OBRADA LOGOVA WEB SERVERA

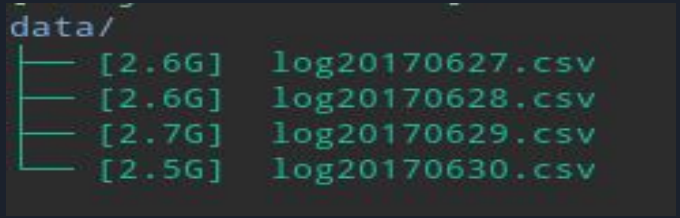
Danijel Radaković, R1 20/2019

DATA SET

- **EDGAR Log File Data Set** - sadrži informacije o pretragama koje su izvršene pomoću *SEC.gov* web sajta u periodu od 14.02.2013. do 30.06.2017. godine
- *SEC - Securities And Exchange Commission*
- Veličina *Data Set*-a je otprilike 13 TB, od čega je 10 GB obrađivano u projektu
- Data Set se sastoji od **csv** fajlova u kojem se nalaze *access* logovi **Apache Web Server**-a u anonimizovanom formatu

DATA SET

- Obrada se vrši nad logovima nastali u periodu od 26.06.2017. do 30.06.2017.
- Format loga je opisan ovde



DATA SET - FORMAT LOGA

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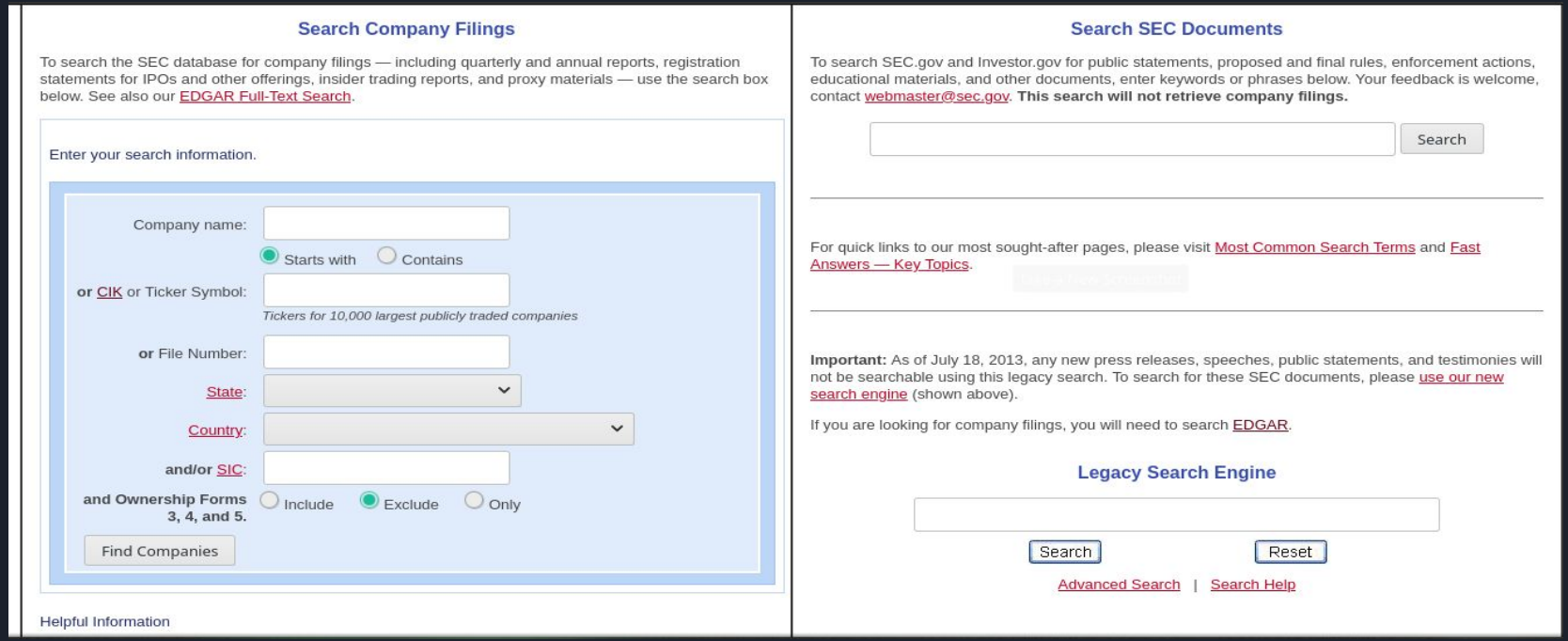
PRIMER PRETRAGE

- https://www.sec.gov/search/search.htm



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or CIK or Ticker Symbol:
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State:
Country:
and/or SIC:
and Ownership Forms 3, 4, and 5. Include Exclude Only
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If you are looking for company filings, you will need to search EDGAR.

Legacy Search Engine

Search Reset

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PRIMER PRETRAGE - UNOS CIK

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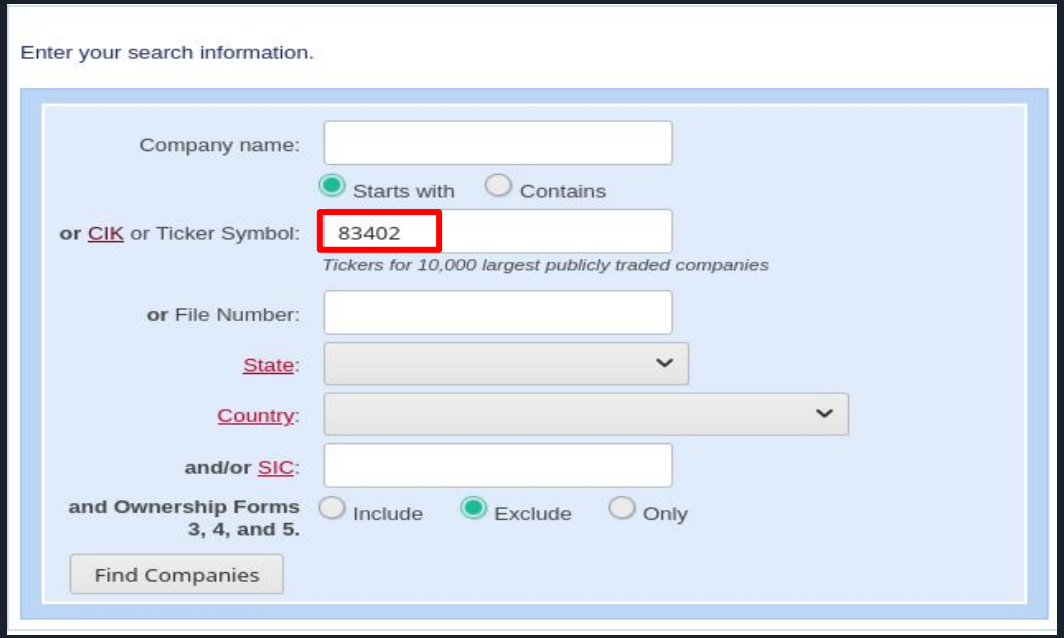

PRIMER PRETRAGE - REZULTAT PRETRAGE

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8-K	Documents		Current report, items 5.07, 8.01, and 9.01 Acc-no: 0001193125-16-695325 (34 Act) Size: 34 KB	2016-08-29
8-K	Documents		Current report, item 8.01 Acc-no: 0001193125-16-680079 (34 Act) Size: 52 KB	2016-08-12
DEFA14A	Documents		Additional definitive proxy soliciting materials and Rule 14(a)(12) material Acc-no: 0001193125-16-680080 (34 Act) Size: 52 KB	2016-08-12
10-Q	Documents	Interactive Da	Quarterly report [Sections 13 or 15(d)] Acc-no: 0000083402-16-000062 (34 Act) Size: 13 MB	2016-08-08
8-K	Documents		Current report, item 2.02 Acc-no: 0000083402-16-000059 (34 Act) Size: 269 KB	2016-08-03
DEFM14A	Documents		Definitive proxy statement relating to merger or acquisition Acc-no: 0001193125-16-648410 (34 Act) Size: 1 MB	2016-07-14
11-K	Documents		Annual report of employee stock purchase, savings and similar plans Acc-no: 0000083402-16-000055 (34 Act) Size: 298 KB	2016-06-28
PREM14A	Documents		Preliminary proxy statements relating to merger or acquisition Acc-no: 0001193125-16-623074 (34 Act) Size: 1 MB	2016-06-16

PRIMER PRETRAGE

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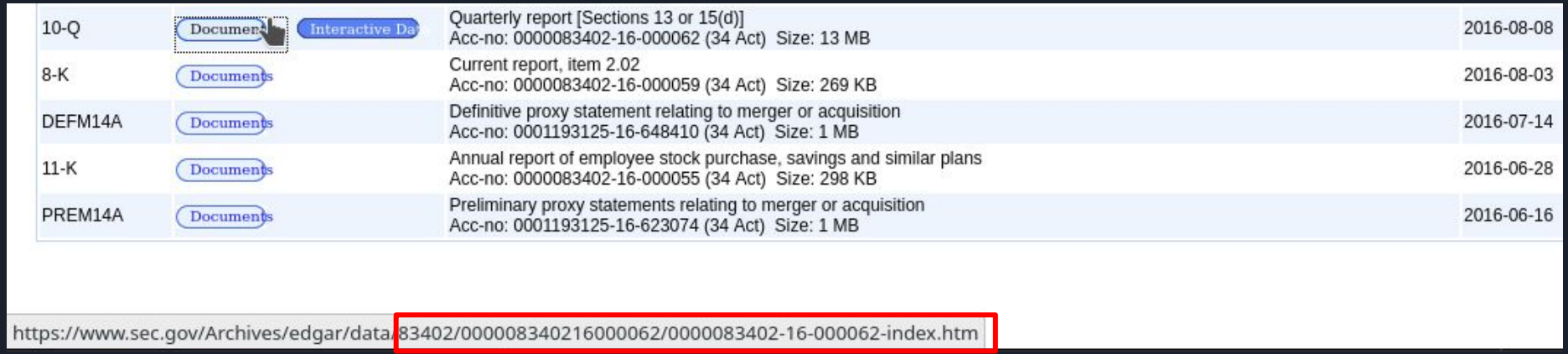

10-Q	Documents Interactive Da	Quarterly report [Sections 13 or 15(d)] Acc-no: 0000083402-16-000062 (34 Act) Size: 13 MB	2016-08-08
8-K	Documents	Current report, item 2.02 Acc-no: 0000083402-16-000059 (34 Act) Size: 269 KB	2016-08-03
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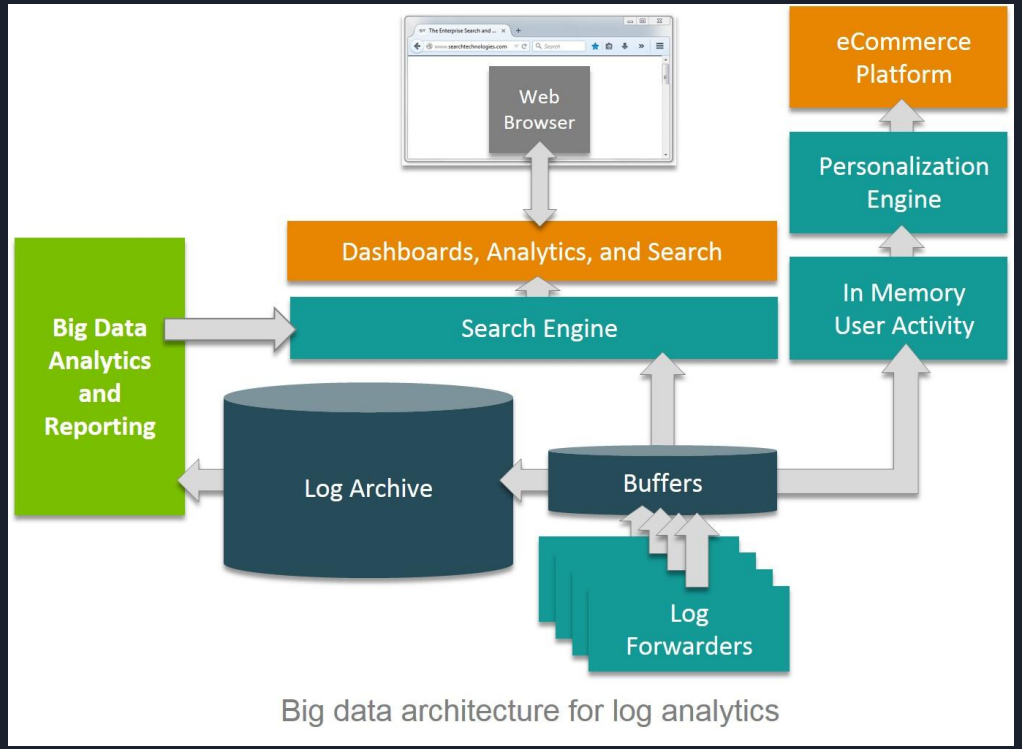
PREM14A	Documents	Preliminary proxy statements relating to merger or acquisition Acc-no: 0001193125-16-623074 (34 Act) Size: 1 MB	2016-06-16

ARHITEKTURA SISTEMA

Enterprise rešenja koriste sledeći stack tehnologija:

- Elasticsearch - brza pretraga logova
- Logstash - parsiranje i skladištenje logova
- Kibana - vizualizacija u browser-u

ARHITEKTURA SISTEMA

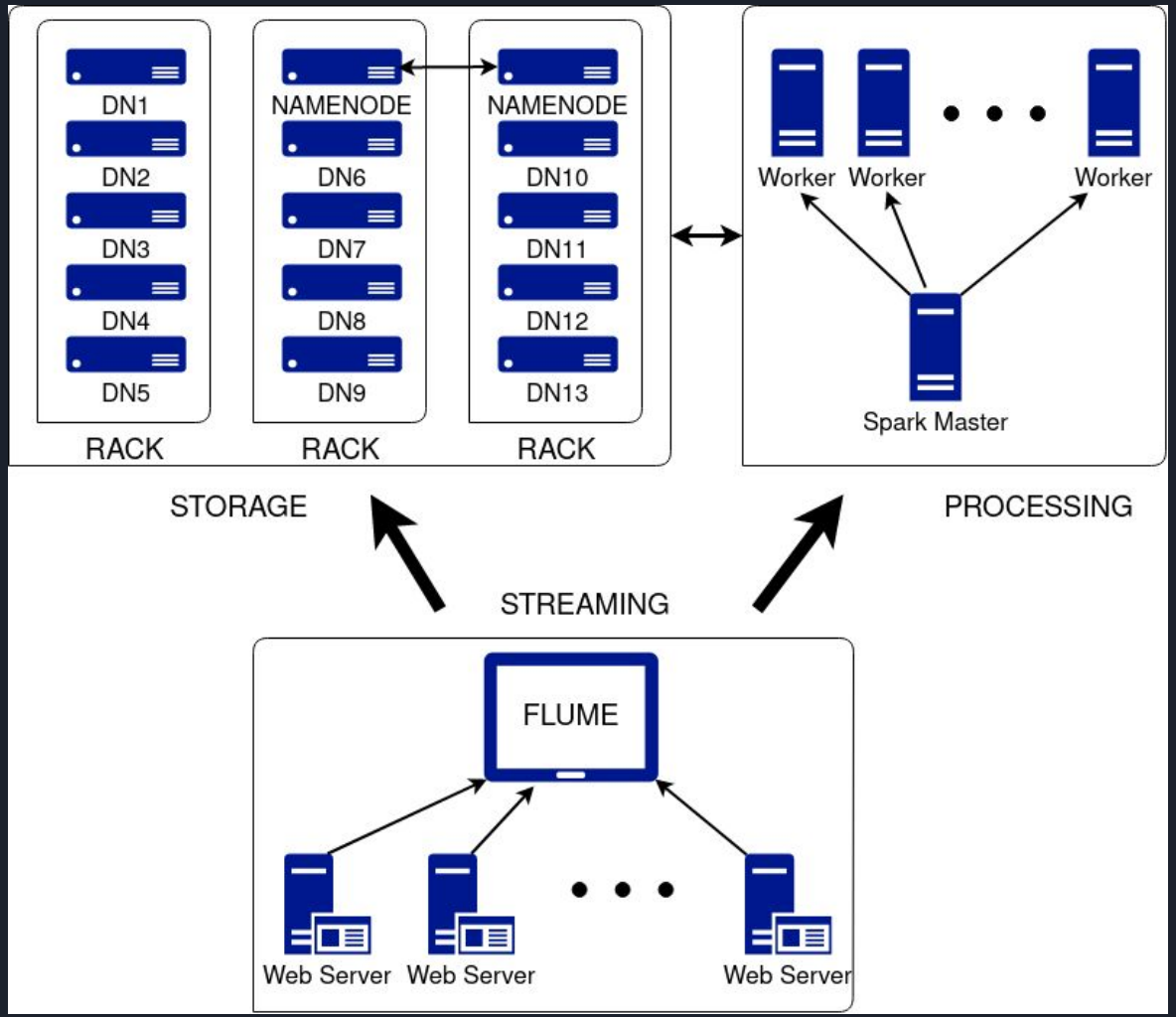


Big data architecture for log analytics

ARHITETKTURA SISTEMA

Open source alternative:

- skladištenje i obrada logova: Apache Flume, Apache Spark, Search Technologies' Aspire
- pretraga logova: Solr, Lucidworks
- vizualizacija: Apache Hue, Pentaho Analytics and Data Integration, HighCharts, D3 Charts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DN9
RACK
NAMENODE
DN10
DN11
DN12
DN13
RACK
Worker
Worker
Worker
Spark Master
STORAGE
PROCESSING
STREAMING
FLUME
Web Server
Web Server
Web Server

BATCH OBRADA - PREDPROCESIRANJE - SIROVI PODACI

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107.23.85.jfd	2017-06-29	00:00:00	0.0	1353349.0	0001056404-06-003388	-index.htm	200.0	2666.0	1.0	0.0	0.0	10.0	0.0	null
107.23.85.jfd	2017-06-29	00:00:00	0.0	1305479.0	0000905148-07-000003	-index.htm	200.0	2940.0	1.0	0.0	0.0	10.0	0.0	null
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107.23.85.jfd	2017-06-29	00:00:00	0.0	1353349.0	0001056404-06-004082	-index.htm	200.0	2668.0	1.0	0.0	0.0	10.0	0.0	null
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BATCH OBRADA - PREDPROCESIRANJE - TRANSFORMISANI PODACI

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107.23.85.jfd	1353349.0	0001056404-06-002937	-index.htm	200	2665	1	0	0	10	0	2017-06-29 00:00:00
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BATCH OBRADA

- *Batch* obrda je implementirana nešto nalik *Command* softverskog obrasca.
- Komanda treba da procesira podatke na određeni način i da izgeneriše izveštaj.
- Ovakav dizajn omogućava fleksibilan i lagan način za dodovanje novih komadni koji će generisati izveštaje.

BATCH OBRADA

- Generisanje opšteg izveštaja koji sadrži:
  - ukupan broj zahteva
  - broj uspešnih zahteva
  - broj neuspešnih zahteva
  - broj jedinstvenih posetilaca (ista IP adresa i *timestamp* zahteva, kada bi postojale informacije o *web browser*-u uključili bismo i to)
  - broj neuspešnih zahteva sa statusom 404
  - broj zahteva koji sadrže Referrer polje
  - ukupan protok saobraćaja izražen u GB

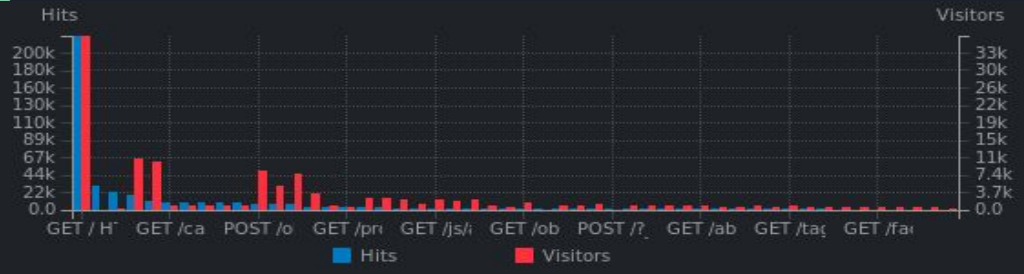
BATCH OBRADA

#	Hits	Visitors	Tx. Amount	Avg. T.S.	Data
	1,351,664 Max: 5,740 Min: 163	278,357 Max: 813 Min: 48	45.35 GiB Max: 864.88 MiB Min: 1.15 MiB	519.89 ms	2,002 Total
1	292 (0.02%)	65 (0.02%)	2.99 MiB (0.01%)	145.26 ms	17/Nov/2019:16
2	641 (0.05%)	143 (0.05%)	8.89 MiB (0.02%)	224.27 ms	17/Nov/2019:15
3	628 (0.05%)	143 (0.05%)	4.92 MiB (0.01%)	216.91 ms	17/Nov/2019:14
4	547 (0.04%)	152 (0.05%)	4.64 MiB (0.01%)	251.42 ms	17/Nov/2019:13
5	723 (0.05%)	138 (0.05%)	6.41 MiB (0.01%)	164.09 ms	17/Nov/2019:12
6	806 (0.06%)	129 (0.05%)	7.8 MiB (0.02%)	155.73 ms	17/Nov/2019:11
7	677 (0.05%)	129 (0.05%)	8.18 MiB (0.02%)	183.47 ms	17/Nov/2019:10

Izveštaj obuhvata:

- broj posetilaca, uključujući web crawler-e, (**Visitors**) i zahteva (**Hits**) koji su se desili u roku od sat vremena
- ukupan protok saobraćaja (**Tx. Amount**) kao i prosečno vreme izvršavanja zahteva (**Avg T.S.**) grupisani na nivou sata

BATCH OBRADA

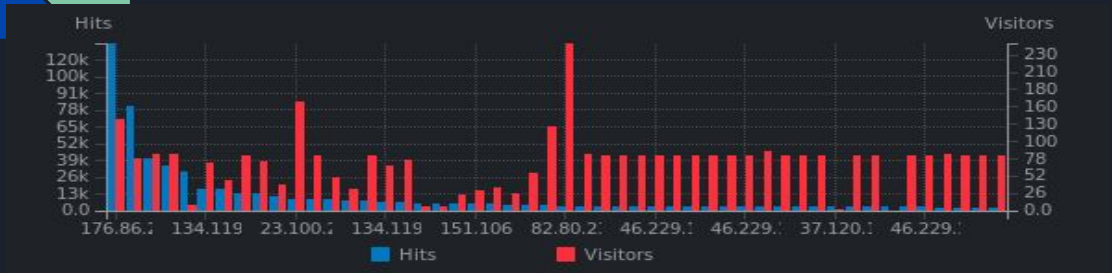


#	Hits	Visitors	Tx. Amount	Avg. T.S.	Data
	874,044 Max: 222,199 Min: 1	510,884 Max: 37,176 Min: 1	3.18 GiB Max: 680.95 MiB Min: 0 Byte	252.04 ms	141,174 Total
1	222,199 (25.42%)	37,176 (7.28%)	680.95 MiB (20.89%)	9.84 ms	/
2	30,892 (3.53%)	8 (0.00%)	3.24 MiB (0.10%)	0.00 us	bind.sh firewall-falcon quetz
3	22,499 (2.57%)	402 (0.08%)	7.66 MiB (0.24%)	1.31 ms	/
4	19,904 (2.28%)	11,000 (2.15%)	63.3 MiB (1.94%)	48.23 ms	/obituaries
5	11,752 (1.34%)	10,266 (2.01%)	148.58 MiB (4.56%)	85.17 ms	/obituaries/439/elaine-k-bra
6	9,120 (1.04%)	919 (0.18%)	55.74 MiB (1.71%)	13.55 ms	/cart
7	9,025 (1.03%)	895 (0.18%)	56.73 MiB (1.74%)	19.19 ms	/products/gerberas

Izveštaj obuhvata:

- broj posetilaca (**Visitors**) i zahteva (**Hits**) grupisani po *SEC Central Index Key* polju
- ukupan protok saobraćaja (**Tx. Amount**) kao i prosečno vreme izvršavanja zahteva (**Avg T.S.**) grupisani *SEC Central Index Key* polju

BATCH OBRADA



#	Hits	Visitors	Tx. Amount	Avg. T.S.	Data
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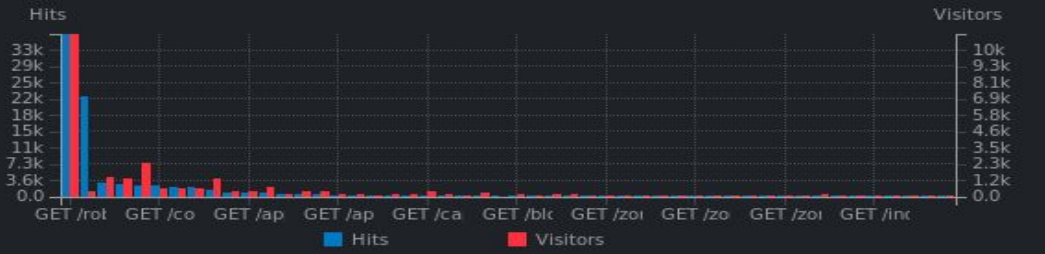
1	130,526 (9.65%)	137 (0.08%)	491.61 MiB (1.06%)	1.33 s	176.86.241.109
2	81,966 (6.06%)	78 (0.05%)	222.13 MiB (0.48%)	7.05 ms	69.162.124.233
3	41,294 (3.05%)	85 (0.05%)	153.48 MiB (0.33%)	9.32 ms	134.119.218.243
4	35,011 (2.59%)	86 (0.05%)	136.28 MiB (0.29%)	9.32 ms	134.119.216.167
5	30,905 (2.29%)	8 (0.00%)	3.24 MiB (0.01%)	0.00 us	::1
6	16,753 (1.24%)	72 (0.04%)	61.73 MiB (0.13%)	9.16 ms	134.119.219.93
7	16,586 (1.23%)	45 (0.03%)	62.53 MiB (0.13%)	9.40 ms	134.119.193.63

Izveštaj obuhvata:

- broj posetilaca (**Visitors**) i zahteva (**Hits**) grupisani po IP adresama
- ukupan protok saobraćaja (**Tx. Amount**) kao i prosečno vreme izvršavanja zahteva (**Avg T.S.**) grupisani po IP adresama

BATCH OBRADA



#	Hits	Visitors	Tx. Amount	Avg. T.S.	Data
	135,727 Max: 36,269 Min: 1	66,582 Max: 11,570 Min: 1	448.19 MiB Max: 83.99 MiB Min: 158 B	13.97 ms	8,984 Total
1	36,269 (26.72%)	11,570 (17.38%)	83.99 MiB (18.74%)	3.69 ms	/robots.txt
2	22,414 (16.51%)	430 (0.65%)	80.41 MiB (17.94%)	10.59 ms	/
3	3,254 (2.40%)	1,431 (2.15%)	3.58 MiB (0.80%)	1.62 ms	/apple-touch-icon.png
4	2,889 (2.13%)	1,293 (1.94%)	3 MiB (0.67%)	1.60 ms	/apple-touch-icon-precompose
5	2,443 (1.80%)	2,441 (3.67%)	25.75 MiB (5.74%)	10.75 ms	/blog/10/aloe-vera
6	2,395 (1.76%)	643 (0.97%)	13.84 MiB (3.09%)	10.53 ms	/contactenos
7	2,357 (1.74%)	617 (0.93%)	13.72 MiB (3.06%)	11.00 ms	/login:procesar

Izveštaj obuhvata:

- broj posetilaca,, (**Visitors**) i zahteva (**Hits**) grupisani koji su dobili 404 status
- ukupan protok saobraćaja (**Tx. Amount**)
  kao i prosečno vreme izvršavanja zahteva (**Avg T.S.**) koji imaju status 404

BATCH OBRADA

#	Hits	Visitors	Tx. Amount	Avg. T.S.	Data
	1,352,466 Max: 872,670 Min: 8	222,485 Max: 127,674 Min: 8	45.37 GiB Max: 32.74 GiB Min: 0 Byte	519.69 ms	13 Total
1	917,866 (67.87%)	138,151 (62.09%)	44.7 GiB (98.52%)	761.01 ms	2xx Success
2	278,763 (20.61%)	48,088 (21.61%)	195.45 MiB (0.42%)	3.32 ms	3xx Redirection
3	138,770 (10.26%)	32,132 (14.44%)	450.61 MiB (0.97%)	13.70 ms	4xx Client Errors
4	17,067 (1.26%)	4,114 (1.85%)	39.84 MiB (0.09%)	89.61 ms	5xx Server Errors

Izveštaj obuhvata:

- broj posetilaca,, (**Visitors**) i zahteva (**Hits**) grupisani po statusu
- ukupan protok saobraćaja (**Tx. Amount**) kao i prosečno vreme izvršavanja zahteva (**Avg T.S.**) grupisani po statusu

STREAM OBRADA

- *Stream* obrada radi analizu prispelih logova u realnom vremenu.
- Analiza logova se vrši pomoću pravila koja se mogu lako i fleksibilno dodavati po potrebi.
- Određena pravila se okidaju u pojedinim situacijama i kreiraju alarm sa porukom o uzroku nastanka
- Primer:
  - Pravilo koje detektuje *DoS* napad
  - Pravilo koje detektuje *Brute-force* napad

STREAM OBRADA

- Pojedina pravila nemaju uslov za njihovo okidanje i takva previla predstavljaju izveštaje koji se generišu u realnom vremenu.
- Izvešteji su identični kao u *batch* obradi.