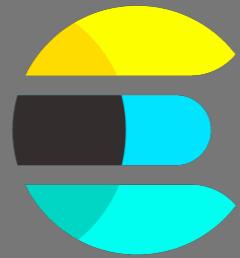


# TAKE CONTROL

## OF LOGGING AND ERROR HANDLING



elasticsearch



STACHEBOX

# Me: Jon Clausen

Senior Software Developer,  
Ortus Solutions

Grand Rapids, Michigan  
USA



**BUGS HAPPEN!**



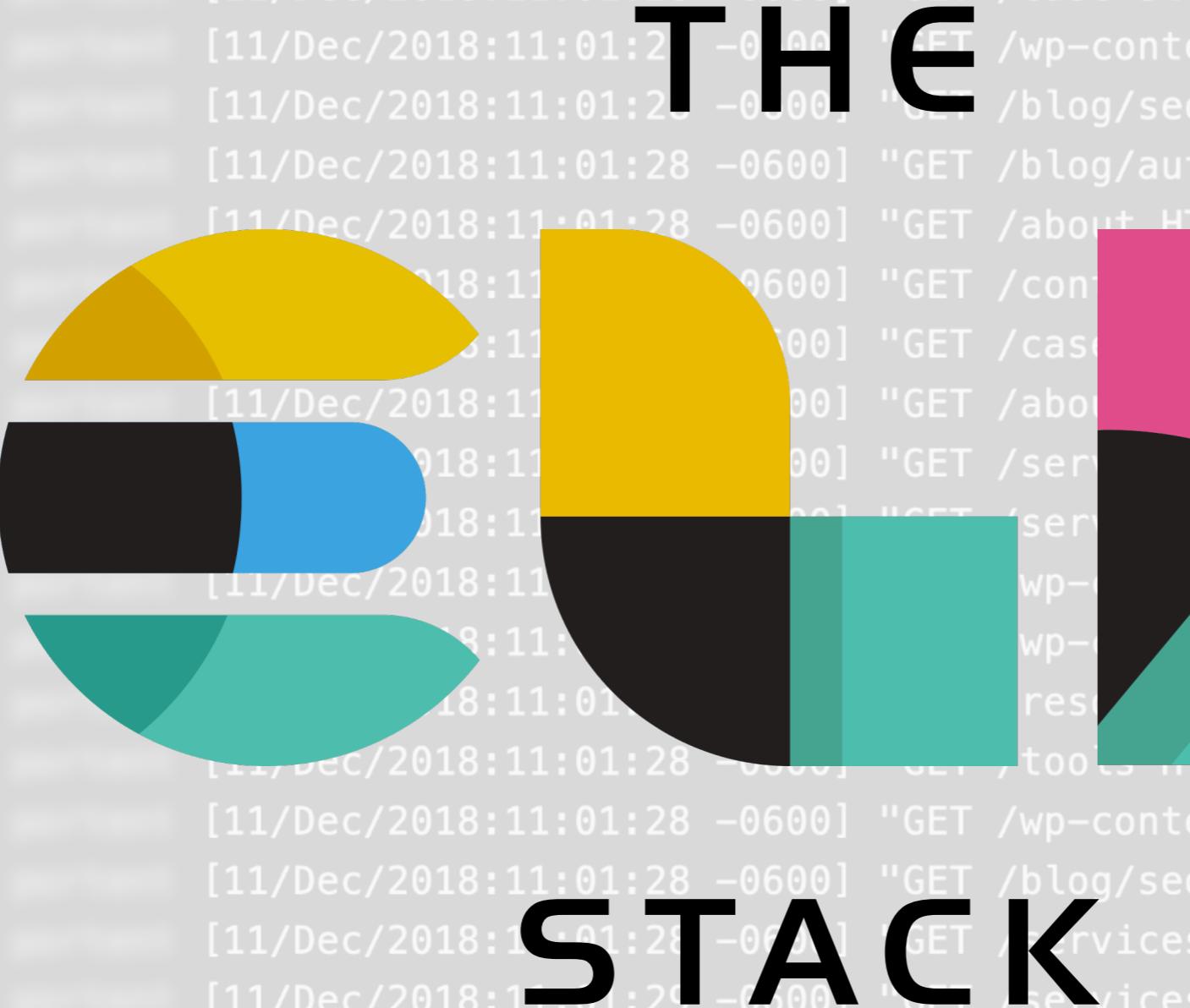
- No matter how good the developers or how thorough the test team, unexpected bugs will occur in deployment
- A single error in a heavy-load application can produce thousands of duplicate log entries
- Modern applications rely heavily on javascript for rendering and UX. This presents additional challenges in catching and handling errors

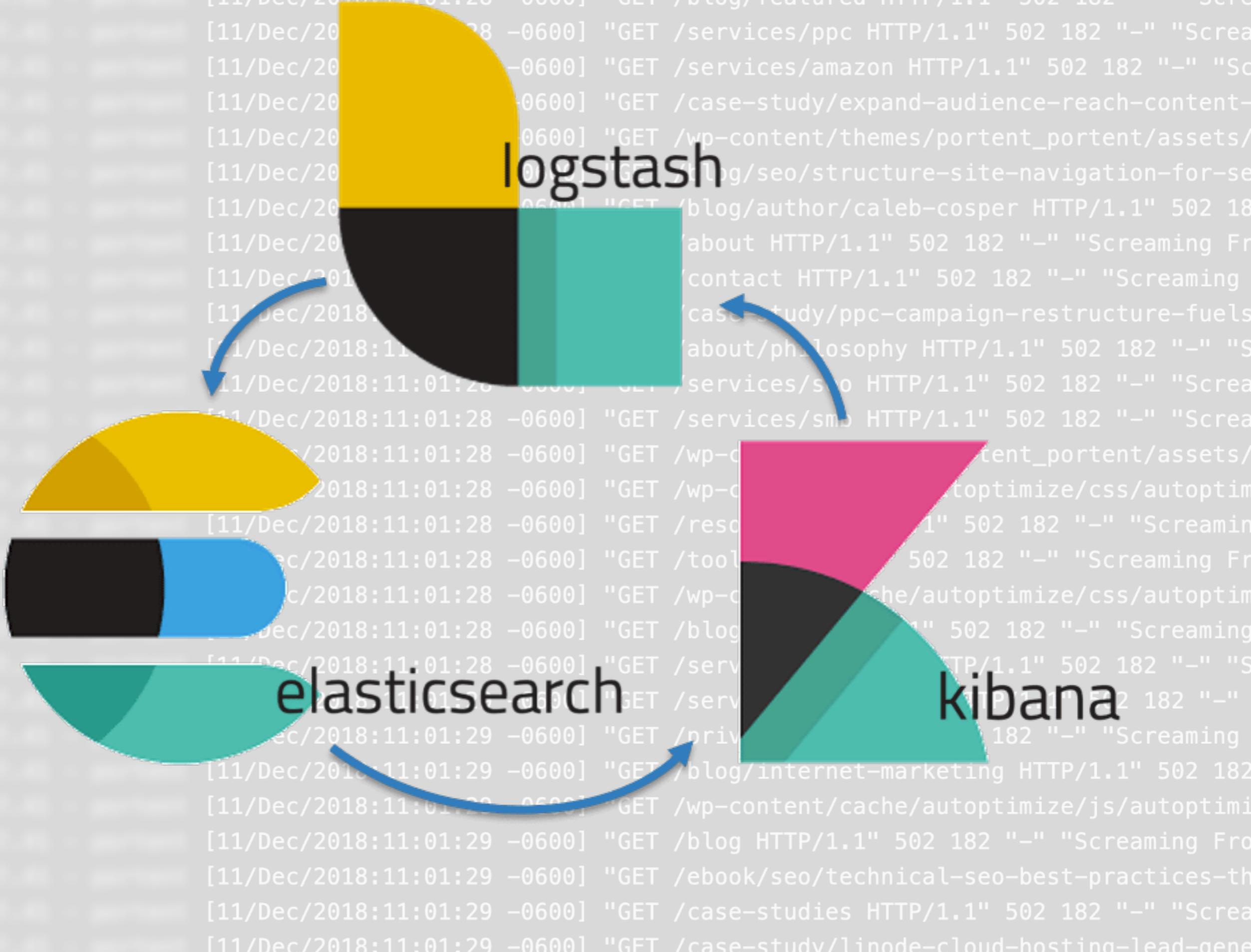


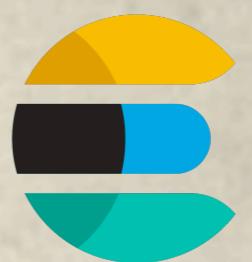
- The inability to track and organize various errors and sources leads to user disappoints and lowers perception of developer competency
- Modern IT infrastructure can make obtaining information on a single log message or error extremely complex



[11/Dec/2018:11:01:28 -0600] "GET /about/careers HTTP/1.1" 502 182 "Scre  
[11/Dec/2018:11:01:28 -0600] "GET /blog/internet-marketing/the\_internet\_mark  
[11/Dec/2018:11:01:28 -0600] "GET /blog/featured HTTP/1.1" 502 182 "-" "Scre  
[11/Dec/2018:11:01:28 -0600] "GET /services/ppc HTTP/1.1" 502 182 "-" "Scre  
[11/Dec/2018:11:01:28 -0600] "GET /services/amazon HTTP/1.1" 502 182 "-" "Scre  
[11/Dec/2018:11:01:28 -0600] "GET /case-study/expand-audience-reach-content-  
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/portent\_portent/assets/  
[11/Dec/2018:11:01:28 -0600] "GET /blog/seo/structure-site-navigation-for-se  
[11/Dec/2018:11:01:28 -0600] "GET /blog/author/caleb-cosper HTTP/1.1" 502 18  
[11/Dec/2018:11:01:28 -0600] "GET /about HTTP/1.1" 502 182 "-" "Screaming Fr  
[11/Dec/2018:11:01:28 -0600] "GET /content HTTP/1.1" 502 182 "-" "Screaming Fr  
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[11/Dec/2018:11:01:28 -0600] "GET /wp-content/cache/autoptimize/css/autoptim  
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[11/Dec/2018:11:01:29 -0600] "GET /case-studies HTTP/1.1" 502 182 "-" "Scre  
[11/Dec/2018:11:01:29 -0600] "GET /case-study/linode-cloud-hosting-lead-gene







elasticsearch

# WHAT IS ELASTICSEARCH?

- Open-source, RESTful, distributed search and analytics engine built on Apache Lucene
- Quickly evolved become the most popular web application search engine
- Used for log analytics, full-text search, and operational intelligence



# WHAT IS ELASTICSEARCH?

- Free, open source software which can be run on-premises or using a variety of cloud-based providers
- Interacts with applications through a REST API, using a JSON-based query DSL



# ELASTICSEARCH BENEFITS

- Fast - 10s on SQL vs 10ms on Elasticsearch
- Intuitive APIs
- Fast Index Updating
- Schema-free JSON document storage
- Performative on very large datasets





# logstash

```
[11/Dec/2018:11:01:28 -0600] "GET /about/careers HTTP/1.1" 502 182 "Scre
[11/Dec/2018:11:01:28 -0600] "GET /blog/internet-marketing/the_internet_mark
[11/Dec/2018:11:01:28 -0600] "GET /blog/featured HTTP/1.1" 502 182 "-" "Scre
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[11/Dec/2018:11:01:28 -0600] "GET /blog/seo/structure-site-navigation-for-se
[11/Dec/2018:11:01:28 -0600] "GET /blog/author/caleb-cosper HTTP/1.1" 502 18
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[11/Dec/2018:11:01:28 -0600] "GET /services/geo HTTP/1.1" 502 182 "-" "Screa
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[11/Dec/2018:11:01:29 -0600] "GET /services/analytics HTTP/1.1" 502 182 "-"
[11/Dec/2018:11:01:29 -0600] "GET /privacy HTTP/1.1" 502 182 "-" "Screaming
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[11/Dec/2018:11:01:29 -0600] "GET /case-studies HTTP/1.1" 502 182 "-" "Screa
[11/Dec/2018:11:01:29 -0600] "GET /case-study/linode-cloud-hosting-lead-gene
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beats



beats



beats

```
[11/Dec/2018:11:01:28 -0600] "GET /about/careers HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /blog/internet-marketing/the_internet_marketing HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /blog/featured HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /services/ppc HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /services/amazon HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /case-study/expanding_your_marketing_reach HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/potent/assets/images/logo.png HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
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[11/Dec/2018:11:01:28 -0600] "GET /blog/author/caleb-ckibana HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /about HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /contact HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/potent/assets/images/icon-social-media.png HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /services/seo HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
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[11/Dec/2018:11:01:28 -0600] "GET /tools HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/cache/autoptimize/css/autoptimize.css HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
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[11/Dec/2018:11:01:28 -0600] "GET /services/content HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:29 -0600] "GET /services/analytics HTTP/1.1" 502 182 "-"
[11/Dec/2018:11:01:29 -0600] "GET /privacy HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
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[11/Dec/2018:11:01:29 -0600] "GET /wp-content/cache/autoptimize/js/autoptimize.js HTTP/1.1" 502 182 "-"
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[11/Dec/2018:11:01:29 -0600] "GET /ebook/seo/technical-seo-best-practices-things-you-can-do-to-improve-your-website SEO Bot/1.1"
[11/Dec/2018:11:01:29 -0600] "GET /case-studies HTTP/1.1" 502 182 "-" "Screaming Frog SpiderBot/1.1"
[11/Dec/2018:11:01:29 -0600] "GET /case-study/linode-cloud-hosting-lead-generation HTTP/1.1" 502 182 "-"/>
```

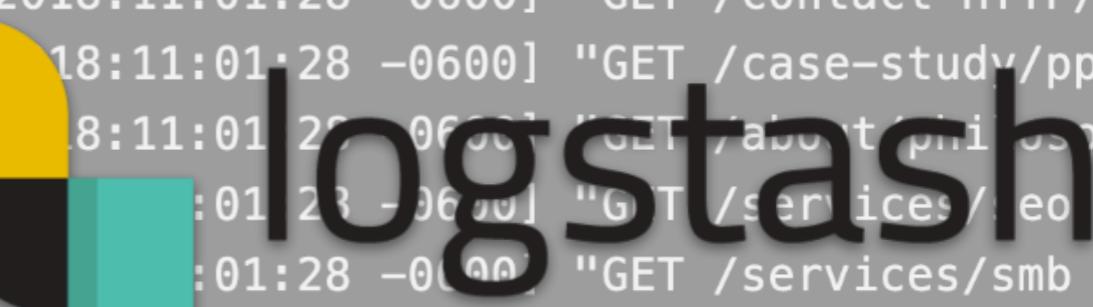
Visualize

Parse, filter  
and transform



# WHAT IS LOGSTASH?

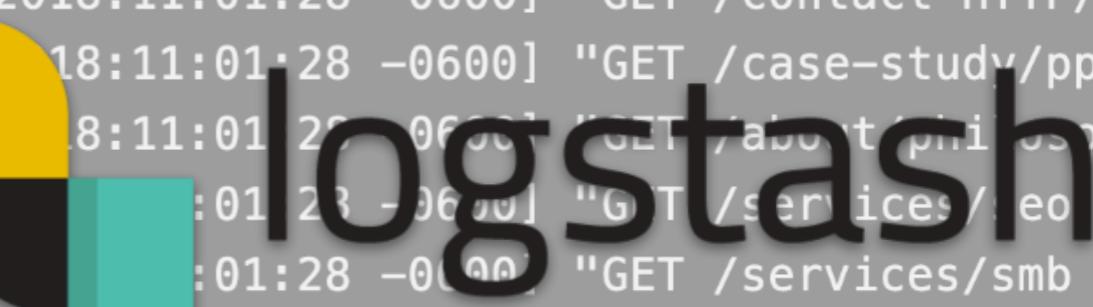
- Logstash is log parsing and formatting middleware for Elasticsearch
- Runs as a binary which can parse and transform many different log types and formats



```
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/
[11/Dec/2018:11:01:28 -0600] "GET /about/careers HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /blog/internet-mark
[11/Dec/2018:11:01:28 -0600] "GET /blog/featured HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /services/ppc HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /services/amazon HTT
[11/Dec/2018:11:01:28 -0600] "GET /case-study/expand-
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/
[11/Dec/2018:11:01:28 -0600] "GET /blog/seo/structure
[11/Dec/2018:11:01:28 -0600] "GET /blog/author/caleb-
[11/Dec/2018:11:01:28 -0600] "GET /about HTTP/1.1" 50
[11/Dec/2018:11:01:28 -0600] "GET /contact HTTP/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /case-study/ppc-cam
[11/Dec/2018:11:01:28 -0600] "GET /about/philosophy H
[11/Dec/2018:11:01:28 -0600] "GET /services/seo HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /services/smb HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/cache/a
[11/Dec/2018:11:01:28 -0600] "GET /resources HTTP/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /tools HTTP/1.1" 50
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/cache/a
[11/Dec/2018:11:01:28 -0600] "GET /blog/seo HTTP/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /services/content H
[11/Dec/2018:11:01:29 -0600] "GET /services/analytics
[11/Dec/2018:11:01:29 -0600] "GET /privacy HTTP/1.1"
[11/Dec/2018:11:01:29 -0600] "GET /blog/internet-mark
[11/Dec/2018:11:01:29 -0600] "GET /wp-content/cache/a
[11/Dec/2018:11:01:29 -0600] "GET /blog HTTP/1.1" 502
[11/Dec/2018:11:01:29 -0600] "GET /ebook/seo/technica
```

# WHAT ARE BEATS?

- Beats are dedicated log parsers and shippers of log data to the Logstash interface
- Beats can be pointed toward a directory of log files and will automatically ingest those log files and send them to Logstash



```
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/
[11/Dec/2018:11:01:28 -0600] "GET /about/careers HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /blog/internet-mark
[11/Dec/2018:11:01:28 -0600] "GET /blog/featured HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /services/ppc HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /services/amazon HTT
[11/Dec/2018:11:01:28 -0600] "GET /case-study/expand-
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/
[11/Dec/2018:11:01:28 -0600] "GET /blog/seo/structure
[11/Dec/2018:11:01:28 -0600] "GET /blog/author/caleb-
[11/Dec/2018:11:01:28 -0600] "GET /about HTTP/1.1" 50
[11/Dec/2018:11:01:28 -0600] "GET /contact HTTP/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /case-study/ppc-cam
[11/Dec/2018:11:01:28 -0600] "GET /about/philosophy H
[11/Dec/2018:11:01:28 -0600] "GET /services/seo HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /services/smb HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/cache/a
[11/Dec/2018:11:01:28 -0600] "GET /resources HTTP/1.1
[11/Dec/2018:11:01:28 -0600] "GET /tools HTTP/1.1" 50
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/cache/a
[11/Dec/2018:11:01:28 -0600] "GET /blog/seo HTTP/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /services/content H
[11/Dec/2018:11:01:29 -0600] "GET /services/analytics
[11/Dec/2018:11:01:29 -0600] "GET /privacy HTTP/1.1"
[11/Dec/2018:11:01:29 -0600] "GET /blog/internet-mark
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[11/Dec/2018:11:01:29 -0600] "GET /blog HTTP/1.1" 502
[11/Dec/2018:11:01:29 -0600] "GET /ebook/seo/technica
```

# BEATS + LOGSTASH

- Simplify the problem of handling log and exception data from distributed sources ( e.g. containers or geolocated data centers )
- Promotes dev-ops portability by freeing IT infrastructure data from hardware



```
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/
[11/Dec/2018:11:01:28 -0600] "GET /about/careers HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /blog/internet-mark
[11/Dec/2018:11:01:28 -0600] "GET /blog/featured HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /services/ppc HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /services/amazon HT
[11/Dec/2018:11:01:28 -0600] "GET /case-study/expand-
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/
[11/Dec/2018:11:01:28 -0600] "GET /blog/seo/structure
[11/Dec/2018:11:01:28 -0600] "GET /blog/author/caleb-
[11/Dec/2018:11:01:28 -0600] "GET /about HTTP/1.1" 50
[11/Dec/2018:11:01:28 -0600] "GET /contact HTTP/1.1"
[11/Dec/2018:11:01:28 -0600] "GET /case-study/ppc-cam
[11/Dec/2018:11:01:28 -0600] "GET /about/philosophy H
[11/Dec/2018:11:01:28 -0600] "GET /services/seo HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /services/smb HTTP/
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/themes/
[11/Dec/2018:11:01:28 -0600] "GET /wp-content/cache/a
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[11/Dec/2018:11:01:28 -0600] "GET /wp-content/cache/a
[11/Dec/2018:11:01:28 -0600] "GET /blog/seo HTTP/1.1"
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[11/Dec/2018:11:01:29 -0600] "GET /services/analytics
[11/Dec/2018:11:01:29 -0600] "GET /privacy HTTP/1.1"
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[11/Dec/2018:11:01:29 -0600] "GET /blog HTTP/1.1" 502
[11/Dec/2018:11:01:29 -0600] "GET /ebook/seo/technica
```



# kibana

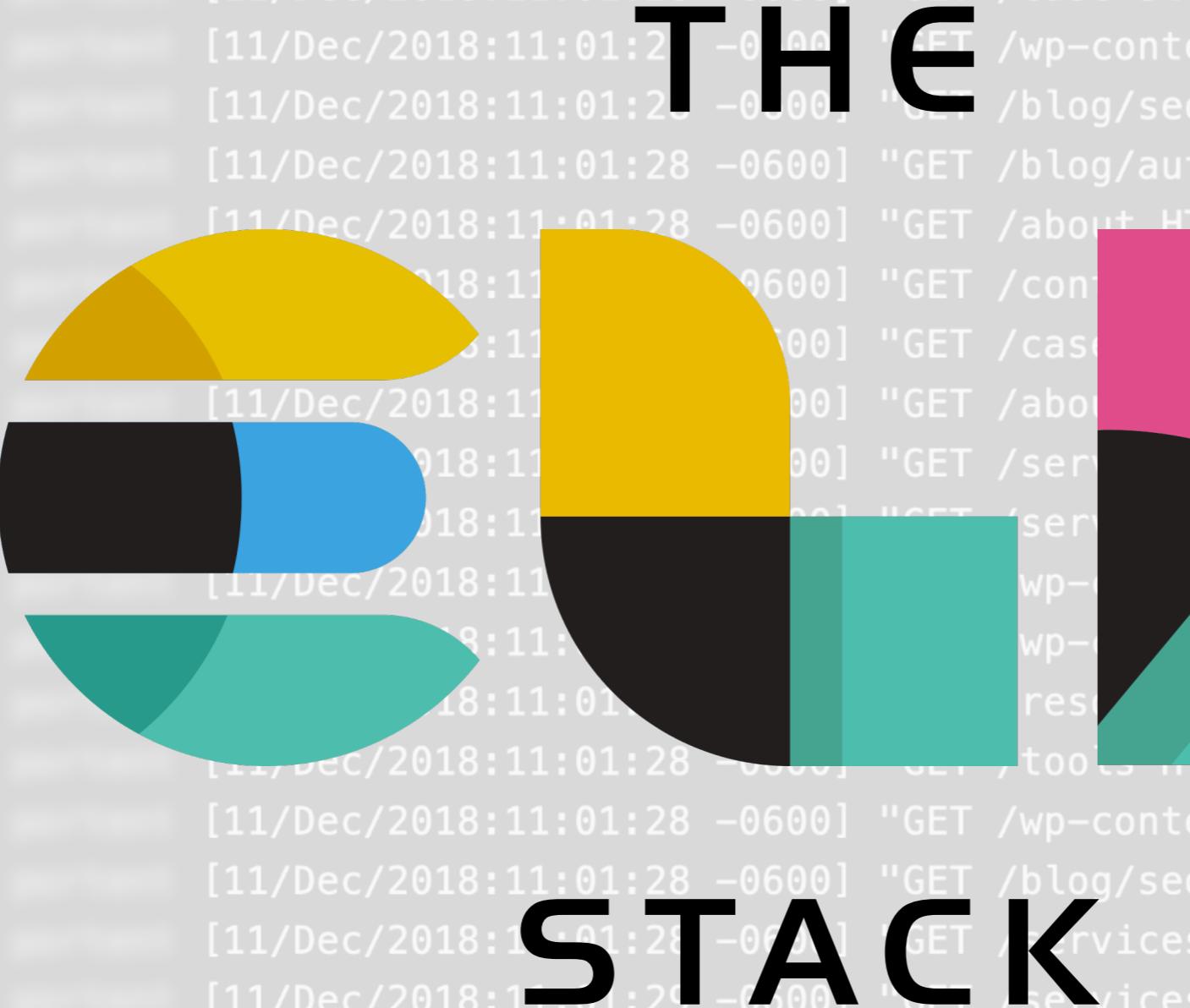


## WHAT IS KIBANA?

- Kibana is a visualization tool for Elasticsearch data
- Can perform queries on data, set up replication, and visualize raw log files
- It is limited in its display of log/exception data



[11/Dec/2018:11:01:28 -0600] "GET /about/careers HTTP/1.1" 502 182 "Scre  
[11/Dec/2018:11:01:28 -0600] "GET /blog/internet-marketing/the\_internet\_mark  
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[11/Dec/2018:11:01:29 -0600] "GET /case-studies HTTP/1.1" 502 182 "-" "Scre  
[11/Dec/2018:11:01:29 -0600] "GET /case-study/linode-cloud-hosting-lead-gene





# STACHEBOX

A LOGGING AND BUG MANAGEMENT  
PLATFORM FOR THE COLDBOX FRAMEWORK

box install stachebox

<https://github.com/coldbox-modules/stachebox>

# PROBLEMS WITH TRADITIONAL CLOUD SAAS OPTIONS

- Request throttling makes anything other than production tier, ERROR level exceptions cost-effective
- One-size fits all display of error meta
- Tracking UI/Javascript errors is difficult because of point #1

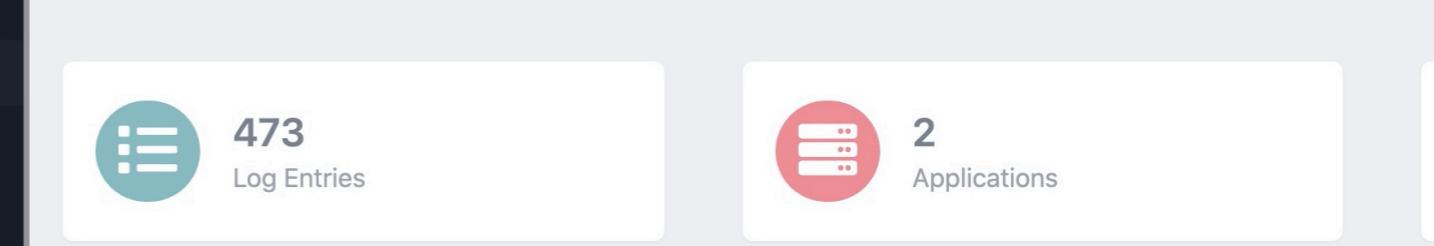


The image shows the Stachebox web interface. At the top, there are two boxes: one for 'Log Entries' (473) and one for 'Applications' (2). Below these is a section titled 'Recent Entries by Application' with a table. The table has columns for TIME, TYPE, QTY, and MESSAGE. It lists several log entries, mostly of type 'TokenNotFoundException'. A large, semi-transparent watermark of the Stachebox logo (a mustached face) is overlaid on the interface.

TIME	TYPE	QTY	MESSAGE
03/12/2020 06:36	TokenNotFoundException	2	Error in base handler (logout): Token not found in auth header or the request collection or not passed in
03/12/2020 06:36	TokenNotFoundException	1	stachebox:api.v1.Authentication.logout: Token not found in auth header or the request collection or not passed in
03/12/2020 06:18	TokenNotFoundException	1	stachebox:api.v1.Authentication.logout: Token not found in auth header or the request collection or not passed in
03/12/2020 06:18	TokenNotFoundException	1	stachebox:api.v1.Authentication.logout: Token not found in auth header or the request collection or not passed in
03/12/2020 06:17	TokenNotFoundException	1	stachebox:api.v1.Authentication.logout: Token not found in auth header or the request collection or not passed in
Showing 1 to 5 of 6 results			
2e6d158cc46f841b574e46			
TIME	TYPE	QTY	MESSAGE
03/12/2020 00:01:34	Expression	1	Error calling stachebox:api.v1.Logs.index: No matching arguments found
03/12/2020 01:31	Java.lang.illegalargumentexception	1	Error calling stachebox:api.v1.Logs.index: Cannot find argument named [args]
03/12/2020 01:30	Expression	1	Error calling stachebox:api.v1.Logs.index: Compiling expression [stachebox.models.services.LogSearchService] had error [TIMESTAMPFORMATTER]
02/12/2020 09:13	Expression	1	Error calling stachebox:api.v1.Logs.index: The argument [1E2B577177CAE62E8A2652CE7AAF4044] does not exist
02/12/2020 09:03	Expression	1	Error calling stachebox:api.v1.Logs.index: No matching arguments found
Showing 1 to 5 of 154 results			
Max: 5			

# WHAT IS STACHEBOX

- StacheBox is the new bug and log management platform for the Coldbox Framework
- It can run as a module within an app or as an entire application
- It can aggregate data between multiple log indexes and track occurrences



The image shows the Stachebox web interface. At the top, there are two boxes: one for 'Log Entries' (473) and one for 'Applications' (2). Below these, a section titled 'Recent Entries by Application' displays log entries for 'Stacheboxtestingsuite'. The table has columns for TIME, TYPE, QTY, and MESSAGE. The first entry is a 'Tokennotfoundexception' from 03/12/2020 at 06:36. The second entry is also a 'Tokennotfoundexception' from the same time. The third entry is a 'Tokennotfoundexception' from 06:18. The fourth entry is a 'Tokennotfoundexception' from 06:17. The fifth entry is a 'Tokennotfoundexception' from 06:17. The sixth entry is a 'Tokennotfoundexception' from 06:17. A large blue mustache icon is overlaid on the right side of the log table. Below the log table, another section titled 'Recent Entries by Application' displays log entries for '2e6d158cc46f841b574e46'. The table has columns for TIME, TYPE, QTY, and MESSAGE. The first entry is an 'Expression' from 03/12/2020 at 00:31:34. The second entry is a 'Java.lang.illegalargumentexception' from 03/12/2020 at 01:31. The third entry is an 'Expression' from 03/12/2020 at 01:30. The fourth entry is an 'Expression' from 02/12/2020 at 09:13. The fifth entry is an 'Expression' from 02/12/2020 at 09:03. A large blue mustache icon is overlaid on the right side of the log table.

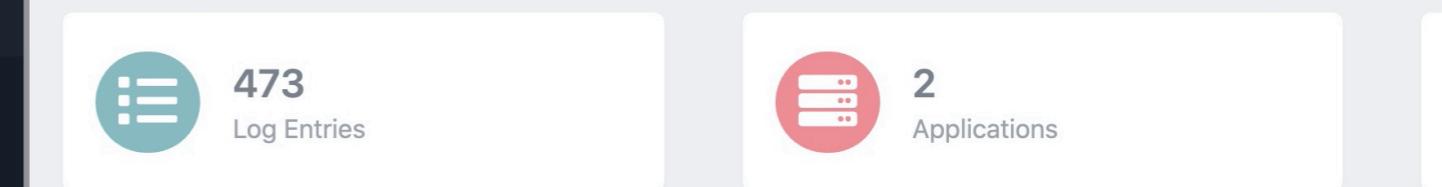
TIME	TYPE	QTY	MESSAGE
03/12/2020 06:36	Tokennotfoundexception	2	Error in base handler (logout): Token not found in auth header or the request collection or not passed in
03/12/2020 06:36	Tokennotfoundexception	1	Stachebox:api.v1.Authentication.logout: Token not found in auth header or the request collection or not passed in
03/12/2020 06:18	Tokennotfoundexception	1	Stachebox:api.v1.Authentication.logout: Token not found in auth header or the request collection or not passed in
03/12/2020 06:18	Tokennotfoundexception	1	Stachebox:api.v1.Authentication.logout: Token not found in auth header or the request collection or not passed in
03/12/2020 06:17	Tokennotfoundexception	1	Stachebox:api.v1.Authentication.logout: Token not found in auth header or the request collection or not passed in
03/12/2020 06:17	Tokennotfoundexception	1	Stachebox:api.v1.Authentication.logout: Token not found in auth header or the request collection or not passed in
03/12/2020 06:17	Tokennotfoundexception	1	Stachebox:api.v1.Authentication.logout: Token not found in auth header or the request collection or not passed in
Showing 1 to 5 of 6 results			

TIME	TYPE	QTY	MESSAGE
03/12/2020 00:31:34	Expression	1	Error calling stachebox:api.v1.Logs.index: No matching document found with the given arguments and
03/12/2020 01:31	Java.lang.illegalargumentexception	1	Error calling stachebox:api.v1.Logs.index: Cannot find argument [1E2B577177CAE62E8A2652CE7AAF4044]
03/12/2020 01:30	Expression	1	Error calling stachebox:api.v1.Logs.index: Command [stachebox.models.services.LogSearchService] has [TIMESTAMPFORMATTER]
02/12/2020 09:13	Expression	1	Error calling stachebox:api.v1.Logs.index: The document with id [1E2B577177CAE62E8A2652CE7AAF4044] does not exist
02/12/2020 09:03	Expression	1	Error calling stachebox:api.v1.Logs.index: No matching document found with the given arguments and [1E2B577177CAE62E8A2652CE7AAF4044]
Showing 1 to 5 of 154 results			

# WHAT IS STACHEBOX

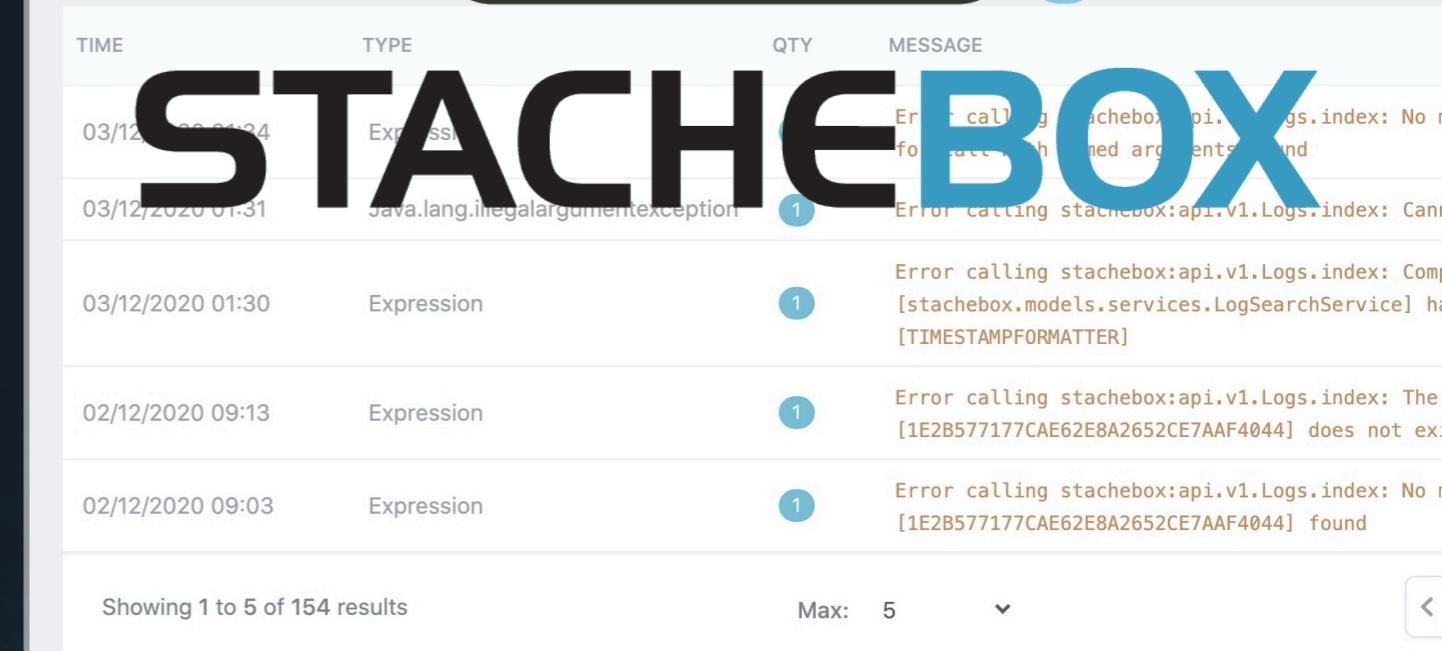
- Stachebox is both a consumer and a provider of log data to Elasticsearch
- It has its own JTW infrastructure, which allows UI errors to be trapped and logged



The screenshot shows the Stachebox user interface. At the top, there are two cards: one for 'Log Entries' (473) and one for 'Applications' (2). Below these, a section titled 'Recent Entries by Application' displays log entries for 'Stacheboxtestingsuite54f051765e3df2d2b83ef381f0ac76b2'. The table columns are TIME, TYPE, QTY, and MESSAGE. The first entry is a 'Tokennotfoundexception' from 03/12/2020 at 06:36. The second entry is also a 'Tokennotfoundexception' from the same time. The third entry is a 'Tokennotfoundexception' from 06:18. The fourth entry is a 'Tokennotfoundexception' from 06:18. The fifth entry is a 'Tokennotfoundexception' from 06:17. The bottom of this section shows 'Showing 1 to 5 of 6 results'.



The logo features a black rectangular background with a blue mustache and a blue magnifying glass. A blue line connects the mustache to the magnifying glass.



The screenshot shows the Stachebox user interface displaying log entries for another application. The table columns are TIME, TYPE, QTY, and MESSAGE. The first entry is an 'ExpressionException' from 03/12/2020 at 00:31:34. The second entry is a 'Java.lang.illegalargumentexception' from 03/12/2020 at 01:31. The third entry is an 'ExpressionException' from 03/12/2020 at 01:30. The fourth entry is an 'ExpressionException' from 02/12/2020 at 09:13. The fifth entry is an 'ExpressionException' from 02/12/2020 at 09:03. The bottom of this section shows 'Showing 1 to 5 of 154 results'.

# GETTING STARTED:

box install stachebox

<https://github.com/coldbox-modules/stachebox>

**HANDS - ON  
TEST - DRIVE!**

# QUESTIONS AND ANSWERS

