Fraudulent Activity in Online Advertising

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THE UNIVERSITY of WISCONSIN MADISON

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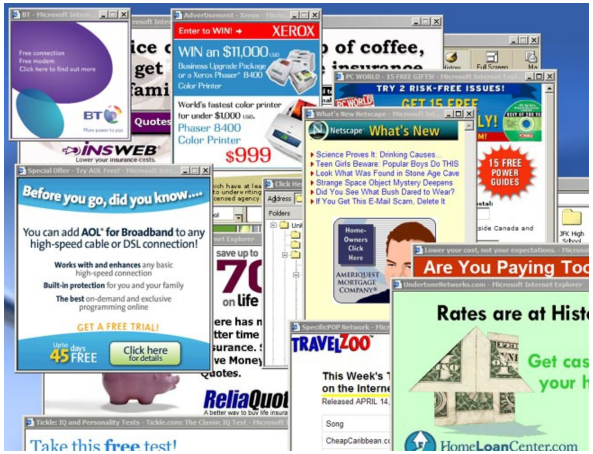
THE ADVANCED COMPUTING SYSTEMS ASSOCIATION

Motivation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World's fastest color printer for under $1,000 USD. Phaser 8400 Color Printer $999
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Built-in protection for you and your family
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Rates are at Hist
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TRAVELZOO
This Week's Top on the Internet
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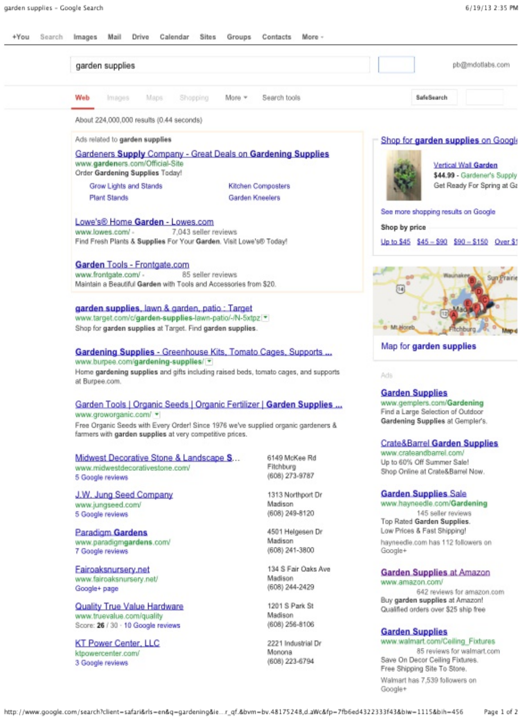
HomeLoanCenter.com
Take this free test!

1990’s – flat fee popups



garden supplies - Google Search 6/19/13 2:35 PM

+You Search Images Mail Drive Calendar Sites Groups Contacts More
garden supplies
pb@mdotlabs.com
Web Images Maps Shopping More Search tools SafeSearch

About 224,000,000 results (0.44 seconds)

Ads related to **garden supplies**

Gardeners **Supply** Company - Great Deals on **Gardening Supplies**
www.gardeners.com/Official-Site
Order **Gardening Supplies** Today!
Grow Lights and Stands — Kitchen Composters
Plant Stands — Garden Kneelers

Lowe's® Home **Garden** - Lowes.com
www.lowes.com/ - 7,043 seller reviews
Find Fresh Plants & **Supplies** For Your **Garden**. Visit Lowe's® Today!

Garden Tools - Frontgate.com
www.frontgate.com/ - 85 seller reviews
Maintain a Beautiful **Garden** with Tools and Accessories from $20.

garden supplies, lawn & garden, patio : Target
www.target.com/c/garden-supplies-lawn-patio/-/N-5xtpz
Shop for **garden supplies** at Target. Find **garden supplies**.

Gardening Supplies - Greenhouse Kits, Tomato Cages, Supports ...
www.burpee.com/gardening-supplies/
Home **gardening supplies** and gifts including raised beds, tomato cages, and supports at Burpee.com.

Garden Tools | Organic Seeds | Organic Fertilizer | **Garden Supplies** ...
www.groworganic.com/
Free Organic Seeds with Every Order! Since 1976 we've supplied organic gardeners & farmers with **garden supplies** at very competitive prices.

Midwest Decorative Stone & Landscape S... www.midwestdecorativestone.com/ 5 Google reviews	6149 McKee Rd Fitchburg (608) 273-9787
J.W. Jung Seed Company www.jungseed.com/ 5 Google reviews	1313 Northport Dr Madison (608) 249-8120
Paradigm **Gardens** www.paradigmgardens.com/ 7 Google reviews	4501 Helgesen Dr Madison (608) 241-3800
Fairoaksnursery.net www.fairoaksnursery.net/ Google+ page	134 S Fair Oaks Ave Madison (608) 244-2429
Quality True Value Hardware www.truevalue.com/quality Score: **26** / 30 · 10 Google reviews	1201 S Park St Madison (608) 256-8106
KT Power Center, LLC ktpowercenter.com/ 3 Google reviews	2221 Industrial Dr Monona (608) 223-6794

Shop for **garden supplies** on Googl
Vertical Wall **Garden**
$44.99 - Gardener's Supply
Get Ready For Spring at Ga
See more shopping results on Google
Shop by price
Up to $45 — $45 – $90 — $90 – $150 — Over $1

Map for **garden supplies**

Ads

Garden Supplies
www.gemplers.com/Gardening
Find a Large Selection of Outdoor **Gardening Supplies** at Gempler's.

Crate&Barrel **Garden Supplies**
www.crateandbarrel.com/
Up to 60% Off Summer Sale!
Shop Online at Crate&Barrel Now.

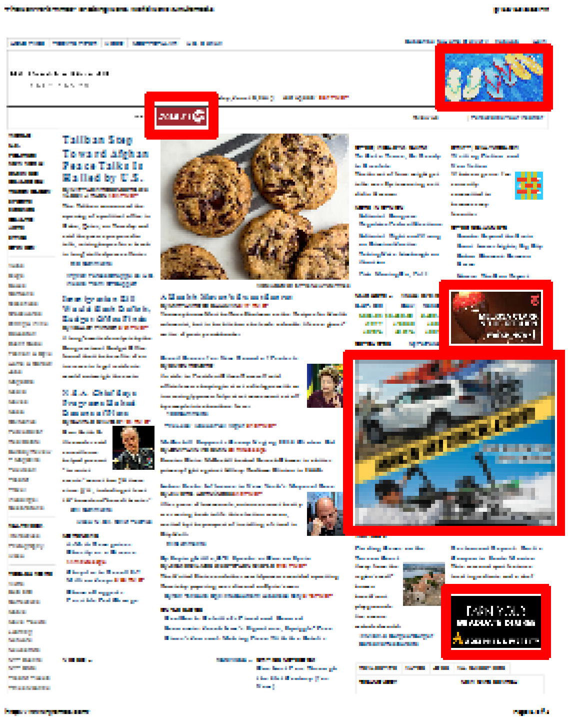
Garden Supplies Sale
www.hayneedle.com/Gardening
145 seller reviews
Top Rated **Garden Supplies**.
Low Prices & Fast Shipping!
hayneedle.com has 112 followers on Google+

Garden Supplies at Amazon
www.amazon.com/
642 reviews for amazon.com
Buy **garden supplies** at Amazon!
Qualified orders over $25 ship free

Garden Supplies
www.walmart.com/Ceiling_Fixtures
85 reviews for walmart.com
Save On Decor Ceiling Fixtures.
Free Shipping Site To Store.
Walmart has 7,539 followers on Google+

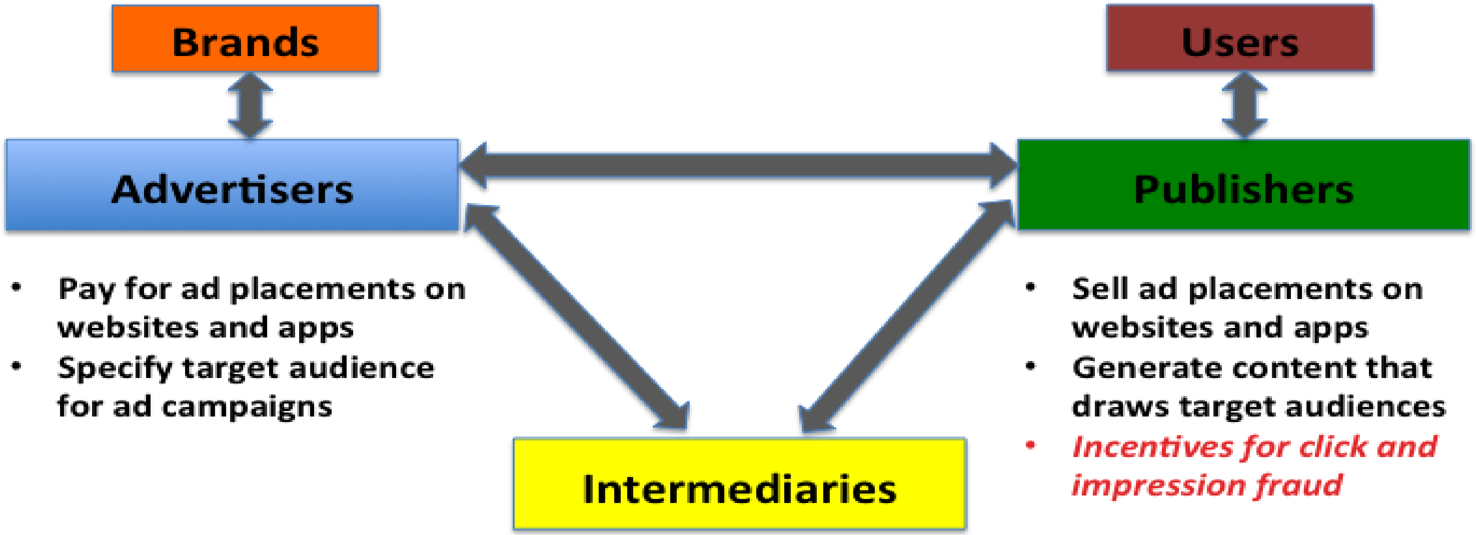
http://www.google.com/search?client=safari&rls=en&q=gardening&ie...r_qf.&bvm=bv.48175248,d.aWc&fp=7fb6ed4322333f43&biw=1115&bih=456 Page 1 of 2

c. 2000 – CPC adwords



Today – CPM display ads

The online ad ecosystem



Brands

Users

Advertisers

Publishers

Intermediaries

Advertisers

- Pay for ad placements on websites and apps
- Specify target audience for ad campaigns

Publishers

- Sell ad placements on websites and apps
- Generate content that draws target audiences
- *Incentives for click and impression fraud*

Intermediaries

- Receive payment for each ad placed
- Facilitate ad placements
- Examples: ad servers, ad exchanges, etc.
- *Incentives for click and impression fraud*

Threats

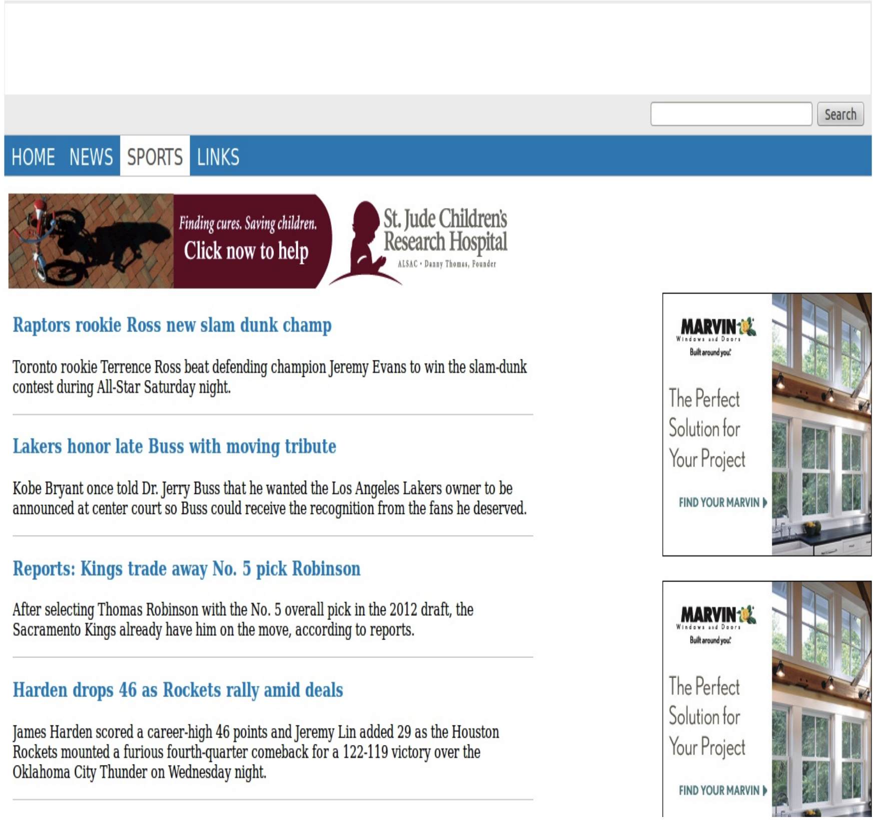
- Simple threats: script-based page retrieval
  - Ubiquitous - $12/10K impressions
- Mechanical turk
  - Humans who are paid (or requested) to access sites
- More complex threats: botnets
  - Geotargeting, clicks, and other characteristics
  - As much as $100/10K impressions
- New threats: pay-per-view networks
  - Websites that load 3rd party pages in an obfuscated fashion when accessed by users

Web traffic generation

- Search is the original form of traffic generation
  - Search engine optimization (SEO) is a popular service
- Legitimate forms of traffic generation
  - Adwords
  - Content widgets (*e.g.,* OutBrain)
- Type “purchase web traffic” in Google search
  - MANY traffic generation offerings
  - Wide variety of features (geo, uniques, etc.)
- Investigation of 34 target sites
  - Assurance that “no black hat methods” are used
  - Great deal of repackaging and ambiguous DNS registrations

Honeypot websites

- Series of websites developed to be targets for traffic generation
  - Look and feel of a “real” site
- Instrumentation
  - Gather as much data per access as possible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ALSAC • Danny Thomas, Founder
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The Perfect Solution for Your Project
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MARVIN Windows and Doors
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The Perfect Solution for Your Project
FIND YOUR MARVIN

Raptors rookie Ross new slam dunk champ

Toronto rookie Terrence Ross beat defending champion Jeremy Evans to win the slam-dunk contest during All-Star Saturday night.

Lakers honor late Buss with moving tribute

Kobe Bryant once told Dr. Jerry Buss that he wanted the Los Angeles Lakers owner to be announced at center court so Buss could receive the recognition from the fans he deserved.

Reports: Kings trade away No. 5 pick Robinson

After selecting Thomas Robinson with the No. 5 overall pick in the 2012 draft, the Sacramento Kings already have him on the move, according to reports.

Harden drops 46 as Rockets rally amid deals

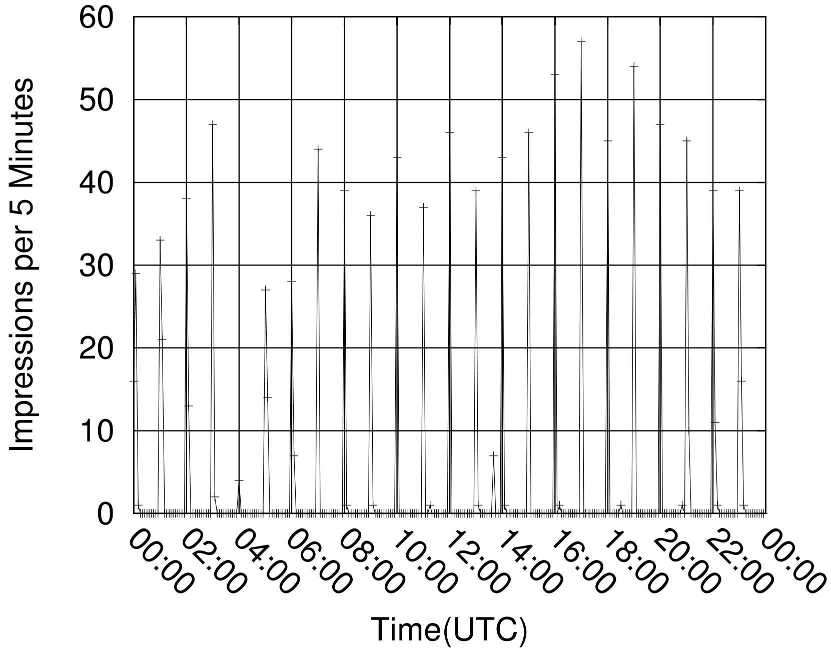
James Harden scored a career-high 46 points and Jeremy Lin added 29 as the Houston Rockets mounted a furious fourth-quarter comeback for a 122-119 victory over the Oklahoma City Thunder on Wednesday night.

Case study traffic purchases

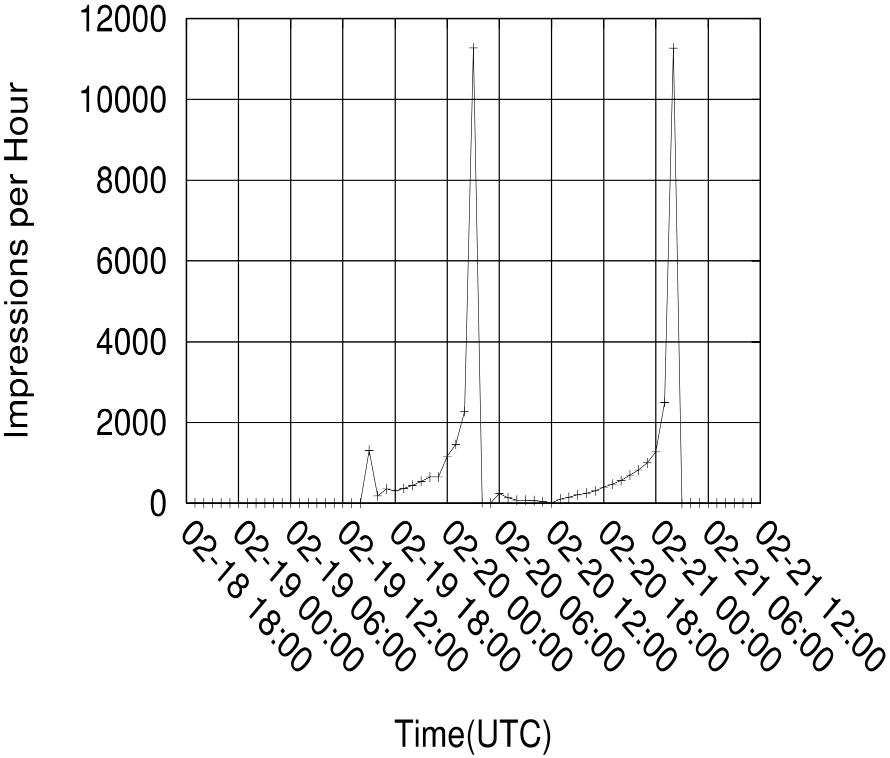
Vendor	Amount	Runtime	Price
MaxVisits	10,000	5 days	$11.99
BuildTraffic	20,000	60 days	$55.00
AeTraffic	10,000	7 days	$39.95
BuyBulkVisitor	20,000	5 days	$53.00
TrafficMasters	50,000	2 days	$70.00

US-based traffic, unique users over 24 hour period

Purchased traffic profiles



BuildTraffic arrival process



TrafficMasters arrival process

Purchased traffic observations

- 69K out of the 110K purchased impressions were delivered
  - BuildTraffic ended 28 days into its 60 day cycle
  - AeTraffic is still delivering at a low level
  - BuyBulkVisitor delivered 1 impression
- Tiny (1%) overlap with public IP blacklists
- Virtually no interactions on our site
- Only modest reuse of IP addresses
- Inconsistent ad loads
- Most traffic was from pop-unders
  - Only 53% of view had non-zero frame size

PPV networks

- Traffic generation objective: look like a real user (and offer features at low price)
- Some TG services offer a simple tag that when included on a site pays attractive CPM
  - “…will not block any of your site content and does not lead to actions where users might be led to leave your site”
  - Tag will “display” 3rd party websites
- PPV network: groups of sites that run tags from a single TG service

Deep dive into PPV nets

- When a user accesses a site running a PPV tag a pop-under window is generated
  - Typically requires a user action
- Pop-under calls PPV network server
  - Delivers details on user and site
- PPV network will deliver URL's of sites buying traffic
  - Often to 0 height frames
  - Frequent reloads

Scope of PPV nets

- Many PPV sites publish their volume
  - Average of 17.16M unique visitors and 6.29B page views per provider per day are claimed
- We identified 10 candidate PPV tags from review of purchased traffic and online forums
- We searched Jan-June ‘12 Common Crawl DB for publisher sites that run PPV tags from 10 providers
  - Javascript checked for pop-under generation
- Over 4M PPV tags found on over 11K domains
  - Largest: ero-advertising.com on 5.8K domains

Impact of PPV nets

- MuStats used to estimate daily page views on identified pages (domains and subdomains)
  - Over 168M estimated daily page views
- Assumptions
  - 25% of pop-unders are blocked
  - 4 destination sites per pop-under
  - Destination sites run 4 ads @ $0.25 CPM
- Over $15M/month in wasted ad spend from 10 PPV networks alone!

Mitigating PPV nets

- Viewport size filters
  - Advertisers or intermediaries that run ad servers can augment their Javascript to check viewport
  - Would filter 46% of impressions in our data
- Referrer blacklist
  - Block traffic originating from PPV networks
  - Would block 99% of our purchased traffic
- Publisher blacklist
  - Identify publishers that participate in PPV nets
  - Block ad requests from those publishers
  - Would discourage publishers from PPV nets

Summary and status

- Fraud is a huge problem in online advertising
  - From simple scripts to sophisticated bots to PPV networks
- Ongoing honeypot-based data gathering
- m.Labs has developed TQ platform to identify fraud
- m.Labs open experimental platform
  - Data repository and API for ad fraud detection
- New directions for data gathering and fraud analysis

Thank you!

- Paul Barford
- Broadcast Interactive Media

- Kevin Springborn (kevin@mdotlabs.com)