer | Arcade         | AdMob            |
| 4    | WhatsApp          | Communication  | N/A              |
| 5    | Cartoon Camera    | Photo          | MobFox, MadVerti |
| 6    | Skype             | Communication  | N/A              |
| 7    | Angry Birds       | Arcade         | Burstly          |
| 8    | Onavo             | Tools          | N/A              |
| 9    | Talking Tom Cat 2 | Entertainment  | MobClix          |
| 10   | Viber             | Communication  | N/A              |

- Data set containing 1.7 billion traffic connections, which corresponds to 22TB of volume downloaded on 13th Aug. 2011 by more than 3 million subscribers of a major European mobile network
- Narseo Vallina-Rodriguez, Jay Shah, Alessandro Finamore, Yan Grunenberger, Konstantina Papagiannaki, Hamed Haddadi, Jon Crowcroft, “Breaking for Commercials: Characterizing Mobile Advertising”, in [ACM SIGCOMM Internet Measurement Conference, November 2012](#)

# Ad and analytics services



# Google everywhere!

- Google services on Android devices account for 73% and 80% of ad flows and bytes
- For iPhone devices the fraction of volume is lower due to the presence of iAd which accounts for 8% of the total bytes.
- AdMob's presence is even stronger on the iPad as it accounts for almost 90% of the total ad traffic on the platform.



Why not use the smartphones?

- *Always “connected”*
- *Location-aware*
- *Generous storage and CPU*

amazon.com Google

facebook

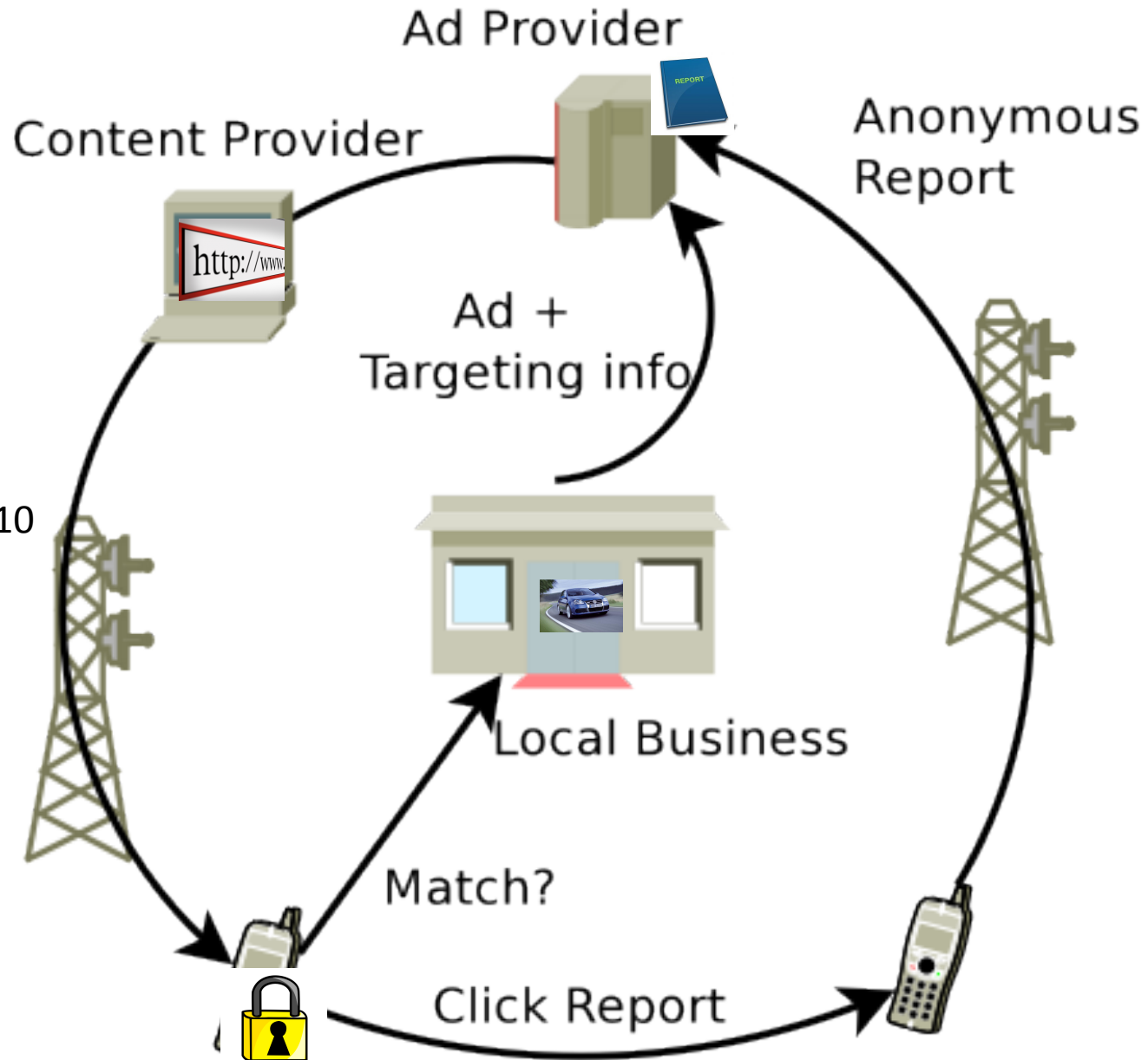
User Profile

CNN

BBC eBay

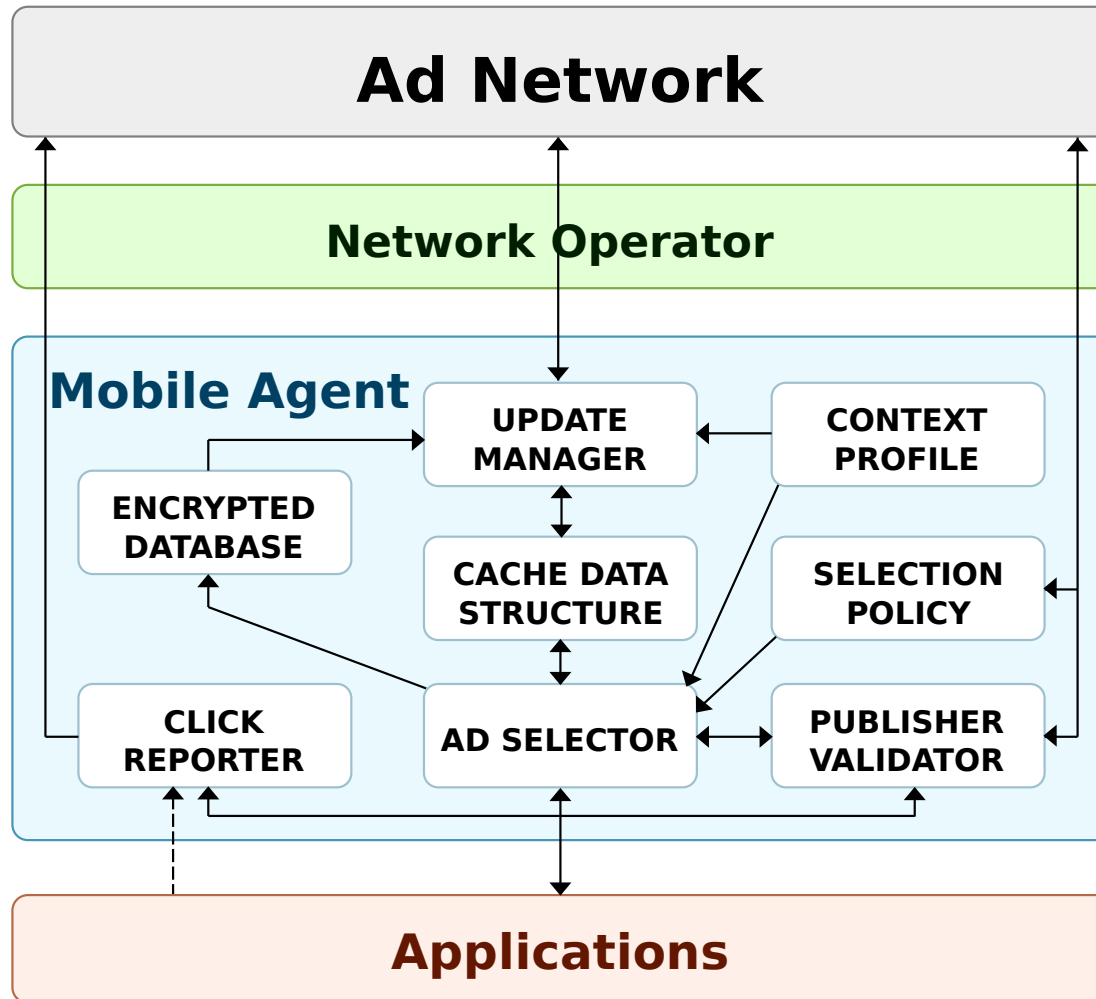
HotNets'09 & I3E'09

# MobiAd System Architecture



ACM MobiArch'10

# Client-based ad Architecture



# Auctions

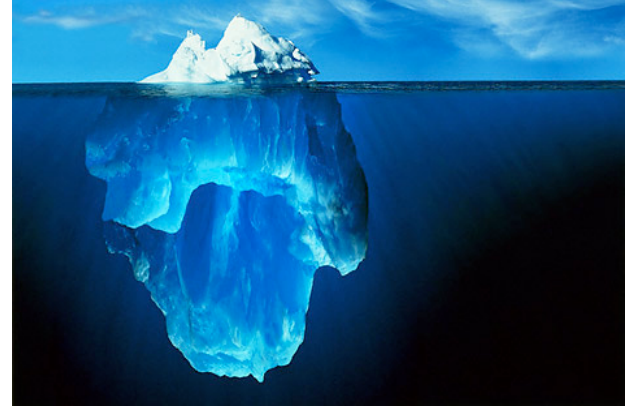
- Unlike conventional browsers, phone display area is limited
- Small number of ads can be displayed
- Click-through ratio and maximum bid should both be factored in choosing the ads on top
- Difficult to optimise since the number of ads shown will be low

# Highlights

- Adverts cost a lot of battery power and network bandwidth
- Privacy is a big issue, control over personal information is extremely difficult
- <http://www.eecs.qmul.ac.uk/~hamed/>
- The Online Advertising Industry: Economics, Evolution, and Privacy:
  - <http://www.intertic.org/Policy%20Papers/EvansEOAI.pdf>



# What Next...



- Semantics & NLP
- Data mining on smart phones and advertising
- Privacy vs. monetization of information (Privacy Analytics)

