



# LEVITATION and the FFU Hypothesis



██████████  
██████████ @cse-cst.gc.ca



# What is LEVITATION?

- A behaviour-based target discovery project
- Multi-disciplinary team
- Prototyping and delivering advances in:
  - Behavioural tradecraft
  - Hypothesis tradecraft
  - Tradecraft automation





# Current Hypotheses

## Active

FFU

[REDACTED]

[REDACTED]

[REDACTED]

Sequential numbers

Obvious selector names

Web search terms

## In Development

GPS waypoints

Devices close to places

Telephony gaps

[REDACTED]

Targets of foreign SIGINT agencies

Missed calls

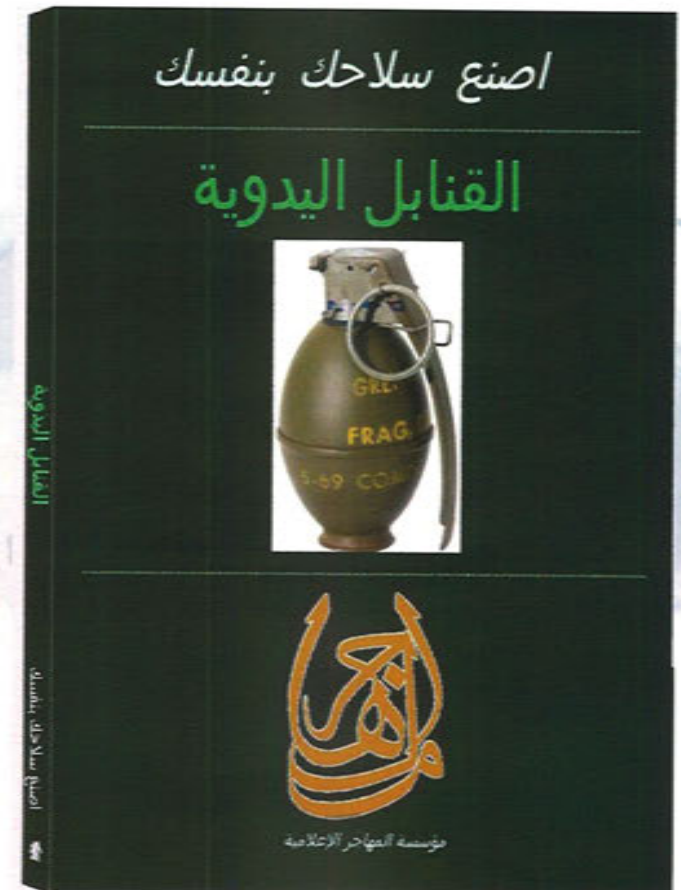


# FFU Hypothesis

**Extremists use Free File Upload (FFU) sites differently than the general public.**

Al-Qaida uses FFU sites to distribute Jihadist propaganda

Extremists use FFU sites to distribute training materials





# What do we need?

A list of suspect documents

A list of FFU URLs referring to those documents

A list of IPs downloading those URLs

New documents are found by CWOC (CSEC Web Operations Centre) retrieval from URLs, so that's the easy part.



# New URLs

CSEC's web forums team  
2<sup>nd</sup> Party reports & alerts

## Machine Learning

Learning the textual  
context for the URLs in  
web forums

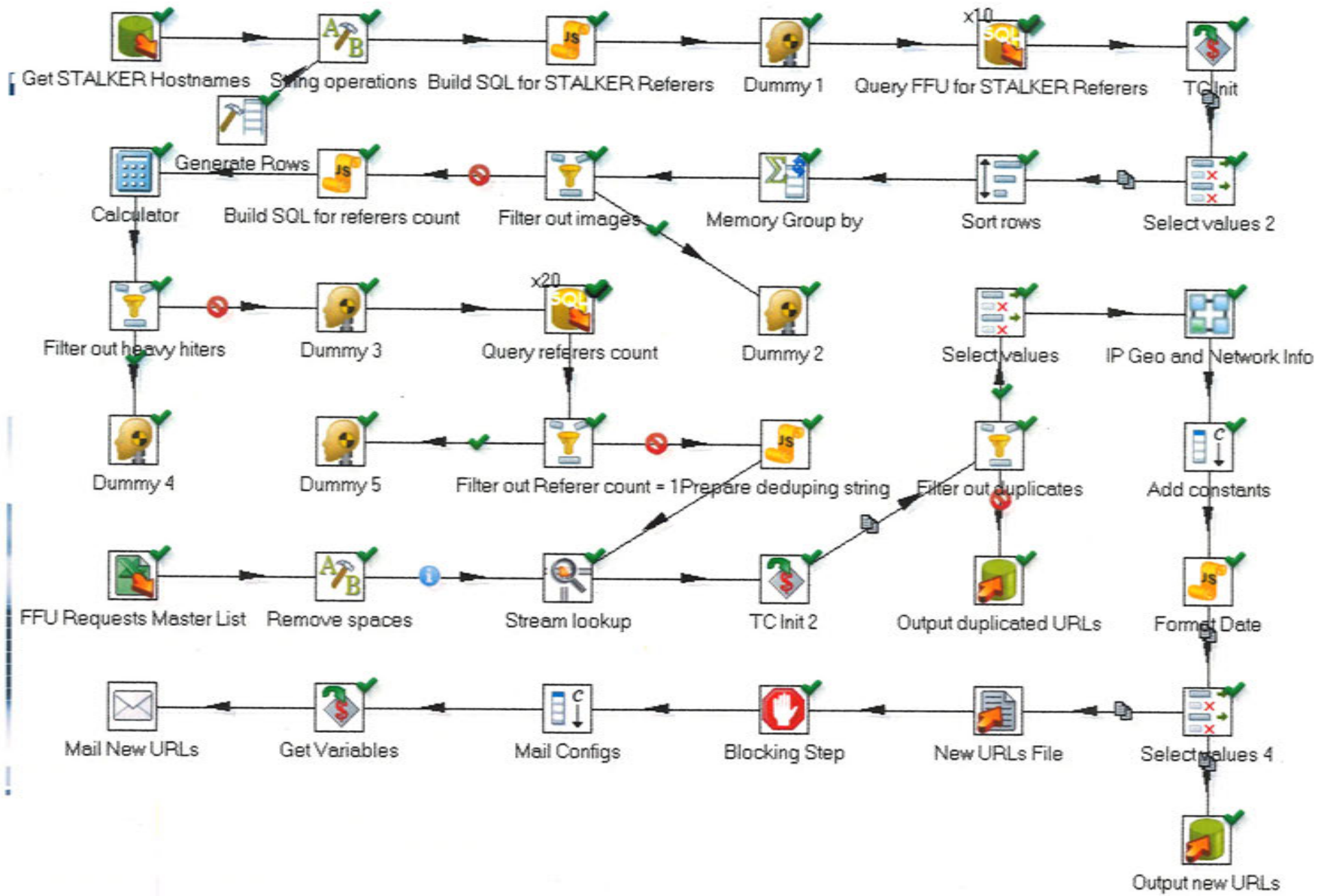
## HTTP Referrers

Follow URL referrers back  
to the originating site

Previous Correlations  
analysis

Using tech techniques to  
figure out what else that  
user was up to at the  
same time

e.g. Google analytics  
cookies





# FFU Events Collection

ATOMIC BANJO (Special Source) is collecting HTTP metadata for 102 known FFU sites.



sendspace



MEGAUPLOAD

We see about 10-15 million FFU events per day  
All the FFU Events are available thru OLYMPIA



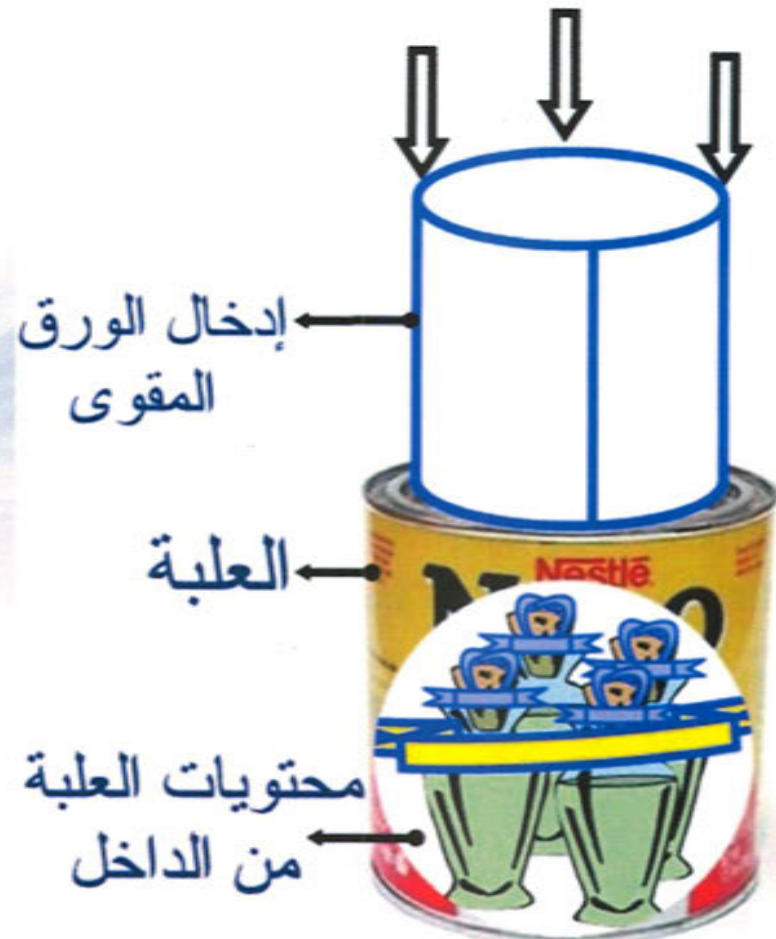
# Looking for a few good documents

We only care about the 2,200 URLs that point to documents of interest.

e.g. How to make a gas bomb  
[www.sendspace.com/file/██████████](http://www.sendspace.com/file/██████████)

Every day we sort through the 10–15M events for the interesting ones.

We're finding about 350 interesting download events per month.



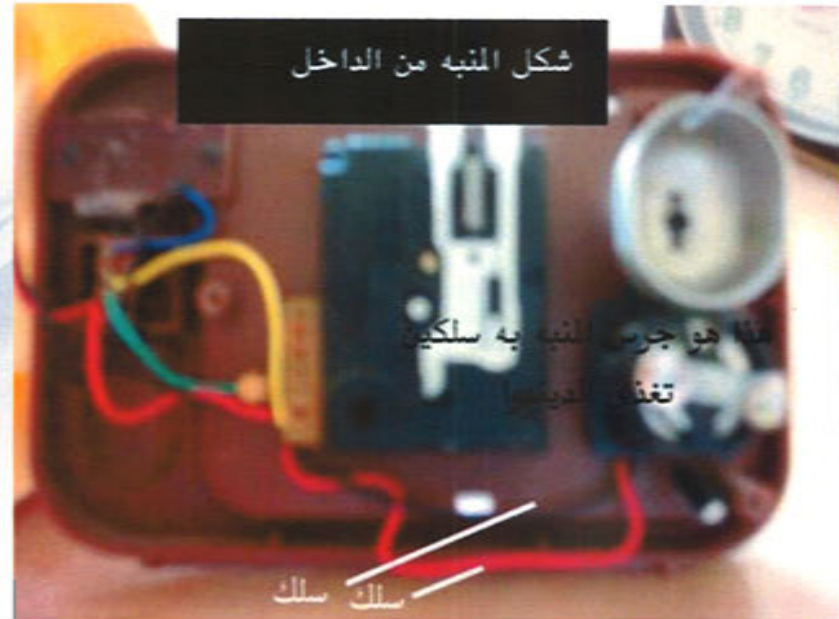


# Documents vary

**Chloroform in a Lowes bucket**



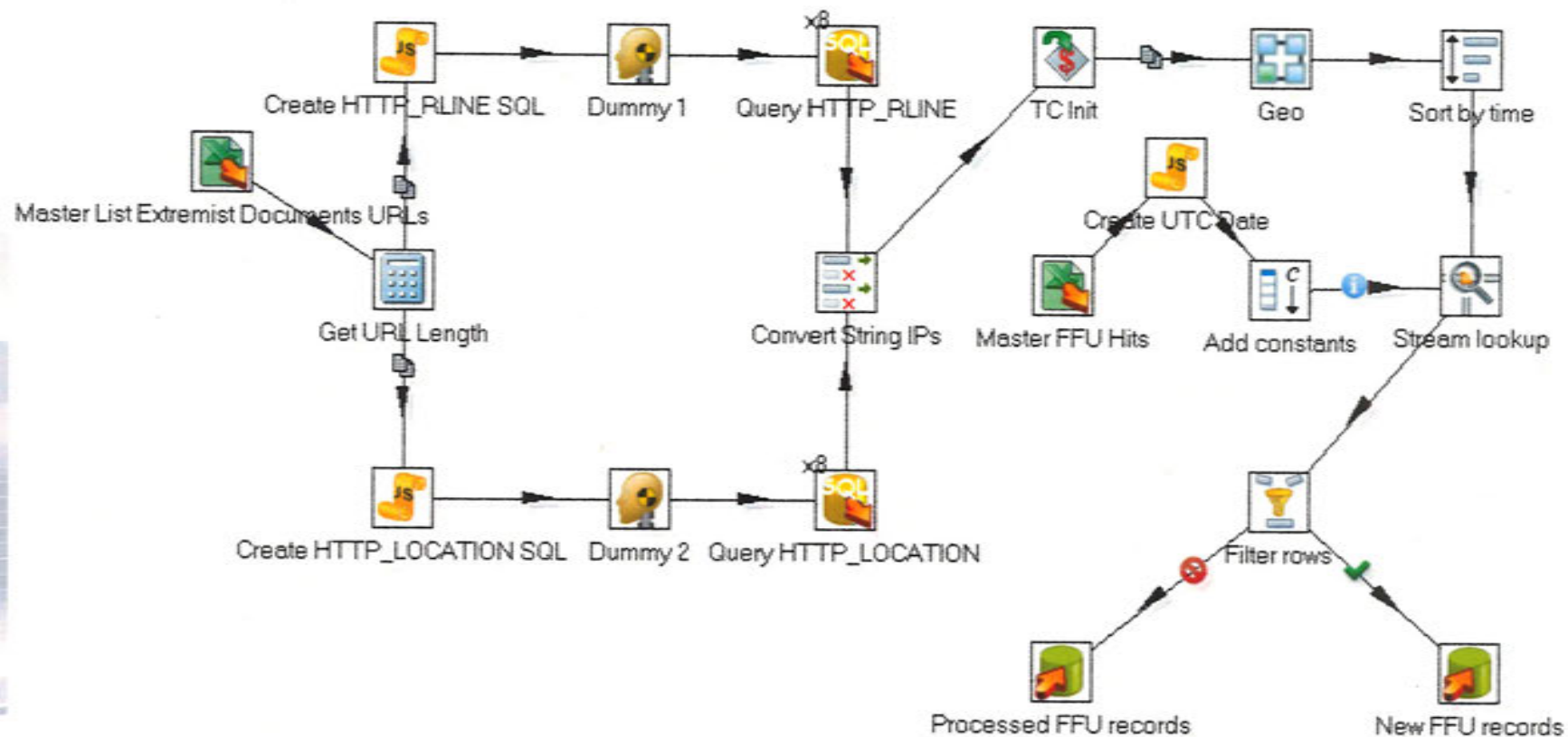
**Bajadin Explosives Manual**



**And lots of pictures of cars on fire**



# Filtering out Glee Episodes





# Resulting events

FFU Hits

Computer > shares (\\corp) (R) > Share\_1 > Levitation > FFU > FFU Hits

File Edit View Tools Help

Organize Open New folder

Search FFU Hits

Name	Date modified	Type	Size
01-20-2012 FFU Hit Selector [REDACTED] Iraq	06/03/2012 10:27 AM	File folder	
01-20-2012 FFU Hit Selector [REDACTED] Iraq	06/03/2012 8:32 AM	File folder	
01-20-2012 FFU Hit Selector [REDACTED] Saudi Arabia	07/03/2012 12:15 PM	File folder	
01-21-2012 FFU Hit Selector [REDACTED] Yemen	19/03/2012 11:47 AM	File folder	
01-21-2012 FFU Hit Selector [REDACTED] Occupied Palestinian Territory	08/03/2012 10:36 AM	File folder	
01-21-2012 FFU Hit Selector [REDACTED] Saudi Arabia	19/03/2012 1:43 PM	File folder	
01-22-2012 FFU Hit Selector [REDACTED] Occupied Palestinian Territory	07/03/2012 12:15 PM	File folder	
01-23-2012 FFU Hit Selector [REDACTED] Oman	09/03/2012 10:41 AM	File folder	
01-25-2012 FFU Hit Selector [REDACTED] Syria	06/03/2012 12:20 PM	File folder	
01-27-2012 FFU Hit Selector [REDACTED] UK	06/03/2012 12:38 PM	File folder	
01-28-2012 FFU Hit Selector [REDACTED] Occupied Palestinian Territory	09/03/2012 10:54 AM	File folder	
01-31-2012 FFU Hit Selector [REDACTED] Syria	05/03/2012 10:26 AM	File folder	
02-01-2012 FFU Hit Selector [REDACTED] US	05/03/2012 10:36 AM	File folder	
02-02-2012 FFU Hit Selector [REDACTED] Spain	07/03/2012 12:17 PM	File folder	
02-06-2012 FFU Hit Selector [REDACTED] Germany	08/03/2012 9:35 AM	File folder	
02-13-2012 FFU Hit Selector [REDACTED] Yemen	23/03/2012 10:02 AM	File folder	
02-13-2012 FFU Hit Selector [REDACTED] US	08/03/2012 9:52 AM	File folder	
02-14-2012 FFU Hit Selector [REDACTED] Kuwait	05/03/2012 10:57 AM	File folder	
02-15-2012 FFU Hit Selector [REDACTED] Senegal	22/03/2012 12:25 PM	File folder	
02-17-2012 FFU Hit Selector [REDACTED] Bahrain	09/03/2012 8:57 AM	File folder	
02-18-2012 FFU Hit Selector [REDACTED] Canadian Anonymizer	05/03/2012 1:05 PM	File folder	
02-20-2012 FFU Hit Selector [REDACTED] Jordan	09/03/2012 8:55 AM	File folder	
02-22-2012 FFU Hit Selector [REDACTED] Morocco	09/03/2012 8:54 AM	File folder	
02-24-2012 FFU Hit Selector [REDACTED] Yemen	09/03/2012 9:50 AM	File folder	
02-26-2012 FFU Hit Selector [REDACTED] Qatar	09/03/2012 2:26 PM	File folder	
02-28-2012 FFU Hit Selector [REDACTED] Kuwait	20/03/2012 9:33 AM	File folder	
02-28-2012 FFU Hit Selector [REDACTED] Brazil	20/03/2012 9:53 AM	File folder	
03-01-2012 FFU Hit Selector [REDACTED] Jordan	22/03/2012 12:45 PM	File folder	
03-03-2012 FFU Hit Selector [REDACTED] Yemen	22/03/2012 1:03 PM	File folder	
03-03-2012 FFU Hit Selector [REDACTED] Portugal	27/03/2012 10:59 AM	File folder	
03-04-2012 FFU Hit Selector [REDACTED] Canadian Anonymizer	22/03/2012 1:29 PM	File folder	
03-07-2012 FFU Hit Selector [REDACTED] Kenya	27/03/2012 12:58 PM	File folder	
03-07-2012 FFU Hit Selector [REDACTED] Yemen	28/03/2012 11:07 AM	File folder	
03-10-2012 FFU Hit Selector [REDACTED] Jordan	28/03/2012 11:13 AM	File folder	
03-16-2012 FFU Hit Selector [REDACTED] Jordan	28/03/2012 1:09 PM	File folder	
03-20-2012 FFU Hit Selector [REDACTED] Morocco	29/03/2012 11:08 AM	File folder	
FFU From Mathieu	09/03/2012 3:02 PM	Microsoft Excel W...	19 KB

01-20-2012 FFU Hit Selector [REDACTED] Date modified: 06/03/2012 10:27 AM Offline status: Online  
File folder Offline availability: Not available



# Start analysis with event info

**FFU hit from selector [REDACTED] on  
7/03/2012 7:46:51 geolocated to Kenya,  
accessing The Explosives Course through  
FFU site sendspace.com with HTTP user  
agent Mozilla/5.0 (Ubuntu; X11; Linux  
x86\_64; rv:9.0.1) Gecko/20100101 Firefox/  
9.0.1**



# Correlating other selectors with the IP

FFU hit from selector [REDACTED] on 7/03/2012 7:46:51 geolocated to Kenya, accessing The Explosives Course through FFU site sendspace.com with HTTP user agent Mozilla/5.0 (Ubuntu; X11; Linux x86\_64; rv:9.0.1) Gecko/20100101 Firefox/9.0.1

? Can we correlate any other selectors with this IP address?

Mutant Broth query on IP [REDACTED] for 5 hours on either side of 7/03/2012 7:46:51

682 events including 77 with an exact match of the user agent above yielding a Facebook ID [REDACTED] a Google Prefid Cookie [REDACTED] an M\_Advxs Uuid2 Cookie [REDACTED] an M\_Quantserve Mc Cookie [REDACTED] and a Google Prefid Cookie [REDACTED]

New Selectors

FFU Hit Selector [REDACTED] March 7, 2012. Mutant Broth query.xlsx



# Correlating Facebook cookie

FFU hit from selector [REDACTED] on 7/03/2012 7:46:51 geolocated to Kenya, accessing The Explosives Course through FFU site sendspace.com with HTTP user agent Mozilla/5.0 (Ubuntu; X11; Linux x86\_64; rv:9.0.1) Gecko/20100101 Firefox/9.0.1

Open Source research indicates that the user of Facebook ID [REDACTED] is based in Dubai, United Arab Emirates

Marina Profile Query on Facebook User Cookie [REDACTED] observed in Mutant Broth Query above

Lots of events including registration email address [REDACTED]@gmail.com and Facebook name [REDACTED]



FFU Hit Selector [REDACTED] March 7, 2012. Marina Profile Query on Facebook ID [REDACTED] [REDACTED]

Mutant Broth Sub-Query on Facebook User Cookie [REDACTED] observed in Mutant Broth Query above

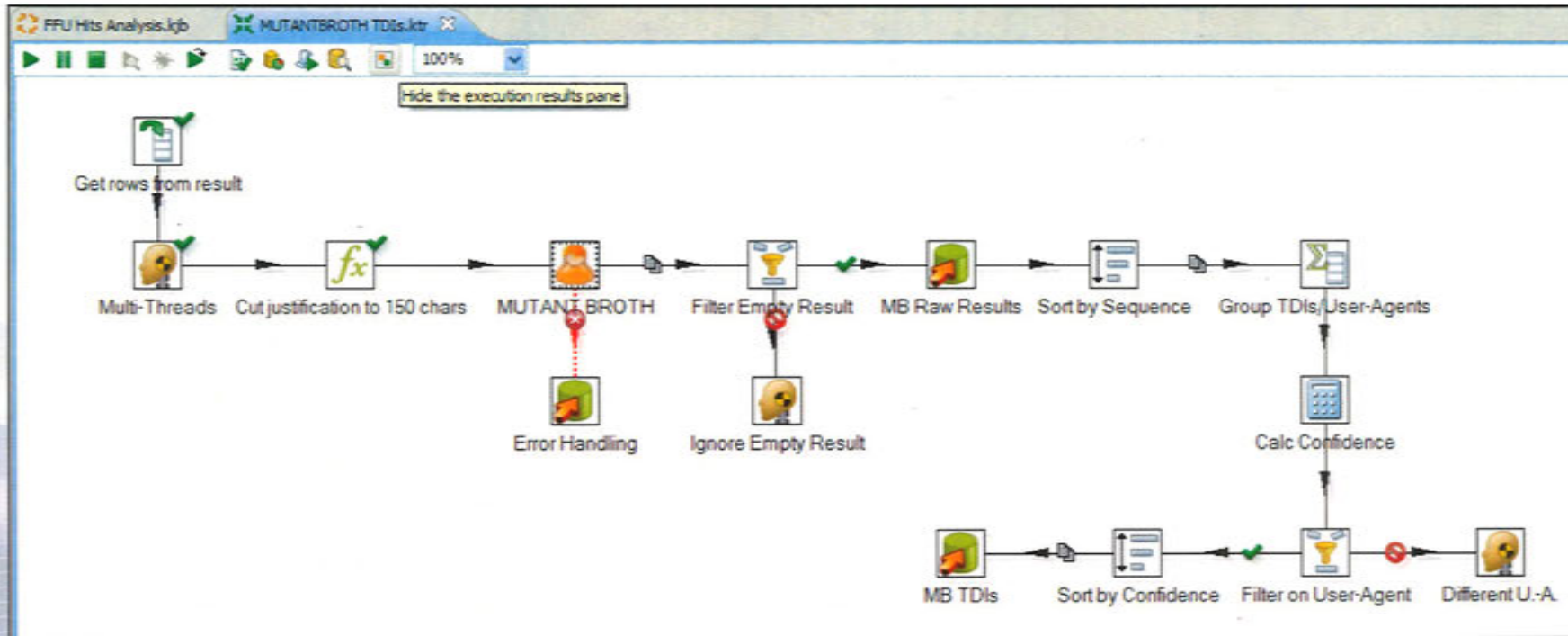
946 events with 893 matching exactly the user agent above

FFU Hit Selector [REDACTED] March 7, 2012. Mutant Broth Sub-Query on Facebook ID [REDACTED] [REDACTED]

? Can we correlate any other selectors with this Facebook ID Cookie?



# IP Correlation



Groups	Document_Link	Document_Title/Description	EVENT_TIMESTAMP	ACTIVITY DATE	Confidence_Number	ACTIVE USER
(27)	archive.org/almapl.mp4	German hostage video	Wed Mar 28 18:32:32 GMT 2012	2012-03-28T18:18:00Z	1.0	
(27)	archive.org/almapl.mp4	German hostage video	Wed Mar 28 18:32:32 GMT 2012	2012-03-28T18:18:00Z	1.0	
(34)	archive.org/almapl.mp4	German hostage video	Wed Mar 28 18:32:32 GMT 2012	2012-03-28T18:18:17Z	1.0	
(12)	archive.org/almapl.mp4	German hostage video	Wed Mar 28 18:32:32 GMT 2012	2012-03-28T18:18:17Z	1.0	
Mozilla/4.0 (compatible; MSIE 6.0; W...	archive.org/almapl.mp4	German hostage video	Wed Mar 28 18:23:42 GMT 2012	2012-03-28T18:09:27Z	0.5	
(2)	archive.org/almapl.mp4	German hostage video	Wed Mar 28 18:23:42 GMT 2012	2012-03-28T18:09:27Z	0.5	
(5)	archive.org/almapl.mp4	German hostage video	Wed Mar 28 18:23:42 GMT 2012	2012-03-28T18:18:00Z	0.5	
Mozilla/4.0 (compatible; MSIE 8.0; W...	archive.org/almapl.mp4	German hostage video	Wed Mar 28 18:23:42 GMT 2012	2012-03-28T18:18:00Z	0.5	
(5)	archive.org/almapl.mp4	German hostage video	Wed Mar 28 18:23:42 GMT 2012	2012-03-28T18:18:00Z	0.5	
(5)	archive.org/almapl.mp4	German hostage video	Wed Mar 28 18:23:42 GMT 2012	2012-03-28T18:18:17Z	0.5	



# Automated analysis documentation

The screenshot displays a software interface with a light blue background. At the top, there are window titles: "Workbook 1", "20120120000848 188.51.88.22 saudi arabia.xmind", and "Create a relationship (Ctrl+L)".

**Analytic Process for FFU Hypothesis Hits**

**FFU hit from selector [redacted] on 20120120000848000GMT geolocated to SA, accessing Inexhaustible weapons part 2 through FFU site GET /download/sela7\_la\_yndb\_02/part24.mp4 HTTP/1.1 with HTTP user agent Mozilla/5.0 (SymbianOS/9.3; U; Series60/3.2 NokiaN79-1/11.049; Profile/MIDP-2.1 Configuration/CLDC-1.1 ) AppleWebKit/413 (KHTML, like Gecko) Safari/413**

**Can we correlate any other selectors with this IP address?**

- Mutant Broth query on IP [redacted] for 5 hours on either side of 20120120000848000GMT
  - [\_MUTANTBROTH\_EVENT\_COUNT\_] events with only [\_MUTANTBROTH\_MATCHING\_EVENT\_COUNT\_] matching exactly the user agent above.
  - New Selector
  - FFU Hit Selector [redacted]
- Marina Activity query on IP [redacted] for 5 hours on either side of 20120120000848000GMT
  - [\_MARINA\_ACTIVITY\_EVENT\_COUNT\_] events with possible correlation [\_MARINA\_ACTIVITY\_POSSIBLE\_CORRELATIONS\_]



# What happens then?

Compare control and experimental groups to show statistical differences

Analyse experimental group to determine statistical power of the hypothesis

Assemble selectors across all hypotheses

Rank selectors according to the number and power of the hypothesis behaviors they show

Deliver an ordered list of suspects to OCT



# Scoreboard

		Hypotheses						
		FFU	████	████	████	...	Totals	
Weights		0.6	0.55	0.52	0.48			
Personae	P1	4	2	0	4			5.42
	P2	4	4	0	1			5.08
	P3	4	1	0	4			4.87
	P4	3	4	4	0			3.14
...								
		Known	New					



## Successes

An HTTP-referred URL gave us a German hostage video from a previously unknown target.

An [REDACTED] FFU upload event gave us an AQIM's hostage strategy. The resulting report was disseminated widely including by the CIA to their counterparts overseas.



# The End

Team Lead:

( [REDACTED]@cse-cst.gc.ca )

Tech Lead:

( [REDACTED]@cse-cst.gc.ca )

Me:

( [REDACTED]@cse-cst.gc.ca )

