

Who's Watching?



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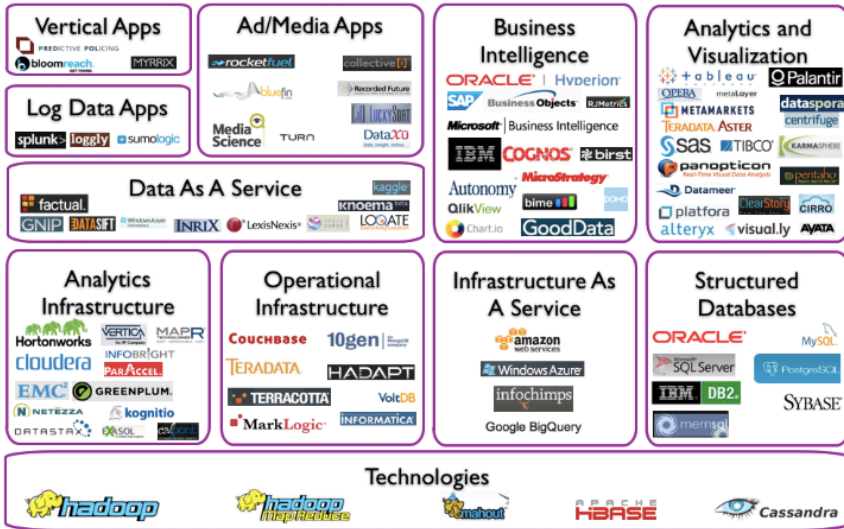


Street Art: Banksy

Geoff Huston, APNIC



# Big Data Landscape



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dave@vcldave.com

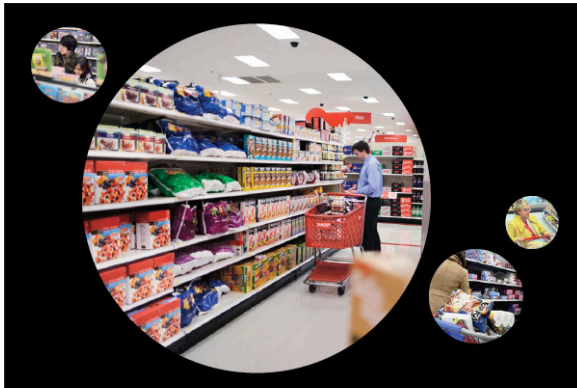
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## How Companies Learn Your Secrets



Antonio Bello/Reportage for The New York Times

By CHARLES DUHIGG  
Published: February 16, 2012 | 570 Comments

Andrew Pole had just started working as a statistician for Target in 2002, when two colleagues from the marketing department stopped by his desk to ask an odd question: "If we wanted to figure out if a customer is pregnant, even if she didn't want us to know, can you do that?"

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## Telstra says it's not spying on users

Powered by SC Magazine SC

By SC Australia Staff on Jun 21, 2012 8:37 PM

Filed under Security

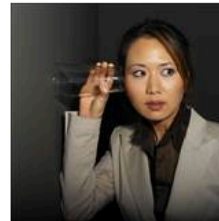
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0 Comments



### Odd logs set alarm bells ringing.

Telstra's wireless network boffins have moved to douse online suspicion the company was surreptitiously tracking web sites visited by its mobile phone customers.

The commentary erupted on telecommunications forum Whirlpool after a user reported strange activity on their web server. They claimed a US IP address had logged the web sites seconds after they were visited by a number of Telstra handsets.

#### Tags

telstra, mobiles, privacy

Phones from other carriers were reportedly unaffected. The rumours of unethical tracking reached fervour pitch when multiple users reported the same activity.

#### Related Articles

- Auditor puts big IT projects on notice
- Telstra offers first funding lifeline to NICTA
- US Govt prepares arrival of new online privacy strategy

But in a short statement, Telstra's senior media boss Craig Middleton said the company's wireless network management assured that "there is nothing untoward in what the Whirlpool member has observed - it is a normal network operation".

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# It's all about YOU

These days technology has managed to create a mass market of customized individual markets - the market of one is now achievable, where each individual can be identified and targeted with products tailored to the individual's perceived needs

And much of this intelligence is gathered by observing your online activities.

And it appears that online data gathering is a widespread practice involving businesses, finance organizations, internet service providers and government agencies

Some of this intelligence gathering is explicit, while other forms are more covert.

Can we observe this activity?



# The Theory

At APNIC we measurement aspects of technology deployment by using Google Ads to deliver a test script to a very large profile of users

- We measure penetration of DNSSEC and IPv6, and many other aspects of the end user's view of the Internet through these scripts
- We have some 500,000 tests executed per day
- And each of them use uniquely generated URLs
- And the URLs direct the end user back to our servers
- **So, in theory we should see each unique URL retrieved from our server exactly once**

# The Theory

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- **So, in theory we should see each unique URL retrieved from our server exactly once**

Right?



# Here's what we see in the web logs...

[22/Jan/2014:00:10:21 +0000]

120.194.53.xxx

"GET /1x1.png?t10000.u3697062917.s1390349413.i333.v1794.rd.td

# Here's what we see in the web logs...

[22/Jan/2014:00:10:21 +0000]

120.194.53.0

"GET /1x1.png?t10000.u3697062917.s1390349413.i333.v1794.rd.td



10:21 120.194.53.0 – Origin AS = 24445

CMNET-V4HENAN-AS-AP Henan Mobile Communications Co.,Ltd



# Here's what we see in the web logs...

```
[22/Jan/2014:00:10:21 +0000]
```

```
120.194.53.0
```

```
"GET /1x1.png?t10000.u3697062917.s1390349413.i333.v1794.rd.td
```

```
[22/Jan/2014:00:11:29 +0000]
```

```
221.176.4.0
```

```
"GET /1x1.png?t10000.u3697062917.s1390349413.i333.v1794.rd.td
```

# Here's what we see in the web logs...

[22/Jan/2014:00:10:21 +0000]

120.194.53.xxx

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[22/Jan/2014:00:11:29 +0000]

221.176.4.xxx

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10:21 120.194.53.0 – Origin AS = 24445

CMNET-V4HENAN-AS-AP Henan Mobile Communications Co.,Ltd

*68 seconds later -- SAME URL, different IP!*

11:29 221.176.4.0 – Origin AS = 9808

CMNET-GD Guangdong Mobile Communication Co.Ltd.

# Searching for Stalkers

We've combed over our collected data since the start of 2014 to see what evidence we can gather about URL stalking...

# Some Stalker Numbers

In the first 248 days of 2014 we saw:

- 123,110,633 unique end-user IP addresses presented to our servers from these test scripts
- 317,309 of these end-user IP addresses presented HTTP GET strings to us that were subsequently presented to us from a different client IP address!

That's some **1 in 400\*** users that seem to have attracted some kind of digital stalker!

\* Or maybe a bit more, due to NATs hiding multiple end users behind a single public IP address





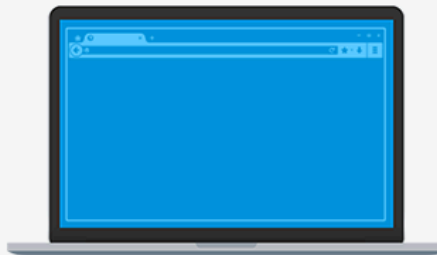
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what's new »



# Committed to you, your privacy and an open Web

## Keep your Firefox in Sync

Access your bookmarks, passwords  
and more from any device.



Get started with Sync

*Create an account from the menu panel*

# Online Privacy? Really?

It's hard to believe that today's Internet respects personal privacy when it seems that around 1 in 400 users have attracted some kind of digital stalker that tracks the URLs they visit.

# Stalking Rates by Country

CC	Samples	stalked	Rate/1,000,000	Country
IR	674	111	164,688	Iran (Islamic Republic of)
LA	28,506	2,875	100,855	Lao People's Democratic Republic
MO	38,761	2,954	76,210	Macao Special Administrative Region of China
SG	240,188	17,406	72,468	Singapore
HK	486,101	22,136	45,537	Hong Kong Special Administrative Region of China
CN	10,419,638	435,040	41,751	China
GB	872,124	28,845	33,074	United Kingdom of Great Britain and Northern Ireland
TW	1,769,367	36,823	20,811	Taiwan
JP	1,500,779	23,971	15,972	Japan
AU	293,193	4,620	15,757	Australia
US	4,491,711	53,370	11,881	United States of America
MY	1,035,434	10,214	9,864	Malaysia
AL	437,399	4,043	9,243	Albania
CA	947,922	6,244	6,587	Canada
KH	143,886	897	6,234	Cambodia
MM	16,411	97	5,910	Myanmar
MK	458,820	2,214	4,825	The former Yugoslav Republic of Macedonia
BZ	8,139	35	4,300	Belize
MN	57,622	233	4,043	Mongolia
NZ	344,951	1,385	4,015	New Zealand
CV	3,742	14	3,741	Cape Verde
ME	223,005	775	3,475	Montenegro
FJ	14,892	47	3,156	Fiji
SR	44,116	136	3,082	Suriname
AW	11,123	34	3,056	Aruba

The top 25 countries in terms of observed URL stalking rates

# Counting Stalkers

- 431,749,774 unique URLs were presented back to us in this experiment, and we saw some 776,243 URLs that were presented to us more than once, from different source IP addresses
- The subsequent presentations came from 8,309 distinct source networks (/24s)



# Top Stalker Subnets

Rank	IP Net	Count	AVG Delay	AS	Description
1	119.147.146.0	339,855	122.6	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN
2	101.226.33.0	53,181	1,502.2	4812	CHINANET-SH-AP China Telecom (Group),CN
3	180.153.206.0	51,592	1,528.0	4812	CHINANET-SH-AP China Telecom (Group),CN
4	112.64.235.0	33,067	1,470.8	17621	CNCGROUP-SH China Unicom Shanghai network,CN
5	180.153.214.0	32,954	1,468.4	4812	CHINANET-SH-AP China Telecom (Group),CN
6	101.226.66.0	30,863	1,499.3	4812	CHINANET-SH-AP China Telecom (Group),CN
7	180.153.163.0	23,941	1,515.0	4812	CHINANET-SH-AP China Telecom (Group),CN
8	180.153.201.0	22,673	1,562.2	4812	CHINANET-SH-AP China Telecom (Group),CN
9	101.226.89.0	19,337	1,426.4	4812	CHINANET-SH-AP China Telecom (Group),CN
10	221.176.4.0	14,019	855.7	9808	CMNET-GD Guangdong Mobile Communication Co.Ltd.,CN
11	101.226.65.0	13,604	1,519.9	4812	CHINANET-SH-AP China Telecom (Group),CN
12	101.226.51.0	10,226	1,490.8	4812	CHINANET-SH-AP China Telecom (Group),CN
13	112.65.193.0	8,619	1,555.5	17621	CNCGROUP-SH China Unicom Shanghai network,CN
14	66.249.93.0	8,306	31,355.1	15169	GOOGLE - Google Inc.,US
15	180.153.205.0	6,816	1,557.0	4812	CHINANET-SH-AP China Telecom (Group),CN
16	180.153.114.0	6,796	1,550.6	4812	CHINANET-SH-AP China Telecom (Group),CN
17	69.41.14.0	5,724	810.0	47018	CE-BGPAC - Covenant Eyes, Inc.,US
18	66.249.81.0	5,218	38,095.9	15169	GOOGLE - Google Inc.,US
19	66.249.88.0	4,817	31,119.7	15169	GOOGLE - Google Inc.,US
20	66.249.80.0	4,685	24,641.1	15169	GOOGLE - Google Inc.,US
21	222.73.77.0	4,471	1,398.5	4812	CHINANET-SH-AP China Telecom (Group),CN
22	180.153.161.0	4,352	1,470.3	4812	CHINANET-SH-AP China Telecom (Group),CN
23	180.153.211.0	4,271	1,520.9	4812	CHINANET-SH-AP China Telecom (Group),CN
24	66.249.85.0	3,774	23,607.7	15169	GOOGLE - Google Inc.,US
25	93.186.23.0	3,707	37.3	18705	RIMBLACKBERRY - Research In Motion Limited,CA

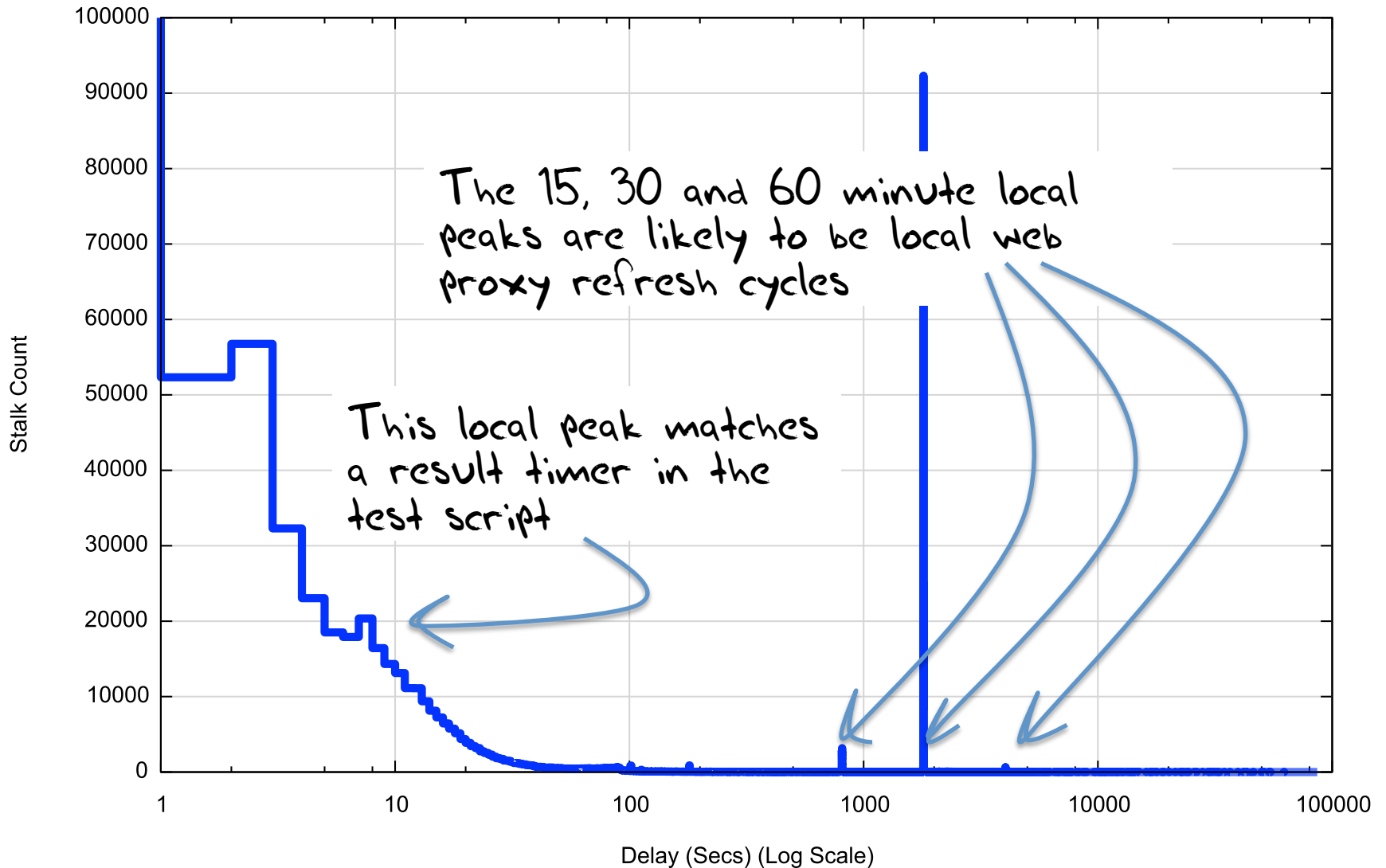
# Is it me ... or you?

A short delay stalking would point to local scriptware on users' browsers that feeds visited URL streams to a third party once the load script has completed

Extended stalking delays of 15, 30 and 60 minutes would indicate that there is some amount of intercepting middleware that feeds proxy web caches

# Stalking Delay

Distribution of Stalking Delay



# Web Proxies

Could this be a variant of a web proxy or active middleware content service that is harvesting URLs off the wire?

- A strong indicator of a local proxy device is that it is located in the same AS as the end client.
- Let's filter that list of URL stalkers and look at those stalkers that use a different Origin AS from the original request
- Here's what we see...



# Different Origin AS Stalkers

Rank	IP Net	#	Avg Delay	AS	Description
1	119.147.146.0	255,121	128.1	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN
2	101.226.33.0	50,257	1,543.3	4812	CHINANET-SH-AP China Telecom (Group),CN
3	180.153.206.0	48,808	1,574.6	4812	CHINANET-SH-AP China Telecom (Group),CN
4	112.64.235.0	32,800	1,507.1	17621	CNCGROUP-SH China Unicom Shanghai network,CN
5	180.153.214.0	31,225	1,519.5	4812	CHINANET-SH-AP China Telecom (Group),CN
6	101.226.66.0	29,188	1,548.2	4812	CHINANET-SH-AP China Telecom (Group),CN
7	180.153.163.0	22,666	1,558.8	4812	CHINANET-SH-AP China Telecom (Group),CN
8	180.153.201.0	21,470	1,609.0	4812	CHINANET-SH-AP China Telecom (Group),CN
9	101.226.89.0	18,233	1,613.2	4812	CHINANET-SH-AP China Telecom (Group),CN
10	101.226.65.0	12,889	1,573.4	4812	CHINANET-SH-AP China Telecom (Group),CN
11	101.226.51.0	9,640	1,542.9	4812	CHINANET-SH-AP China Telecom (Group),CN
12	112.65.193.0	8,531	1,588.3	17621	CNCGROUP-SH China Unicom Shanghai network,CN
13	221.176.4.0	8,324	749.6	9808	CMNET-GD Guangdong Mobile Communication Co.Ltd.,CN
14	180.153.205.0	6,432	1,597.0	4812	CHINANET-SH-AP China Telecom (Group),CN
15	180.153.114.0	6,431	1,591.4	4812	CHINANET-SH-AP China Telecom (Group),CN
16	69.41.14.0	5,685	825.7	47018	CE-BGPAC - Covenant Eyes, Inc.,US
17	222.73.77.0	4,190	1,442.7	4812	CHINANET-SH-AP China Telecom (Group),CN
18	180.153.161.0	4,120	1,524.6	4812	CHINANET-SH-AP China Telecom (Group),CN
19	180.153.211.0	4,064	1,566.9	4812	CHINANET-SH-AP China Telecom (Group),CN
20	223.27.200.0	2,740	1.8	45796	BBCONNECT-TH-AS-AP BB Connect Co., Ltd.,TH
21	60.190.138.0	2,341	3,600.2	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN
22	64.125.188.0	2,286	1,517.2	6461	ABOVENET - Abovenet Communications, Inc,US
23	222.73.76.0	2,144	1,595.6	4812	CHINANET-SH-AP China Telecom (Group),CN
24	101.226.102.0	2,022	1,554.1	4812	CHINANET-SH-AP China Telecom (Group),CN
25	180.153.212.0	2,003	1,450.5	4812	CHINANET-SH-AP China Telecom (Group),CN

# Maybe it's ISP and/or National Infrastructure

- We've all heard about the Great Firewall of China
  - And other countries may be doing similar things
- Possibly this URL stalking is the result of some form of ISP or national content cache program
- Let's filter this list further by using geo-location information to find those cases where the original end client's IP address and the stalker's IP address locate to different countries

# Different Country Stalkers

Rank	IP Net	#	AVG Delay	AS	Description
1	119.147.146.0	205,033	130.7	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN
2	101.226.33.0	6,198	1,576.1	4812	CHINANET-SH-AP China Telecom (Group),CN
3	180.153.206.0	6,120	1,608.3	4812	CHINANET-SH-AP China Telecom (Group),CN
4	180.153.214.0	3,827	1,561.0	4812	CHINANET-SH-AP China Telecom (Group),CN
5	112.64.235.0	3,819	1,544.9	17621	CNCGROUP-SH China Unicom Shanghai network,CN
6	101.226.66.0	3,603	1,577.3	4812	CHINANET-SH-AP China Telecom (Group),CN
7	180.153.163.0	2,742	1,540.1	4812	CHINANET-SH-AP China Telecom (Group),CN
8	223.27.200.0	2,740	1.8	45796	BBCONNECT-TH-AS-AP BB Connect Co., Ltd.,TH
9	101.226.89.0	2,658	2,230.2	4812	CHINANET-SH-AP China Telecom (Group),CN
10	180.153.201.0	2,628	1,549.4	4812	CHINANET-SH-AP China Telecom (Group),CN
11	101.226.65.0	1,528	1,573.3	4812	CHINANET-SH-AP China Telecom (Group),CN
12	69.41.14.0	1,243	1,127.4	47018	CE-BGPAC - Covenant Eyes, Inc.,US
13	101.226.51.0	1,195	1,627.6	4812	CHINANET-SH-AP China Telecom (Group),CN
14	112.65.193.0	1,038	1,623.9	17621	CNCGROUP-SH China Unicom Shanghai network,CN
15	64.124.98.0	906	1,288.9	6461	ABOVENET - Abovenet Communications, Inc,US
16	180.153.114.0	819	1,632.6	4812	CHINANET-SH-AP China Telecom (Group),CN
17	180.153.205.0	765	1,497.7	4812	CHINANET-SH-AP China Telecom (Group),CN
18	208.184.77.0	649	1,419.5	6461	ABOVENET - Abovenet Communications, Inc,US
19	222.73.77.0	535	1,373.8	4812	CHINANET-SH-AP China Telecom (Group),CN
20	180.153.211.0	517	1,450.6	4812	CHINANET-SH-AP China Telecom (Group),CN
21	180.153.161.0	504	1,675.7	4812	CHINANET-SH-AP China Telecom (Group),CN
22	183.60.153.0	262	451.3	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN
23	222.73.76.0	255	1,512.7	4812	CHINANET-SH-AP China Telecom (Group),CN
24	101.226.102.0	235	2,012.7	4812	CHINANET-SH-AP China Telecom (Group),CN
25	208.80.194.0	227	10,731.5	13448	WEBSense - Websense, Inc,US

# Different Country Stalkers

Rank	IP Net	#	AVG Delay	AS	Description
1	119.147.146.0	205,033	130.7	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN
2	101.226.33.0	6,198	1,576.1	4812	CHINANET-SH-AP China Telecom (Group),CN
3	180.153.206.0	6,120	1,608.3	4812	CHINANET-SH-AP China Telecom (Group),CN



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## Smoking gun

From Wikipedia, the free encyclopedia

*For other uses, see [Smoking Gun](#).*

The term "**smoking gun**" was originally, and is still primarily, a reference to an object or fact that serves as evidence. In addition to this, its meaning has evolved in uses completely unrelated to criminal activity: for example, science. A particular hypothesis is sometimes called smoking gun evidence. Its name originally came from the idea of a person on the person of a suspect wanted for shooting someone, which in that situation would be nearly unshakable evidence that falls just short of being conclusive is sometimes referred to as a "smoldering gun."

21	180.153.161.0	504	1,675.7	4812	CHINANET-SH-AP China Telecom (Group),CN
22	183.60.153.0	262	451.3	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN
23	222.73.76.0	255	1,512.7	4812	CHINANET-SH-AP China Telecom (Group),CN
24	101.226.102.0	235	2,012.7	4812	CHINANET-SH-AP China Telecom (Group),CN
25	208.80.194.0	227	10,731.5	13448	WEBSense - Websense, Inc,US

# What are we seeing here?

Do any of the following apply to you? (Answer Yes or No)

- A. **State-based Espionage**  YES  NO
- B. **Compromised Middleware**  YES  NO
- C. **Commercial Espionage**  YES  NO
- D. **Commercial Data Collection**  YES  NO
- E. **Viral Spyware**  YES  NO

Cloud Vitals

**IMPORTANT:** If you have answered "YES" to any of the above,

\_\_\_\_\_  
Family Name (Please Print)

\_\_\_\_\_  
First Name

\_\_\_\_\_  
Country of Citizenship

\_\_\_\_\_  
Date of Birth

**WAIVER OF RIGHTS:** I hereby waive any rights to review or appeal of an immigration officer's determination as to my admissibility, or to contest, other than on the basis of an application for asylum, any action in deportation.

**CERTIFICATION:** I certify that I have read and understand all the questions and statements on this form. The answers I have furnished are true and correct to the best of my knowledge and belief.



**WHAT ARE  
YOU  
LOOKING AT?**



# Where are the Stalked?

CC	Stalk Count	Country
AD	2	Andorra
AE	434	United Arab Emirates
AF	2	Afghanistan
AG	20	Antigua and Barbuda
AL	4032	Albania
AM	161	Armenia
AO	12	Angola
AR	734	Argentina
AT	154	Austria
AU	3463	Australia
AW	15	Aruba
AZ	96	Azerbaijan
BA	969	Bosnia and Herzegovina
BB	40	Barbados
BD	128	Bangladesh
BE	199	Belgium
BF	5	Burkina Faso
BG	2544	Bulgaria
BH	77	Bahrain
BJ	11	Benin
BN	20	Brunei Darussalam
BO	44	Bolivia
BR	995	Brazil
BS	5	Bahamas
BT	4	Bhutan
BW	10	Botswana
BY	58	Belarus
BZ	16	Belize
CA	3164	Canada
CD	5	DR Congo
CG	3	Congo
CH	125	Switzerland
CI	30	Cote d'Ivoire
CL	228	Chile
CM	9	Cameroon
CN	136402	China
CO	945	Colombia
CR	38	Costa Rica
CV	10	Cape Verde
CY	217	Cyprus
CZ	162	Czech Republic
DE	867	Germany
DJ	1	Djibouti
DK	73	Denmark
DO	109	Dominican Republic
DZ	2288	Algeria
EC	232	Ecuador
EE	58	Estonia
EG	1216	Egypt
ES	557	Spain
ET	9	Ethiopia
EU	8	European Union
FI	121	Finland
FJ	25	Fiji
FR	1124	France
GA	7	Gabon
GB	16056	United Kingdom
GE	200	Georgia
GF	1	French Guiana
GH	54	Ghana
GL	4	Greenland
GN	1	Guinea
GQ	10	Equatorial Guinea
GR	965	Greece
GT	18	Guatemala
GU	49	Guam
GY	17	Guyana
HK	17105	Hong Kong
HN	65	Honduras
HR	191	Croatia
HT	6	Haiti
HU	847	Hungary
ID	2103	Indonesia
IE	138	Ireland
IL	548	Israel
IN	1162	India
IQ	1089	Iraq
IR	103	Iran (Islamic Republic of)
IT	958	Italy
JM	54	Jamaica
JO	94	Jordan
JP	23174	Japan
KE	45	Kenya
KG	31	Kyrgyzstan
KH	712	Cambodia
KR	701	Republic of Korea
KW	55	Kuwait
KZ	1048	Kazakhstan
LA	95	Lao People's Democratic Republic
LB	25	Lebanon



# Where are the Stalked?

LK 110 Sri Lanka  
LR 2 Liberia  
LT 302 Lithuania  
LU 10 Luxembourg  
LV 84 Latvia  
LY 52 Libya  
MA 3111 Morocco  
MD 103 Republic of Moldova  
ME 762 Montenegro  
MG 14 Madagascar  
MK 2210 FYR Macedonia  
ML 11 Mali  
MM 62 Myanmar  
MN 134 Mongolia  
MO 2323 Macao  
MP 192 Northern Mariana Islands  
MR 14 Mauritania  
MT 110 Malta  
MU 66 Mauritius  
MW 2 Malawi  
MX 1928 Mexico  
MY 9077 Malaysia  
MZ 6 Mozambique  
NA 11 Namibia  
NC 10 New Caledonia  
NE 7 Niger  
NG 43 Nigeria  
NI 19 Nicaragua  
NL 334 Netherlands  
NO 55 Norway

NP 138 Nepal  
NZ 1012 New Zealand  
OM 59 Oman  
PA 151 Panama  
PE 832 Peru  
PG 4 Papua New Guinea  
PH 3281 Philippines  
PK 1126 Pakistan  
PL 4114 Poland  
PM 2 Saint Pierre and Miquelon  
PR 58 Puerto Rico  
PS 379 Occupied Palestinian Territory  
PT 233 Portugal  
PY 36 Paraguay  
QA 207 Qatar  
RO 2990 Romania  
RS 2672 Serbia  
RU 811 Russian Federation  
RW 9 Rwanda  
SA 685 Saudi Arabia  
SD 22 Sudan  
SE 135 Sweden  
SG 16350 Singapore  
SI 293 Slovenia  
SK 95 Slovakia  
SM 1 San Marino  
SN 74 Senegal  
SR 114 Suriname  
ST 10 Sao Tome and Principe  
SV 45 El Salvador

SY 22 Syrian Arab Republic  
TG 6 Togo  
TH 4529 Thailand  
TJ 10 Tajikistan  
TN 356 Tunisia  
TR 3465 Turkey  
TT 48 Trinidad and Tobago  
TW 29247 Taiwan  
TZ 14 Tanzania  
UA 486 Ukraine  
UG 16 Uganda  
US 8524 United States of America  
UY 62 Uruguay  
VE 400 Venezuela  
VN 9191 Vietnam  
VU 1 Vanuatu  
WS 2 Samoa  
YE 55 Yemen  
ZA 91 South Africa  
ZM 4 Zambia  
ZW 7 Zimbabwe

# Where are the Stalked?

- This is an impressive list of countries
  - Which says a lot about the ubiquity of Google Ads!
  - But it also says a lot about the reach of the particular stalking activity we are seeing here
- Is this list skewed towards any particular country?

# Where are the stalked?

CN 136402 China  
TW 29247 Taiwan  
JP 23174 Japan  
HK 17105 Hong Kong Special Administrative Region of China  
SG 16350 Singapore  
GB 16056 United Kingdom of Great Britain and Northern Ireland  
VN 9191 Vietnam  
MY 9077 Malaysia  
US 8524 United States of America  
TH 4529 Thailand  
PL 4114 Poland  
AL 4032 Albania  
TR 3465 Turkey  
AU 3463 Australia  
PH 3281 Philippines  
CA 3164 Canada  
MA 3111 Morocco  
RO 2990 Romania  
RS 2672 Serbia  
BG 2544 Bulgaria  
MO 2323 Macao Special Administrative Region of China  
DZ 2288 Algeria  
MK 2210 The former Yugoslav Republic of Macedonia  
ID 2103 Indonesia  
MX 1928 Mexico

*This is the top 25 countries where we have observed end systems that appear to have attracted this particular stalker*

# Where are the stalked?

CC	Stalked	URLs	Rate/100000	Country
MO	2,323	131,601	1,765	Macao
HK	17,105	1,949,495	877	Hong Kong
MP	192	24,549	782	Northern Mariana Islands
CN	136,402	23,949,516	569	China
ST	10	2,081	480	Sao Tome and Principe
TW	29,247	6,176,517	473	Taiwan
JP	23,174	5,165,103	448	Japan
GQ	10	4,039	247	Equatorial Guinea
AL	4,032	1,674,691	240	Albania
GL	4	1,746	229	Greenland
MY	9,077	3,979,009	228	Malaysia
MK	2,210	1,121,630	197	The former Yugoslav Republic of Macedonia
SG	16,350	9,452,589	172	Singapore
KH	712	417,028	170	Cambodia
NE	7	4,913	142	Niger
ME	762	589,540	129	Montenegro
WS	2	1,635	122	Samoa
IR	103	86,224	119	Iran (Islamic Republic of)
LA	95	87,071	109	Lao People's Democratic Republic
SR	114	119,539	95	Suriname
CA	3,164	3,550,951	89	Canada
MA	3,111	3,779,870	82	Morocco
PG	4	4,901	81	Papua New Guinea
BJ	11	13,459	81	Benin
GB	16,056	20,069,870	80	United Kingdom of Great Britain and Northern Ireland

This is the top 25 countries with the highest **relative** rate of stalking from this particular stalker

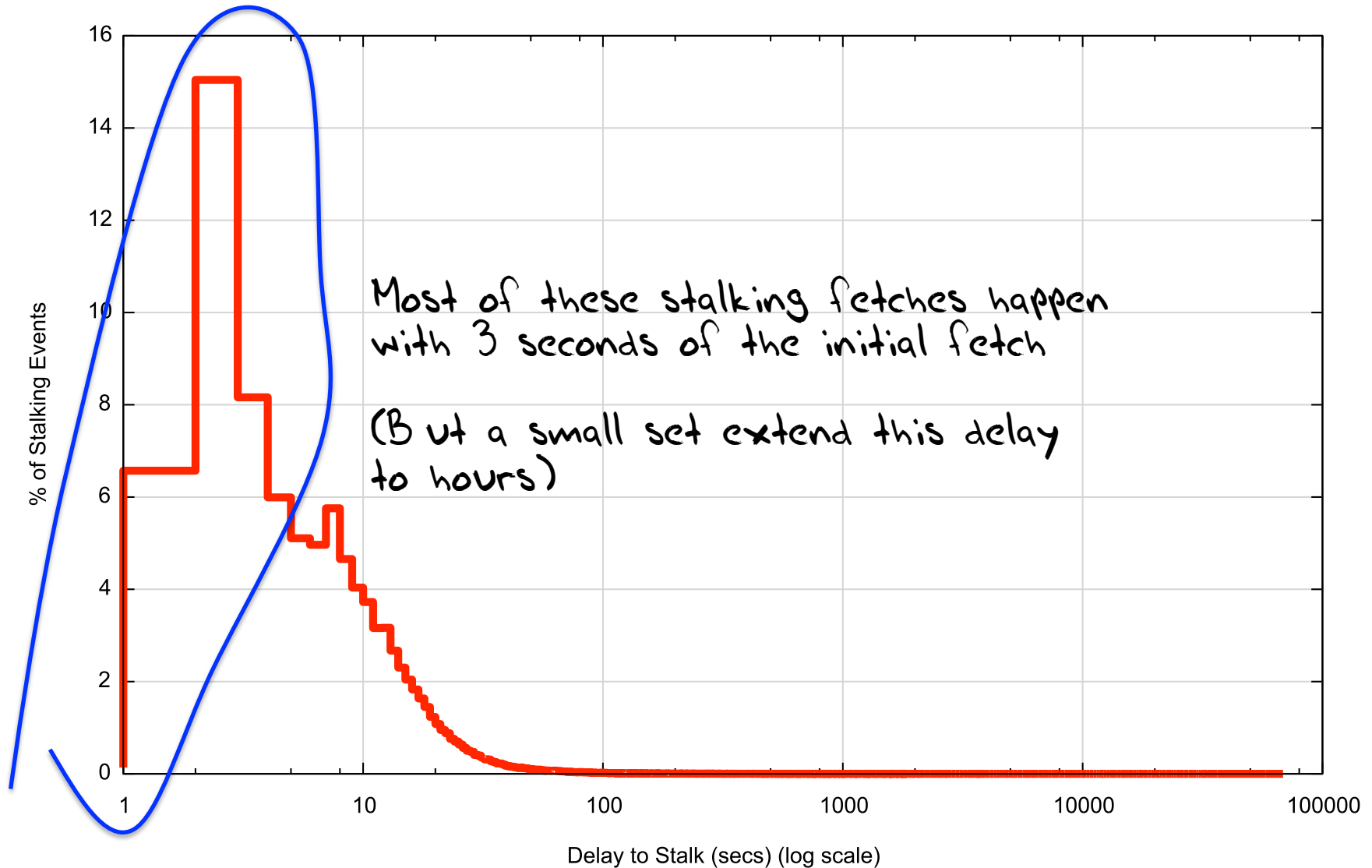
# Stalking Delay Distribution

Is this stalking instant, or delayed?

- The average interval between the initial URL fetch and the second fetch from this net is 74 seconds.  
What's the distribution in delay times?

# Distribution of Stalking Delay

Distribution of Stalking Delay for 119.147.146.0/24



# User Agent strings

- What User Agent string is used by the stalker?
- What User Agent strings are used by the stalked?



# The Stalker's User Agent String

Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 2.0.50727; MAXTHON 2.0)

The screenshot shows the Maxthon website homepage. At the top, there is a navigation bar with the Maxthon logo and links for Home, Product, Maxthon Passport, Community, About, and Support. The main headline reads "Maxthon's Cloud Browser Sets You Free" with a "Powered by C4" badge. Below the headline is a diagram of a cloud browser ecosystem with a central cloud icon, a smartphone, a desktop monitor, and a tablet, all connected by yellow lines. A blue button labeled "Free Download" with a dropdown arrow and "Maxthon for Mac" is positioned below the diagram. At the bottom, there are links for "More Devices iPhone/iPad, Windows, Android, Windows Phone, Linux." and "More Features -".

maxthon Home Product Maxthon Passport Community About Support

Maxthon's Cloud Browser Sets You Free

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More Devices iPhone/iPad, Windows, Android, Windows Phone, Linux.

More Features -

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3,265 Mozilla/5.0 (Windows NT 6.1; WOW64; rv:26.0) Gecko/20100101 Firefox/26.0  
3,084 Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/32.0.1700.107 Safari/537.36  
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1,876 Mozilla/5.0 (Windows NT 6.1; rv:27.0) Gecko/20100101 Firefox/27.0  
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1,813 Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/32.0.1700.102 Safari/537.36

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Many of the stalked end systems appear to be using Windows OS platforms!

# Top 25 User Agent Strings of the stalked systems

6,068 Mozilla/5.0 (Windows NT 5.1) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/28.0.1500.95 Safari/537.36 SE 2.X MetaSr 1.0  
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Many of the stalked users browser  
appears to be Chrome!



# Chrome/Windows Virus?



Are we seeing some viral spyware virus in Chrome & Windows?



# Chrome/Windows Virus?



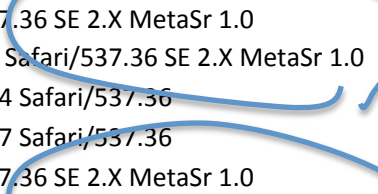
Are we seeing some viral spyware virus in Chrome & Windows?

I don't think that's the case

Let's look at those browser User Agent strings again...

# Top 25 User Agent Strings of the stalked systems

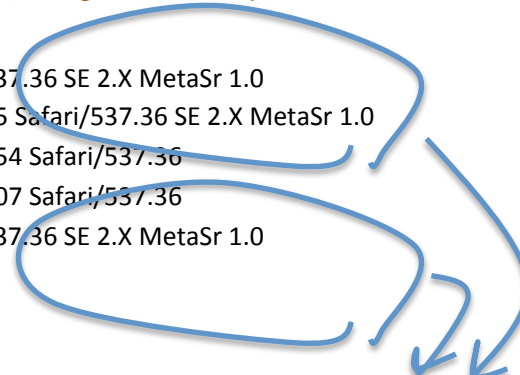
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User Agent = "MetaSR"

# Top 25 User Agent Strings of the stalked systems

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Sogou Explorer 2.X

User Agent = "MetaSR"

## Sogou

From Wikipedia, the free encyclopedia

*For the Japanese department store, see Sogo.*

**Sogou, Inc.** is a subsidiary of **Sohu.com, Inc.** founded on 9 August 2010. It is the owner and developer of **Sogou** (Chinese: 搜狗; pinyin: Sōgǒu; literally: "Search dog") search engine, Sogou Input and Sogou browser.

Contents [show]

### Products [edit]

#### Search engine and web applications [edit]

Sogou search engine (Sogou.com) was launched on 3 August 2004.

Sogou's web application products are designed to classify on-line information, such as music, picture, video clip, news, map and vertical information.

#### Sogou Input [edit]

*Main article: Sogou Pinyin*

Initially released in 2006, Sogou Pinyin is the most popular Chinese input software in China. It makes use of its search engine techniques which are the analysis and categorization of the most popular words or phrases on the Internet.

#### Sogou browser [edit]

Started in December 2008, **Sogou browser** adopts a "dual-core" (Google Chrome's WebKit and Internet Explorer's Trident layout engines) techniques and it connects to the cloud to recognize malicious websites and software.

#### Investment [edit]

On 17 September 2013, it was announced that **Tencent** has invested \$448 million for a minority share in Chinese search engine Sogou.com, the subsidiary of **Sohu, Inc.**<sup>[2]</sup>

#### Sogou, Inc. 搜狗公司

<b>Type</b>	Public company, subsidiary
<b>Founded</b>	9 August 2010; 3 years ago
<b>Headquarters</b>	Beijing, China
<b>Industry</b>	Internet
<b>Website</b>	<a href="http://Sogou.com">Sogou.com</a> <span>[</span> g <span>]</span>

#### Sogou 搜狗

<b>Website screenshot</b> <span>[</span> show <span>]</span>	
<b>Web address</b>	<a href="http://www.sogou.com">www.sogou.com</a> <span>[</span> g <span>]</span>
<b>Commercial?</b>	yes
<b>Available language(s)</b>	Chinese
<b>Users</b>	400 million
<b>Owner</b>	Sogou, Inc. (subsidiary of Sohu, Inc.)
<b>Launched</b>	4 August 2004; 9 years ago
<b>Alexa rank</b>	<span>▲</span> 137 (April 2014) <sup>[1]</sup>
<b>Current status</b>	Active

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Type	Public company, subsidiary
Founded	9 August 2010; 3 years ago
Headquarters	Beijing, China
Industry	Internet
Website	Sogou.com <span>[</span> g <span>]</span>

Sogou 搜狗	
Website screenshot <span>[</span> show <span>]</span>	
Web address	www.sogou.com <span>[</span> g <span>]</span>
Commercial?	yes
Available language(s)	Chinese
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Launched	4 August 2004; 9 years ago
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Current status	Active

"It connects to the cloud to recognize malicious websites and software"

What are we seeing for stalking from 119.147.146.0/24?

Do any of the following apply to you? (Answer Yes or No)

- A. State-based Espionage  YES  NO
- B. Compromised Middleware  YES  NO
- C. Commercial Espionage  YES  NO
- D. Commercial Data Collection  YES  NO
- E. Viral Spyware  YES  NO
- F. Cloud Mania  YES  NO

IMPORTANT: If you have answered "YES" to any of the above,

\_\_\_\_\_  
Family Name (Please Print)

\_\_\_\_\_  
First Name

\_\_\_\_\_  
Country of Citizenship

\_\_\_\_\_  
Date of Birth

**WAIVER OF RIGHTS:** I hereby waive any rights to review or appeal of an immigration officer's determination as to my admissibility, or to contest, other than on the basis of an application for asylum, any action in deportation.

**CERTIFICATION:** I certify that I have read and understand all the questions and statements on this form. The answers I have furnished are true and correct to the best of my knowledge and belief.

What are we seeing for stalking from 119.147.146.0/24?

Do any of the following apply to you? (Answer Yes or No)

- A. State-based Espionage  YES  NO
- B. Compromised Middleware  YES  NO
- C. Commercial Espionage  YES  NO
- D. Commercial Data Collection  YES  NO
- E. Viral Spyware  YES  NO
- F. Cloud Mania  YES  NO

IMPORTANT: If you have answered "YES" to any of the above,

\_\_\_\_\_  
Family Name (Please Print)

\_\_\_\_\_  
First Name

\_\_\_\_\_  
Country of Citizenship

\_\_\_\_\_  
Date of Birth

**WAIVER OF RIGHTS:** I hereby waive any rights to review or appeal of an immigration officer's determination as to my admissibility, or to contest, other than on the basis of an application for asylum, any action in deportation.

**CERTIFICATION:** I certify that I have read and understand all the questions and statements on this form. The answers I have furnished are true and correct to the best of my knowledge and belief.

This data set is just a tiny glimpse into the overall pattern of web activity



What's happening in the larger world of various forms of tracking users' behaviour on the Internet?



Street Art: Banksy



In today's Internet users' browsing history is being siphoned off to third parties as a commonplace activity.

Who gets to see this data of user browsing behaviour? Within which national regime? Within which constraints of privacy?

Is this form of digital stalking something that we are comfortable with?

Or are we even aware that it is happening at all?



# Thanks to:

George Michaelson and Byron Ellacot of APNIC  
for developing the Ad Measurement Experiment

Warren Kumari, of Google, who spent some time  
looking through user agent strings to identify a  
pointer to the Sogou browser in the collected data.

Thanks!

Brinngg!

Brinngg!

Oh no... my tap's  
been phoned

