FOSSASIA 2016 Singapore **Big Data with Small Messages** Data Indexing and Storage with loklak

Michael Christen M.Sc., mc@yacy.net, @0rb1t3r



t screen_name		t mentions		t hashtags	
Quick Count 1 (151 /151 records)		Quick Count () (151 /151 records)		Quick Count (151 /151 records)	
bobreyes	ତ୍ତ୍ର ପ୍	fossasia	ତ୍ ପ୍	fossasia	ତ୍ ପ୍
fossasia	ତ୍ ପ୍	harishpillay	ତ୍ର ପ୍	mozilla	ତ୍ର ପ୍
downey	ତ୍ତ୍ ପ୍	mariobehling	ତ୍ତ୍ର ପ୍	mozfossasia	ତ୍ର ପ୍
pleia2	ତ୍ତ ପ	ScienceCentreSG	ତ୍ ପ୍	loklak	ତ୍ର ପ୍
4.6% vega_yaa	ତ୍ ପ୍	Orb1t3r	ତ୍ର ପ୍	mozillians	ତ୍ର ପ୍
3.3%		2.0%		1.3%	



WHAT?

LOKLAK is a server application that uses P2P technology for collected data from Twitter and other sources without the need for API keys! It is anonymous and you can create your own search engine to analyse the data. You can easily fetch 1 million tweets in one day! And icing on the cake: it is ANONYMOUS!

ANONYMOUS TWITTER ARCHIVER

DESGINED

WITH <3 FOR

git clone https://github.com/loklak/loklak_server.git

ERE?

ant

cd loklak_server

bin/start.sh



Number of Tweets growth rate

back to top **↑**

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From Twitter's launch in 2006 and until 2009, the volume of tweets grew at increasingly high rates, approaching a 1,400% gain in daily volume year to year ^[2] and around 1,000% gain in yearly volume.

By mid 2010 the rate of growth started to cool down, sliding eventually below 100% gain in yearly volume in 2012. Today, the volume of tweets is growing at around 30% per year in our estimation.



http://www.internetlivestats.com/twitter-statistics/



Success? How many Tweets do we have?



708 Million Tweets in one year = 0.2% of all tweets :(but..



loklak.org



most of the tweets (650 Million) had been collected in the last four months Collection rate now: 0.5% of all Tweets we get every 1 tweet in 200!











Architecture Software and Components





loklak.org

Phase 1 (synchronous): Dispatching the Search Request





Phase 2 (synchronous): Merging the Search Results





Phase 3 (asynchronous): Distribution of Messages









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Dumps

Apps

Fort ne on Cithus

API

Tutorials

Download

Architecture

loklak

Distributed Tweet Search Server

This is the Search Server for the Loklak Webclient hosting 708,739,590 messages for 51,399,969 users. Harvesting Speed: 8 messages per second; 691,200 messages per day.

Home

About

Showcase





Message Search Engine loklak.org **Content Harvester** Search Index Search Portal elasticsearch. other Transport Client -Scraper-Peer-to-Peer Message Dump JSON loklak Lists API -for download-Search Index Search Index elasticsearch. elasticsearch. Node Node **Index Cluster** \odot

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Cluster in Elasticsearch Head

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Cluster in Elasticsearch Head

Connect loklakcluster

loklak.org

Elasticsearch http://host000:9200/

Overview Indices Browser Structured Query [+] Any Request [+]

apps.wall.headerColour

apps.wall.headerPosition

apps.wall.id

apps.wall.images

apps.wall.layoutStyle

apps.wall.logo.base64

apps.wall.logo.filename

apps.wall.logo.filesize

apps.wall.logo.filetype

apps.wall.mainHashtag

apps.wall.none.text

apps.wall.profanity

apps.wall.mainHashtagText

apps.wall.showEventName

apps.wall.showLoklakLogo

apps.wall.showStatistics

apps.wall.sinceDate

apps.wall.untilDate

apps.wall.type

apps.wall.headerForeColour

IN

Browser								Refresh
All Indices 🔹	Searched 1	6 of 16 sha	rds. 15623 hits. 4.975 se	conds				
INDICES	_index	_type	_id	_score	timestamp 🔺	created_at	screen_name	text
.kibana	messages	TWITTER	708821898990235649		2016-03-14T08:27:22.857Z	2016-03-13T01:08:04.000Z	kapper1224	Netwalker Labo FOSSASIA2016 2016/3/20 13:30~ Hacking ARM Mobile Linux presenta
accounts	messages	TWITTER	708909606437662720		2016-03-14T08:27:22.782Z	2016-03-13T06:56:35.000Z	foss_asia	http://fossasia.blogspot.com/
import_profiles	messages	TWITTER	708909607662407680		2016-03-14T08:27:22.772Z	2016-03-13T06:56:36.000Z	foss_asia	http://fossasia.blogspot.com/
messages	messages	TWITTER	708932259554861057		2016-03-14T08:27:22.644Z	2016-03-13T08:26:36.000Z	kedardk	Hearty Congratulations to our dear friend Rahul Mahale who has been invited to FOSSASIA
queries	messages	TWITTER	708976215605047296		2016-03-14T08:27:22.585Z	2016-03-13T11:21:16.000Z	Orb1t3r	@nause_marc @loklak_app @frank_gamefreak AAH I just tested it and its GREAT! Haha fi
users	messages	TWITTER	709053647242432512		2016-03-14T08:27:22.241Z	2016-03-13T16:28:57.000Z	prasad_pitagi	Yahoo got t-shirt from Google for participating in #gci with #fossasia
Types	messages	TWITTER	709136139332890625		2016-03-14T08:27:22.212Z	2016-03-13T21:56:45.000Z	foss_asia	http://fossasia.blogspot.com/
FOSSASIA_API	messages	TWITTER	709178508111548417		2016-03-14T08:27:22.205Z	2016-03-14T00:45:06.000Z	fossasia	It's #Monday Morning again but guess what? There's #FOSSASIA to look forward to this
IMPORT	messages	TWITTER	709260211836485632		2016-03-14T08:27:22.204Z	2016-03-14T06:09:46.000Z	philipskokoh	https://twitter.com/fossasia/status/709178508111548417
NETMON	messages	TWITTER	709261212043890688		2016-03-14T08:27:22.203Z	2016-03-14T06:13:45.000Z	EvasiumDev	Kushal das: python track at fossasia 2016 https://kushaldas.in/posts/python-track-at-foss
OPENWIFIMAP	messages	TWITTER	709269794885738496		2016-03-14T08:27:22.200Z	2016-03-14T06:47:51.000Z	Jaysinhp	@kushaldas For FOSSASIA-2016?
TWITTER	messages	USER	707999735118954496		2016-03-13T08:11:24.913Z	2016-03-10T18:41:05.000Z	loklak_app	"http://fossasia.org/ presenting #loklak and representing #YaCy"
USER	messages	USER	708298385736863744		2016-03-12T22:46:28.870Z	2016-03-11T14:27:49.000Z	J_L_M	https://kushaldas.in/posts/python-track-at-fossasia-2016.html?utm_source=twitterfeed&u
default	messages	USER	708345027349467136		2016-03-12T22:46:28.869Z	2016-03-11T17:33:09.000Z	nakatomi231	Listening to systemd talk #fossasia
config	messages	USER	708579636825890816		2016-03-12T22:46:28.864Z	2016-03-12T09:05:24.000Z	sogko	@fossasia hey do you guys have the FOSSASIA 2016 schedule on google calendar or ical?
index-pattern	messages	USER	708612567673872384		2016-03-12T22:46:28.863Z	2016-03-12T11:16:16.000Z	sogko	https://github.com/sogko/fossasia-2016-google-calendar https://pic.twitter.com/NiVqn8lx
FIELDS	messages	USER	708608514592083968		2016-03-12T22:46:28.863Z	2016-03-12T11:00:09.000Z	fossasia	#Opensource Purist OR Pragmatist? For one weekend, converge at #Fossasia 2016
active_status	messages	USER	708633704860684288		2016-03-12T22:46:28.862Z	2016-03-12T12:40:15.000Z	schestowitz	https://kushaldas.in/posts/python-track-at-fossasia-2016.html
appearance_first ?	messages	USER	708633814654791680		2016-03-12T22:46:28.862Z	2016-03-12T12:40:41.000Z	jigyasa_grover	@sogko @fossasia Awesome.
appearance_latest ?	messages	USER	708637202901704705		2016-03-12T22:46:28.862Z	2016-03-12T12:54:09.000Z	hpdang	thanks http://2016.fossasia.org/volunteers https://pic.twitter.com/83CCnYOh50
apps.wall.all.text	messages	USER	708704980669059072		2016-03-12T22:46:28.859Z	2016-03-12T17:23:29.000Z	protocol96	Kushal Das: Python track at FOSSASIA 2016 https://www.protocol96.com/blog/kushal-da
apps.wall.anv.text	messages	USER	708782925664288768		2016-03-12T22:46:28.846Z	2016-03-12T22:33:12.000Z	nakatomi231	Listening to systemd talk #fossasia
apps.wall.blockRetweets	messages	USER	708293616620285953		2016-03-12T22:46:10.320Z	2016-03-11T14:08:52.000Z	PythonDiario	Kushal Das: Python track at FOSSASIA 2016 https://kushaldas.in/posts/python-track-at-fo
apps wall chosen location	messages	USER	708294433847042049		2016-03-12T22:46:10.304Z	2016-03-11T14:12:07.000Z	programmingncr	Kushal Das: Python track at FOSSASIA 201
anns wall cycle	messages	USER	708295868659535872		2016-03-12T22:46:10.301Z	2016-03-11T14:17:49.000Z	foss_asia	http://fossasia.blogspot.com/
apps wall cycleDolayTime	messages	USER	708356590932365313		2016-03-12T22:46:05.992Z	2016-03-11T18:19:06.000Z	PythonBooks	https://kushaldas.in/posts/python-track-at-fossasia-2016.html https://pic.twitter.com/1g
apps.waii.cyclebeidy nine	messages	TWITTER	707403325390520320		2016-03-10T01:15:54.106Z	2016-03-09T03:11:10.000Z	philipskokoh	I will be giving a workshop at #FOSSASIA 2016 titled: Elasticsearch: You know, for search
apps.waii.cyclePostLimit	messages	TWITTER	707451350733422593		2016-03-10T01:15:54.105Z	2016-03-09T06:22:00.000Z	Jay7t	Программа на следующую неделю: http://2016.pgday.asia/index.html#program #FOSS/
apps.waii.eventName								

http://fossasia.blogspot.com/

http://fossasia.blogspot.com/ @fossasia @Jay7t @pleia2 poor woman <img class="Emoji Emoji-forText" src="https://a And we'll need to do this again soon! https://twitter.com/fossasia/status/7075580744001!

@fossasia @pleia2 in your traditional pink i see!

Locations 4 19/03/16 @2pm: #london #marble_arch #paris #berlin #alexanderplatz #sar

2016-03-09T19:42:34.916Z 2016-02-01T09:53:41.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:42:34.916Z 2016-02-01T09:53:40.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:42:34.916Z 2016-02-01T09:53:39.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:42:34.916Z 2016-02-01T09:53:39.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:41:51.078Z 2016-02-01T09:53:40.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:38:22.128Z 2016-02-01T06:05:46.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:38:22.128Z 2016-02-01T06:05:47.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:38:22.128Z 2016-02-01T04:13:36.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:38:22.128Z 2016-02-01T04:13:36.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:38:22.128Z 2016-02-01T04:13:36.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:38:22.128Z 2016-02-01T04:13:36.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:38:22.128Z 2016-02-01T06:05:47.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:38:22.128Z 2016-02-01T04:13:37.000Z PaulSmi81326119 http://fossasia.blogspot.com/ 2016-03-09T19:38:22.125Z 2016-02-01T07:37:49.000Z seoul_victoria @opensrcdesign @jancborchardt Are you coming to @fossasia? would be great to have "O Meetup 4 http://www.meetup.com/FOSSASIA-OpenTech-Startup-Network/events/228435 2016-03-09T19:30:09.835Z 2016-02-01T06:15:00.000Z axelerant

FUSSASTA 2016 Singapore: Big Data

messages

TWITTER 707551664819949568

707572435885776896

707595698473213952

707619194540396544

707629365362892801

707695491249774592

694096269858312193

694096267811561473

694096264758063105

694096262107238400

694096266041495552

694038914240151552

694038917553598464

694010686486106113

694010687639556096

694010685328461824

694010688436461568

694038918405054465

694010689338212353

694062078433165312

694041237792382976

693900139316908032

messages

TWITTER

TWITTER

TWITTER

TWITTER

TWITTER

USER

2016-03-09T18:39:18.082Z 2016-01-31T20:54:19.000Z PaulSmi81326119 http://fossasia.blogspot.com/

2016-03-10T01:15:54.103Z 2016-03-09T13:00:37.000Z foss asia

2016-03-10T01:15:54.100Z 2016-03-09T14:23:09.000Z foss_asia

2016-03-10T01:15:54.094Z 2016-03-09T17:28:57.000Z nixxin

2016-03-10T01:15:54.092Z 2016-03-09T18:09:22.000Z maco nix

2016-03-10T01:15:54.035Z 2016-03-09T22:32:08.000Z freebassel

2016-03-10T01:15:54.096Z 2016-03-09T15:55:35.000Z dyadyaLesha

with Small Messages - Data Indexing and Storage with Loklak (C) 2016-03-19 [CC-by-SA] by Michael Christen, mc@yacy.net; @Urbit3r

Cluster in Elasticsearch HQ

loklak.org



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Cluster in Elasticsearch HQ

loklak.org

Elastic HQ HQ http://host000:9200	Connect	The My Settings	Q Get Help	C Star us on	GitHub	Slog
loklakcluster			Indices	Q Query	Mappings	♦ REST
Real Node Diagnostics Monitor Nodes -						
€ 12:57:18	Cluster Over	view				#

.11	Cluster Statistics					
	8	162	162	6	739,945,807	509.3GB
	Nodes	Total Shards	Successful Shards	Indices	Documents	Size

6	Cluster Health	
Sta	atus	Green
Tir	ned Out?	false
# 1	Nodes	8
#[Data Nodes	8
Ac	tive Primary Shards	81
Ac	tive Shards	162
Re	locating Shards	0
Ini	tializing Shards	0
Un	assigned Shards	0

■ Indices					
Index	# Docs	Primary Size	# Shards	# Replicas	Status
users	50,672,657	19.4GB	16	1	open
queries	3,107	2.0MB	16	1	open
messages	689,269,955	489.9GB	16	1	open
import_profiles	0	2.5KB	16	1	open
accounts	86	4.2MB	16	1	open
.kibana	2	17.6KB	1	1	open



Cluster in Elasticsearch HQ

loklak.org

🚯 Elastic HQ 🛔 h	ttp://host000:9200	Connect				My Settings	Get Help Star us or	n GitHub 📢 Blog
0 loklakelustar							Indices 0 Query	Mappings (A BES
								 Mappings Mappings
Node Diagnostics	Ionitor Nodes -							
C 12:56:24			Node	Diagnostics Ir	nformation			I≣ Select Ø Help
Mouseover each table cell for deta	iled information.							
Summary								
Node Name:	host000_node0	host000_node1	host000_node2	host000_node3	host001_node0	host001_node1	host001_node2	host001_no
IP Address:	119.81.6.246.9300	119.81.6.246.9301	119.81.6.246.9302	119.81.6.246.9303	119.81.6.243.9300	119.81.6.243:9301	119.81.6.243:9302	119.81.6.243:8
FS Untime:	gymvE94vHCSH5OILLD7iyg	0.09 days	0.09 days	nueuwnosjąwonaw-kiug	0.10 days	0 10 days	0.10 days	0.10 d
II File System	0.00 days	0.05 days	0.00 days	0.05 days	0.10 days	0.10 days	0.10 days	0.100
Store Size:	189.9GB	157.1GB	68.2GB	94.3GB	125.8GB	35.7GB	189.8GB	158.0
# Documents:	274,324,090	224,847,855	105,147,381	135,588,726	181,754,722	55,768,979	274,304,764	228,079,
Documents Deleted:	2.4%	2.3%	5.4%	2.4%	1.9%	8.4%	2.4%	2.
Merge Size:	6.3GB	4.4GB	3.0GB	2.4GB	3.6GB	1.8GB	5.5GB	4.4
Merge Time:	01:34:25	00:14:21	00:06:03	00:03:48	00:11:05	00:02:31	00:16:58	00:1
Merge Rate:	1.2 MB/s	5.5 MB/s	9 MB/s	11.2 MB/s	5.8 MB/s	12.8 MB/s	5.8 MB/s	6.9 N
File Descriptors:	1,033	772	751	663	806	677	916	
Disk space used:	23.3%	17.2%	7.5%	10.4%	22.4%	4%	20.8%	17
Disk space free:	702.0GB	758.6GB	847.8GB	821.8GB	710.1GB	880.6GB	725.6GB	757.7
Index Activity								
Indexing - Index:	18.88ms	3.8ms	1.31ms	1.26ms	2.7ms	0.67ms	3.71ms	2.1
Indexing - Delete:	Oms	Oms	Oms	Oms	Oms	Oms	Oms	
Search - Query:	7334.85ms	1626.64ms	353.39ms	542.45ms	1179.8ms	136.85ms	1524.16ms	1116.2
Search - Fetch:	791.07ms	178.8ms	35.15ms	55.99ms	202.51ms	13.02ms	170.36ms	115.8
Get - Total:	77.66ms	21.09ms	17.46ms	11.86ms	18.79ms	11.61ms	21.13ms	15.03
Get - Exists:	144.98ms	46.63ms	22.51ms	25.48ms	37.65ms	13.08ms	40.19ms	30.21
Get - Missing:	37.29ms	9.51ms	8.74ms	5.11ms	7.59ms	7.8ms	10.37ms	6.5
Refresh:	577.39ms	251.66ms	119.31ms	80.22ms	209.26ms	69.71ms	225.73ms	172.6
Flush:	3400.85ms	355.07ms	264.06ms	135.67ms	672.77ms	207.88ms	727.54ms	58
Cache Activity				0.0				
Field Size:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Filter Cache Size:	0	0	00	0	0	00	0	
Filter Evictions:	0.0er query	0 per query	D per query	0 per query	0 per query	0.er query	0 per query	0 per q
ID Cache Size:	o por query	o per query	o por query	o per query	o per query	o per query	o por query	o por q
% ID Cache:	0%	0%	0%	0%	0%	0%	0%	
Memory								
Total Memory:	0 gb	0 gb	0 gb	0 gb	0 gb	0 gb	0 gb	(
Heap Size:	1.5 gb	1.5 gb	1.5 gb	1.5 gb	1.5 gb	1.5 gb	1.5 gb	1.5
Heap % of RAM:	0%	0%	0%	0%	0%	0%	0%	
% Heap Used:	94.4%	67.3%	70.2%	65%	64.2%	71.3%	82.5%	63
GC MarkSweep Frequency:	0 s	0 s	0 s	0 s	0 s	0 s	0 s	
GC MarkSweep Duration:	Oms	Oms	Oms	Oms	Oms	Oms	Oms	
GC ParNew Frequency:	0 s	0 s	0 s	0 s	0 s	0 s	0 s	
GC ParNew Duration:	Oms	Oms	Oms	Oms	Oms	Oms	Oms	
G1 GC Young Generation Freq:	0 s	0 s	0 s	0 s	0 s	0 s	0 s	
G1 GC Young Generation Dura	tion: Oms	Oms	Oms	Oms	Oms	Oms	Oms	
G1 GC Old Generation Freq:	0 s	0 s	0 s	0 s	0 s	0 s	0 s	
G1 GC Old Generation Duration	n: Oms	Oms	Oms	Oms	Oms	Oms	Oms	
Swap Space:	160.6953 MB	160.6953 MB	160.6953 MB	160.6953 MB	172.7148 MB	172.7148 MB	172.7148 MB	172.7148
Network								
HTTP Connection Rate:	1 /second	0 /second	0 /second	0 /second	0 /second	0 /second	0 /second	0 /seco



Kibana Data Evaluation

loklak.org



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API external Application: Tweet Retriever

loklak.org

https://github.com/Yathannsh/tweetRetriver

Yathannsh / tweetRetriver	Watch	1 ★ Unstar 1 % Fork 0						
<> Code () Issues () Pull requ	_ Graphs							
A Loklak based tweet retriever http://gci.yathannsh.com/tweetr								
6 commits	p 1 branch	⊙ 0 releases	1 contributor					
Branch: master - New pull request	New file Upload files Find file	HTTPS - https://github.com/Ya	than 😥 🛃 Download ZIP					
1 Yathannsh Merge remote-tracking brand	ch 'origin/master'		Latest commit ed62e7d on 15 Jan					
CSS	Fixed search icon & overlapping		2 months ago					
README.md		2 months ago						
index.html	Fixed search icon & overlapping							
☐ licence.md	Create licence.md		2 months ago					

E README.md

Starwars Tweet Retriver

A Loklak based tweet retriever, which retrives tweets related to the movie - Starwars

Working

- This single page application displays the most recent 100 tweets related to Starwars
- It makes use of the Loklak API
- It's build on Ajax





API external Application: AI Chatbot

loklak.org

	Michael /start	V 9.12.15
	loklak.org bot Michael Christen /start	9.12.15
	loklak.org bot - simple Telegram bot for searching tweets. Just send a message with your query and bot will process it, using loklag.org API. If you want to contribute, project is open source: https://github.com/sevazhidkov/tweets- search-bot	
	loklak: Distributed Tweet Search Server Twitter Scraper	
	Michael What is love	9 .12.15
	loklak.org bot Michael Christen What is love	9.12.15
	"Is this what love looks like? http://loklak.org/x?id=674649768073650177" - MTVteenwolf	
	https://twitter.com/MTVteenwolf/status/674649768073650177	
	99 more tweets. /next_tweet	
	Twimg Twitter Video	
	Michael	9 ,12,15
С	Xwing	
	loklak.org bot	9.12.15
	Michael Christen Xwing	
	"X-Wing: A Simple Star Wars Flying Game on WebGL - http://oos.moxiecode.com/js_webgl/ xwing/ https://pic.twitter.com/V9s0m3v77H" - HTML5Weekly	
	https://twitter.com/HTML5Weekly/status/672150283389136896	
	99 more tweets. /next_tweet	
С	Michael	V 9.12.15
	/next_tweet	
	loklak.org bot	9.12.15
	Michael Christen /next_tweet	



FOSSASIA 2016 Singapore: Big Data

risten, mc@yacy.net; @0rb1t3r



API external Application: Android Search App loklak.org





API external Application: Android Harvest App loklak.org



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API external Application: loklak.net

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loklak.org

API external Application: loklak.net

loklak.org

loklak.org

#loklak can create tweets with very large attachment texts using #markdown, attached as image test.loklak.net

THIS IS A TEST-TEXT FOR LARGE ATTACHMENT TEXTS.

THE LARGEST HEADING (AN (H1) TAG) THE SECOND LARGEST HEADING (AN (H2) TAG)

THE 6TH LARGEST HEADING (AN (H6) TAG)

IN THE WORDS OF ABRAHAM LINCOLN:

> PARDON MY FRENCH

THIS TEXT WILL BE ITALIC THIS TEXT WILL BE BOLD

ITEM ITEM ITEM

1. ITEM 1 2. ITEM 2 3. ITEM 3

HERE'S AN IDEA: WHY DON'T WE TAKE SUPERIORPROJECT AND TURN IT INTO REASONABLEPROJECT.

CHECK OUT THIS NEAT PROGRAM I WROTE:

X = 0 X = 2 + 2 WHAT IS X

IF YOU LIKE THIS, CHECK THE LOKLAK PROJECT AT HTTP://LOKLAK.ORG (FOR THE SERVER) AND HTTP://LOKLAK.NET (FOR THE WEBCLIENT)

TO GET LATEST NEWS, CHECK @@RB1T3R

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FOSSASIA 2016 Singapore Big Data with Small Messages Data Indexing and Storage with loklak

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