ELK

Elasticsearch, Logstash and Kibana at Wikimedia

Not this kind of Elk

https://commons.wikimedia.org/wiki/File:Male_Elk_%288005280487%29.jpg

E is for elasticsearch.

Document oriented full text search engine built on top of Apache Lucene.

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L is for logstash

Pipeline processing system that connects "inputs" to "outputs" with optional "filters" in between.

```
$ tail -f foo.log | grep bar |
  awk '{print $7 $9}' >> foo-pretty.log
```

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K is for

Browser based analytics and search dashboard for Elasticsearch.

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How Wikimedia uses ELK

- Log events sent to Logstash by various applications.
- Logstash processes events to clean them up and normalize things where we can.
- Logstash stores events in Elasticsearch.
- Logstash sends some metrics to statsd for trend reporting.
- Use Kibana to search log events from Elasticsearch.
- Icinga alerts to watch for bad trends.

Logstash inputs

- Apache2 & HHVM via rsyslog
- MediaWiki via Monolog and Syslog handler
- scap via log2udp forwarding
- Various nodejs services via Bunyan and gelf-stream
- Cassandra via Logback
- (Beta cluster) Puppet via custom Report plugin
- (Beta cluster) Syslog
- (Labs) IRC
- Many others possible...

Logstash filters

- Strip ansi color escape sequences
- Join sequential lines into a single event for some types
- Normalizations to populate common attributes:
  - **type**: Origin (eg mediawiki, apache2, hhvm)
  - **channel**: Event type (eg memcached, proxy_fcgi)
  - **level**: Severity (eg INFO, WARNING, ERROR
- Normalize event level naming to PSR-3 standard
- Discard junk messages
- Many others possible...

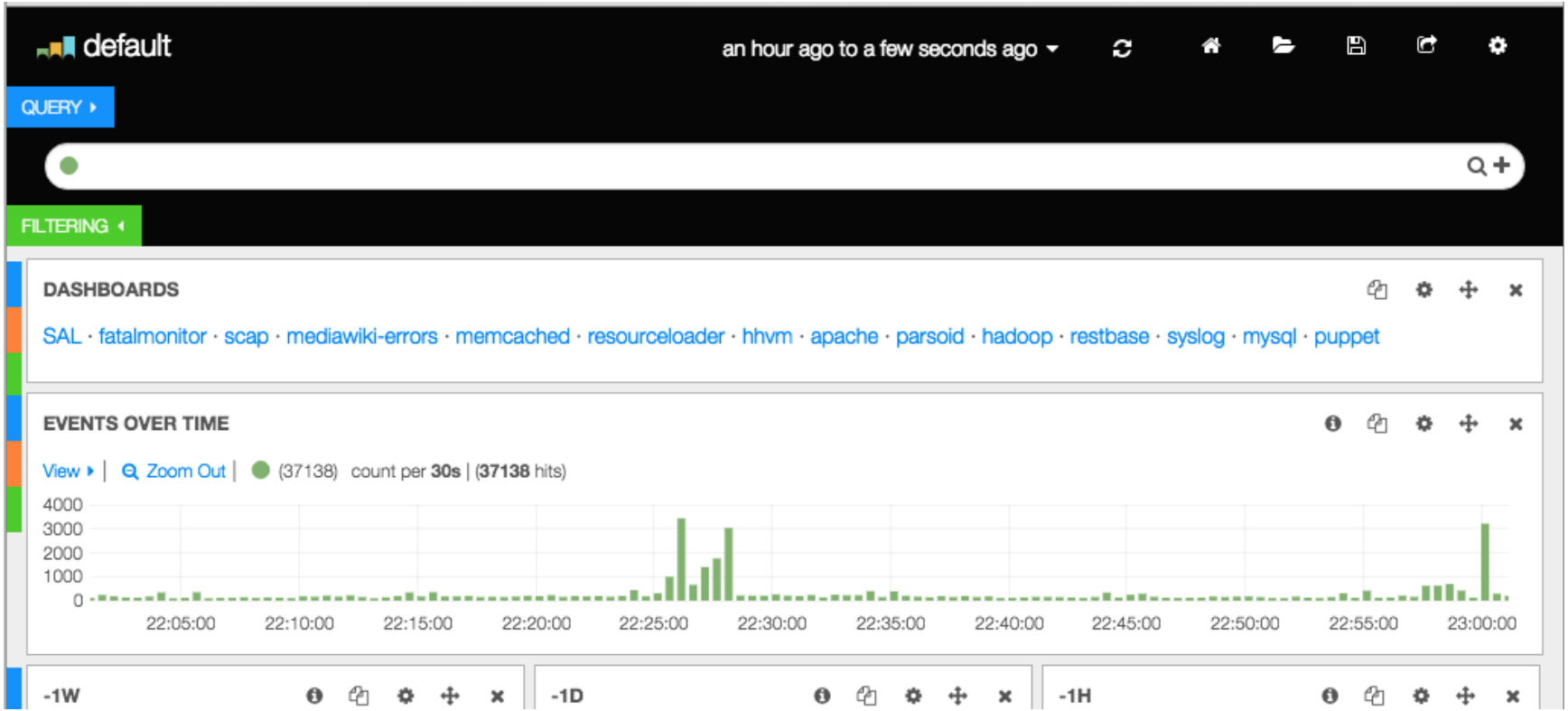
Logstash outputs

- Local Elasticsearch cluster
- Remote Elasticsearch cluster
- Statsd metrics for Graphite storage
- Many others possible...

Using Kibana

- WMF production: https://logstash.wikimedia.org/
  - Requires a signed NDA because of access to potentially sensitive data.
- WMF Beta cluster: https://logstash-beta.wmflabs.org/

Using Kibana



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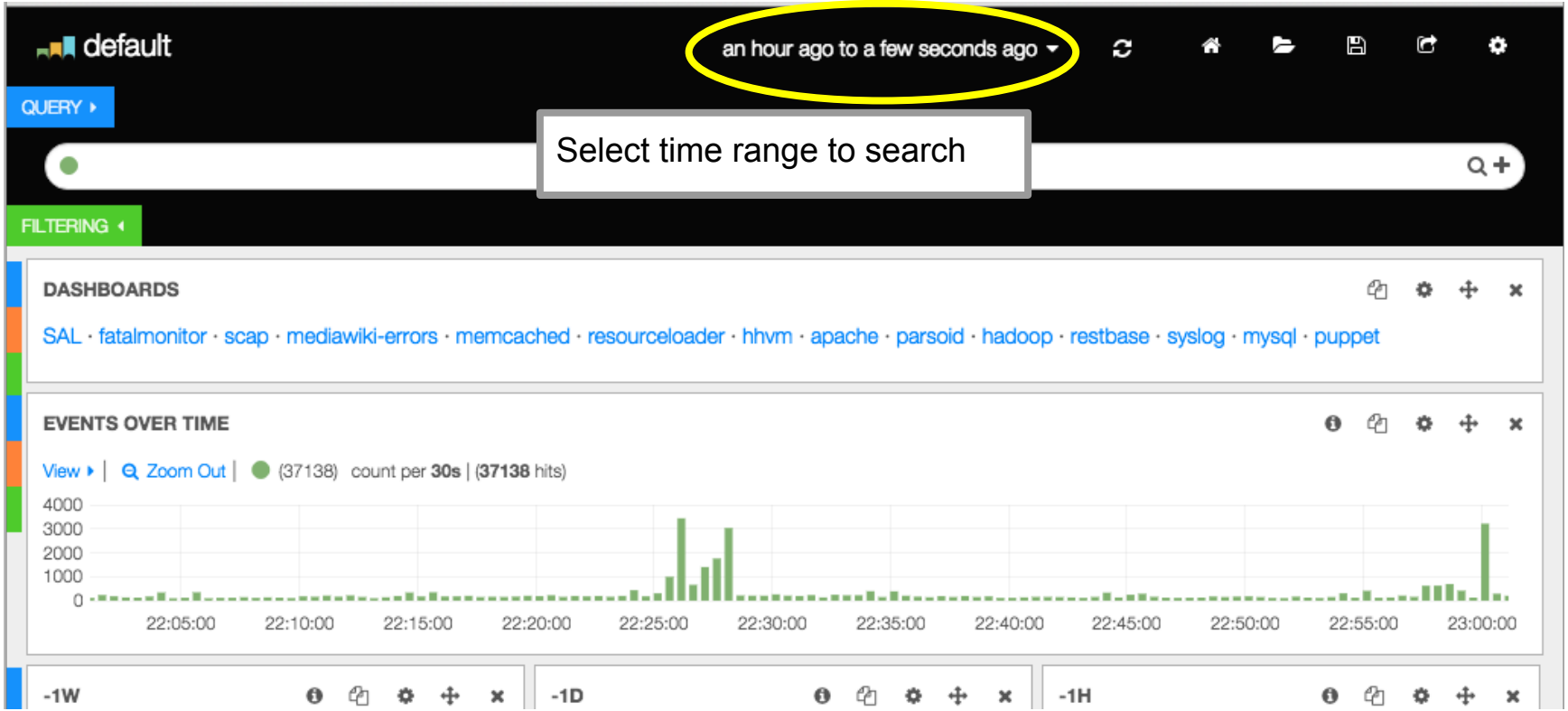

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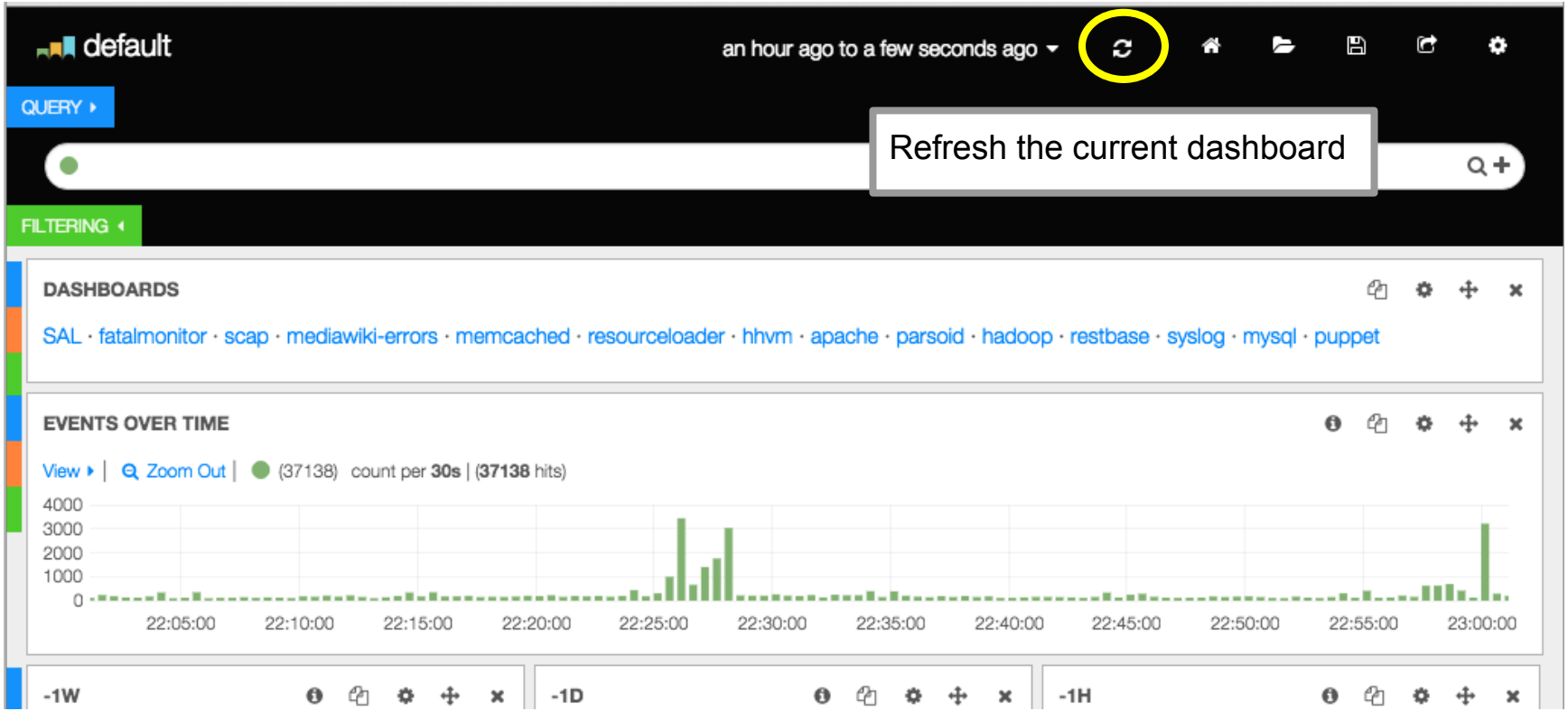

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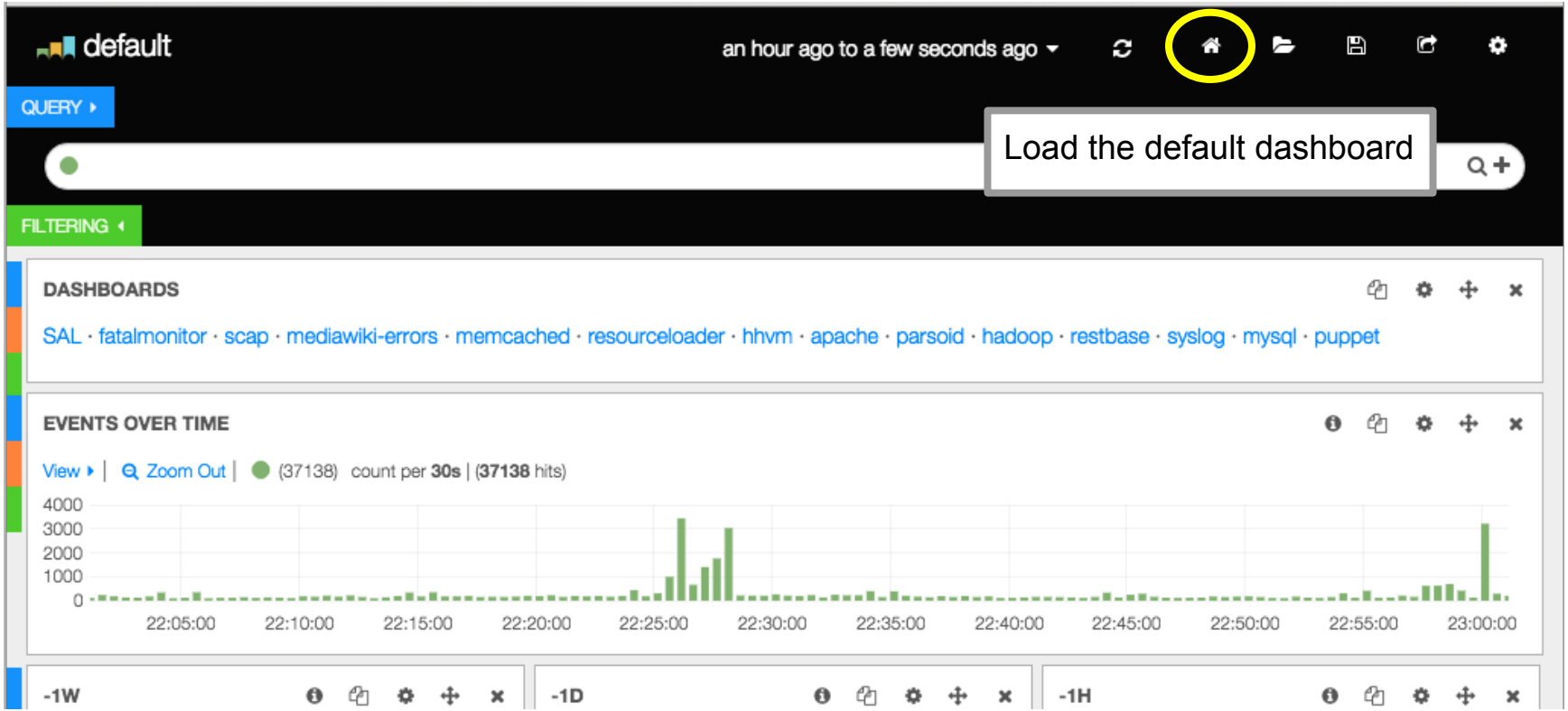

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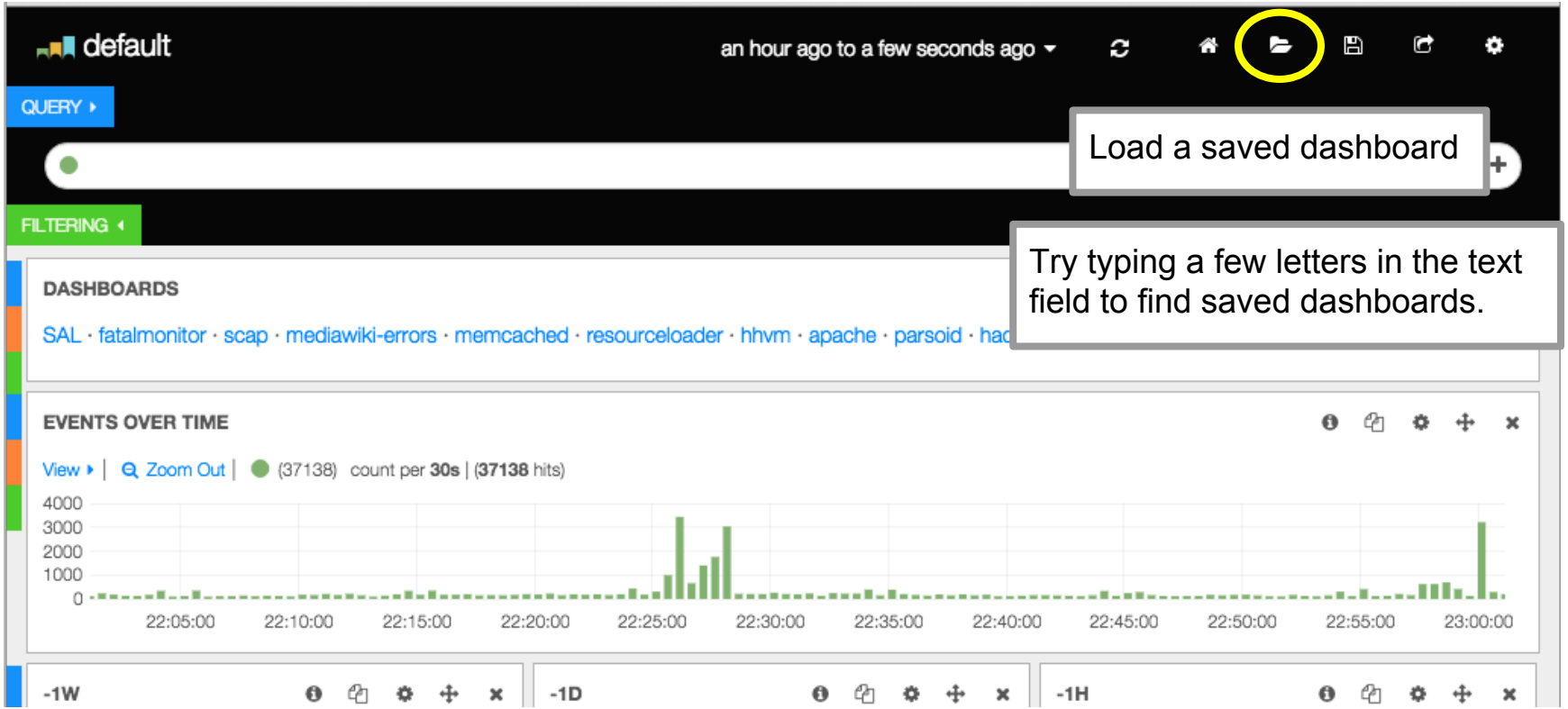

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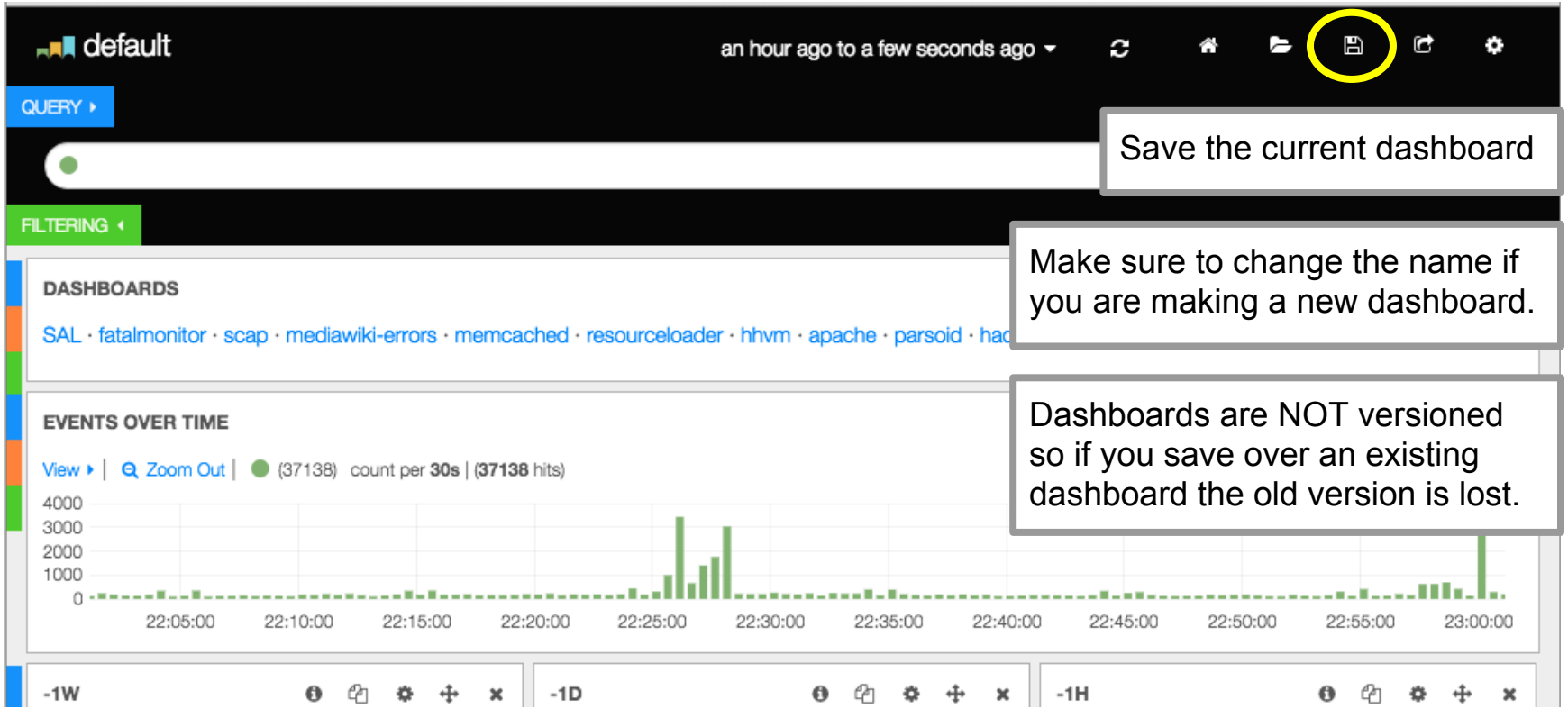

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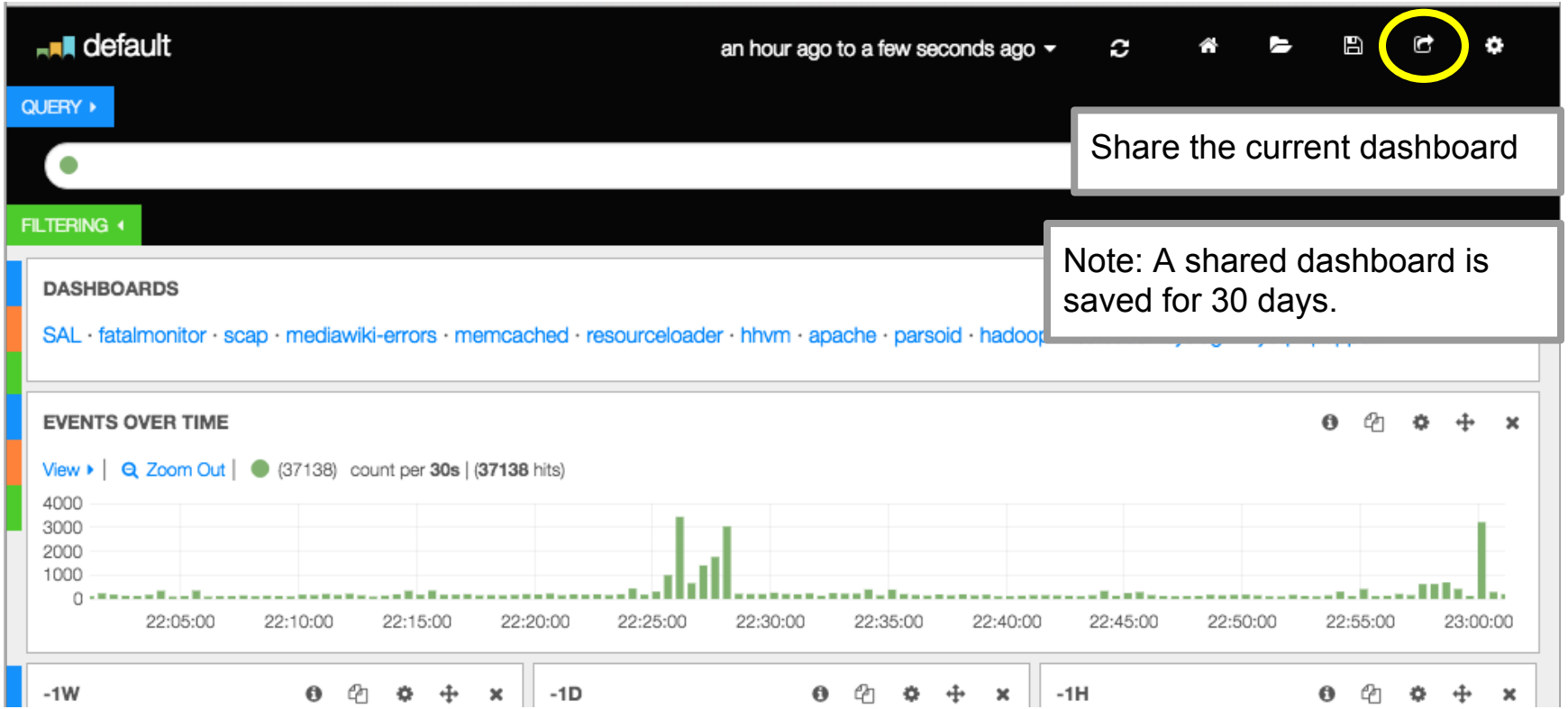

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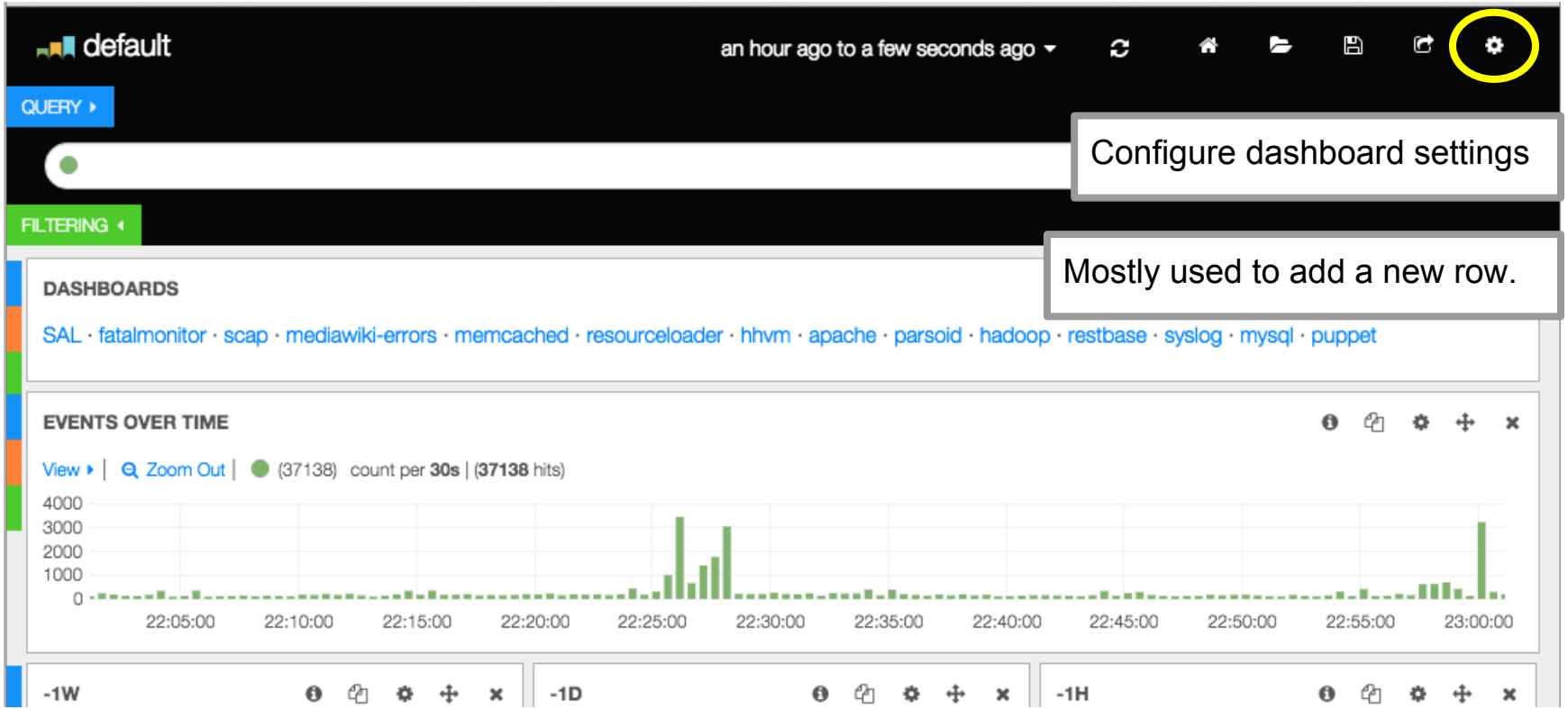

Using Kibana

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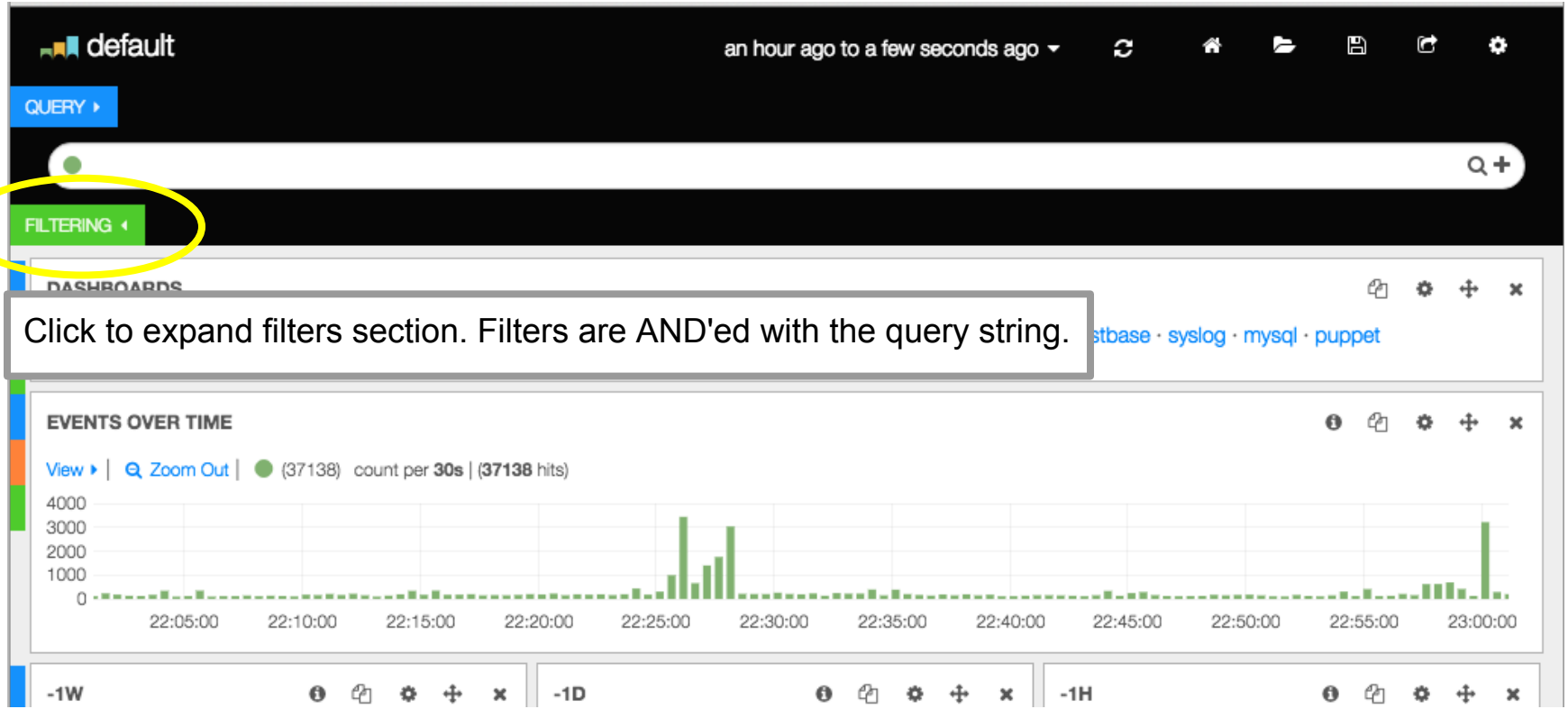

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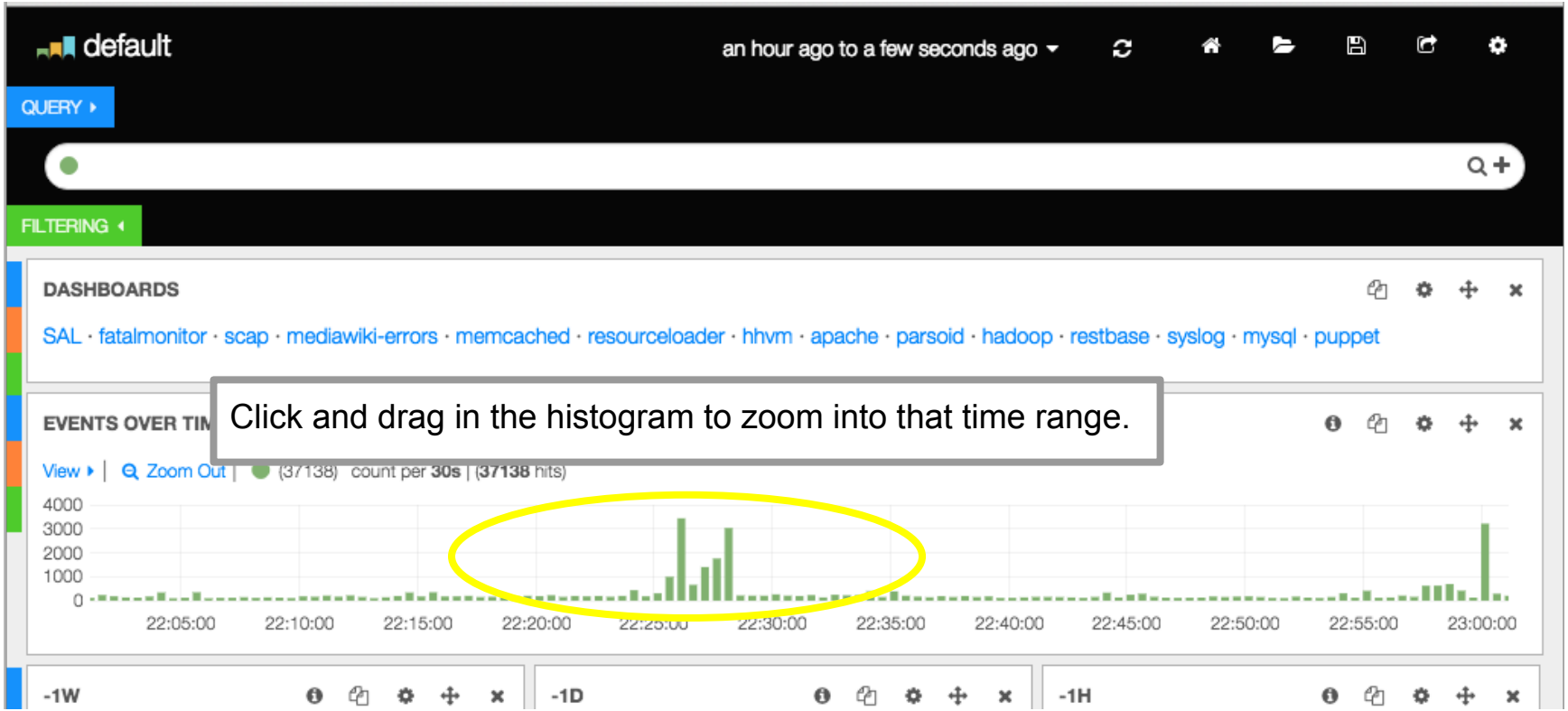

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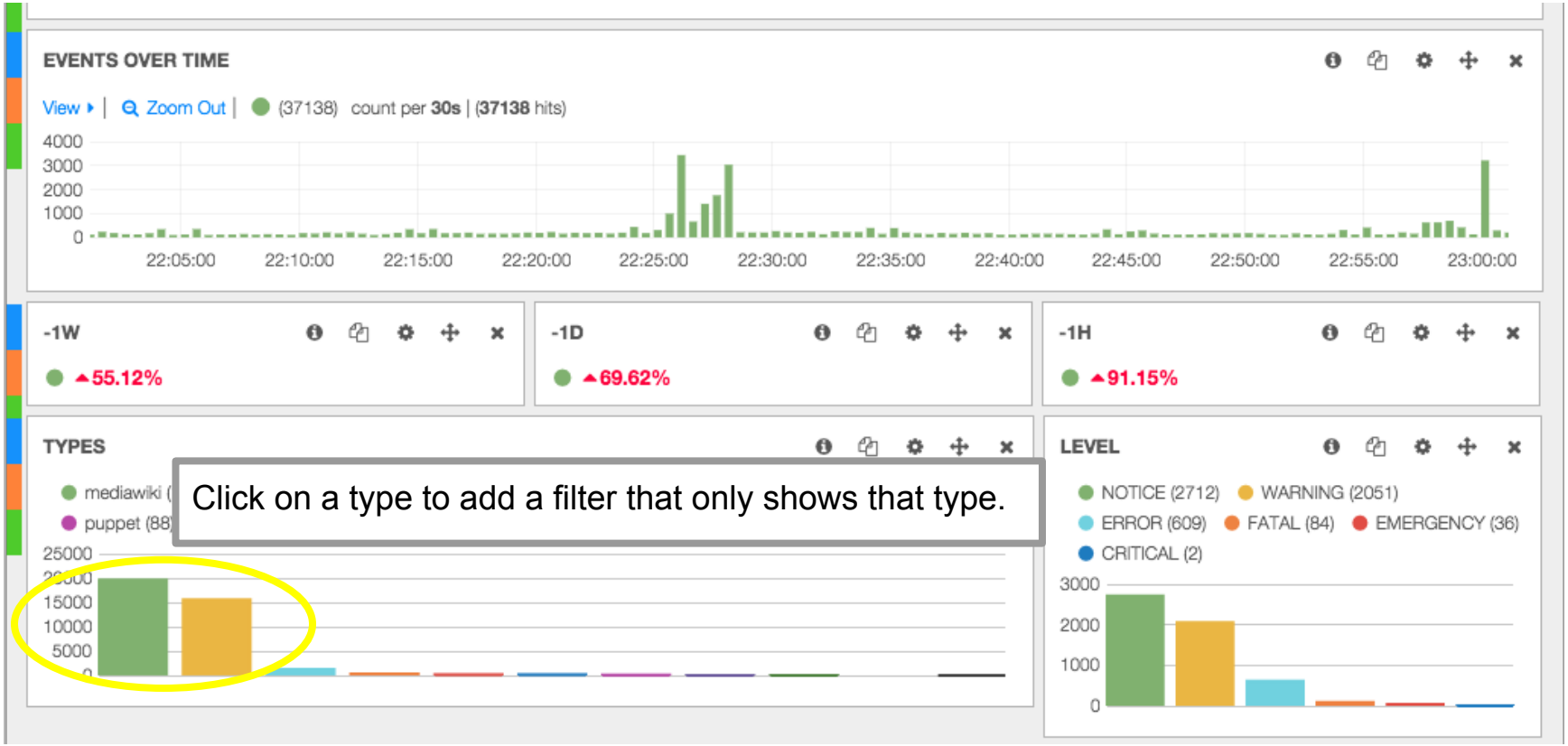

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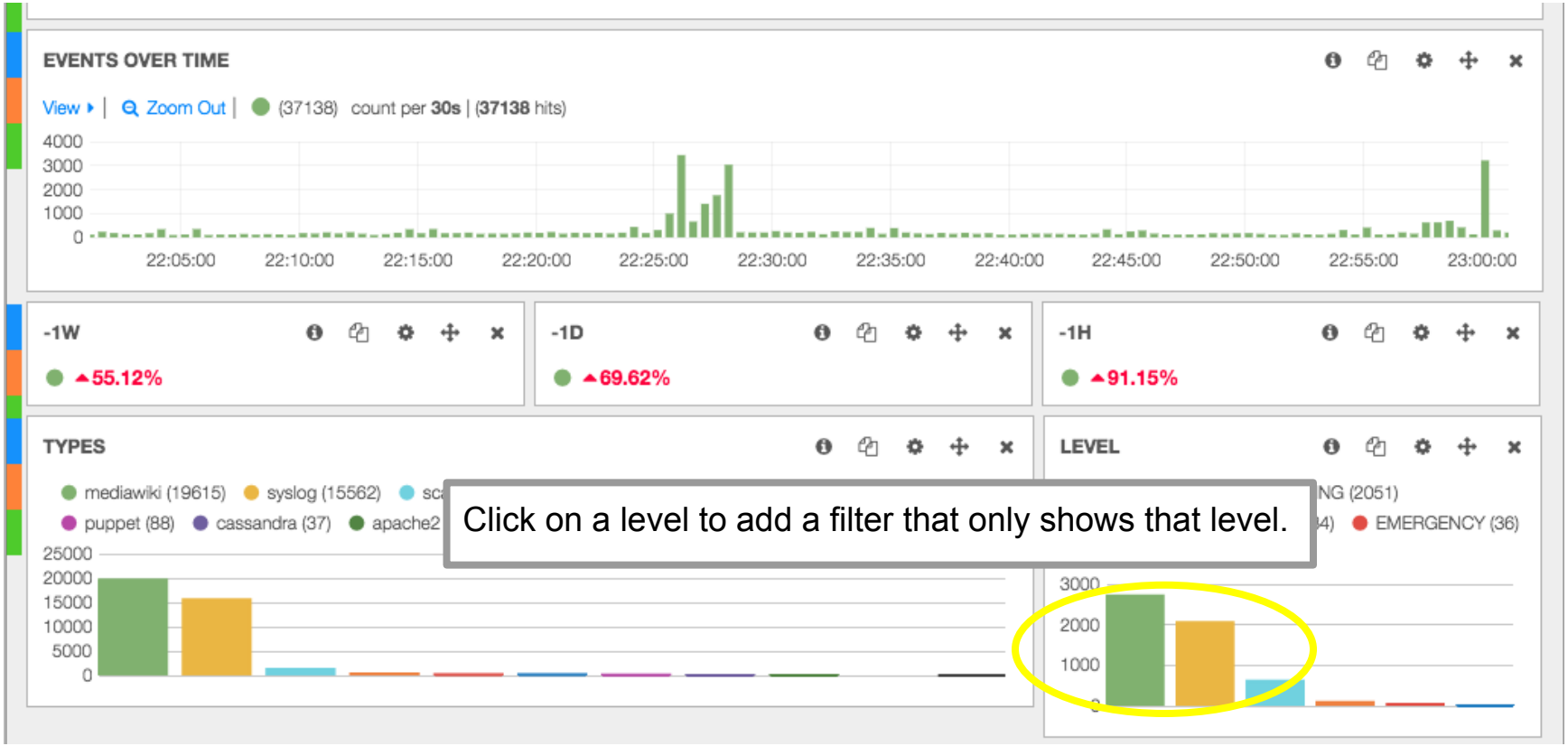

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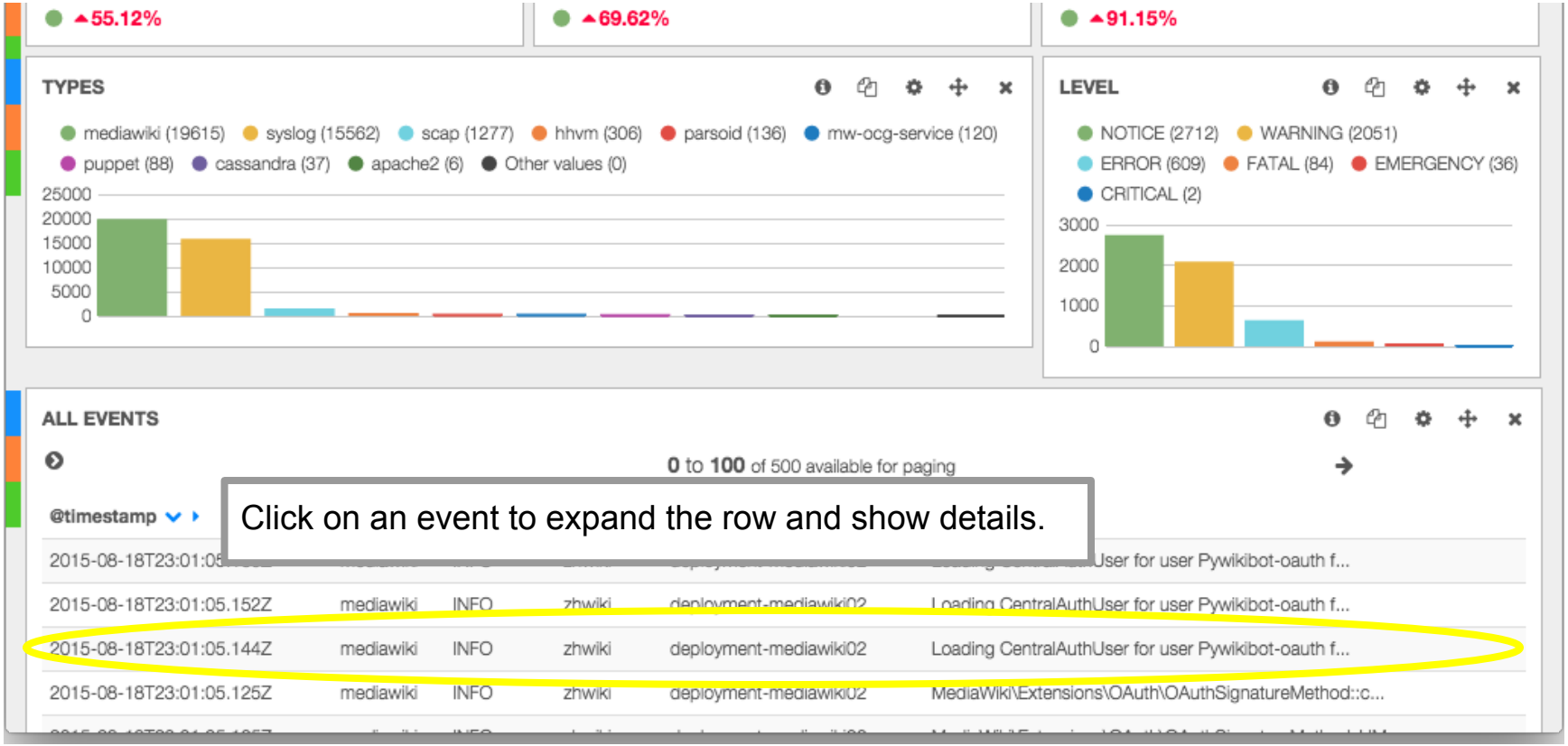

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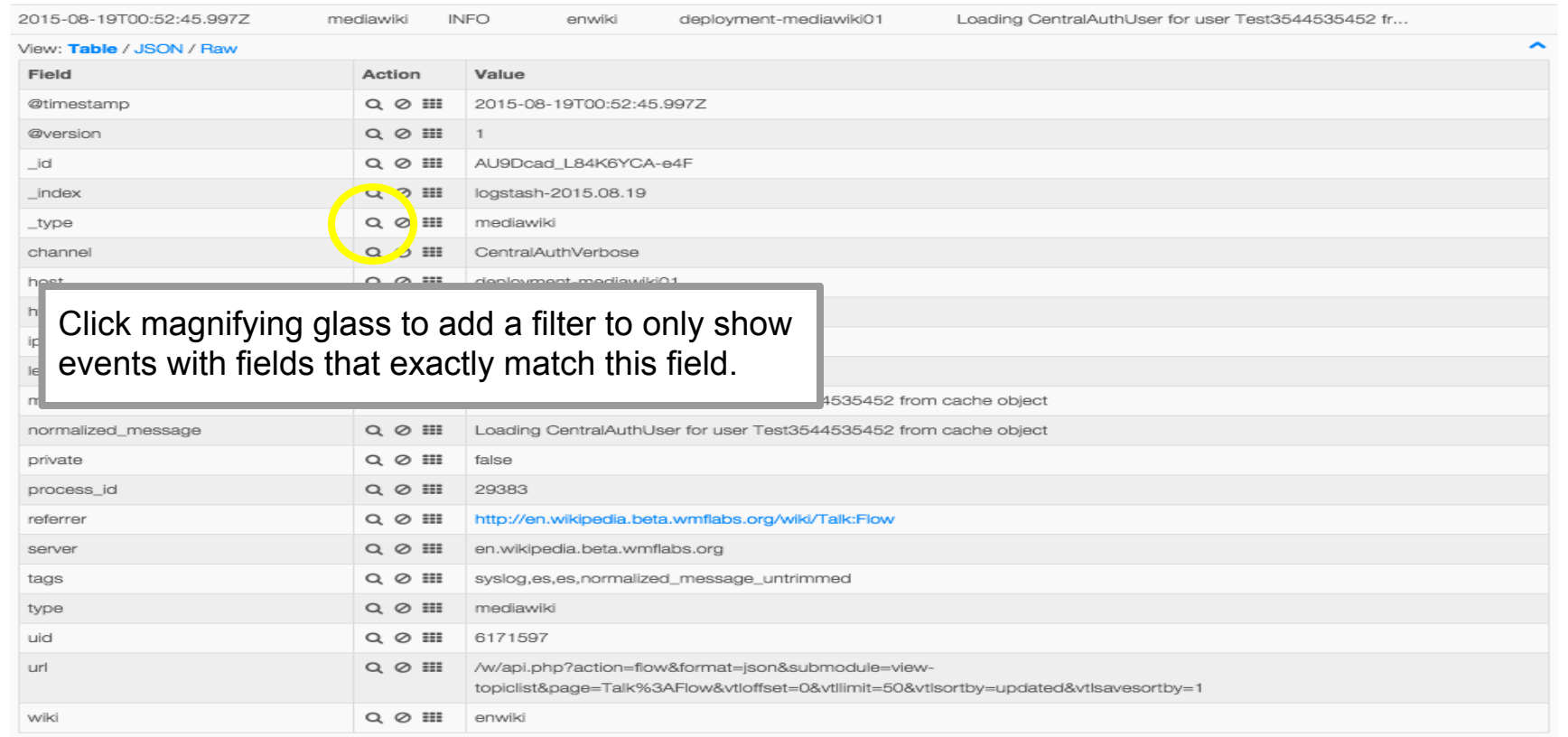

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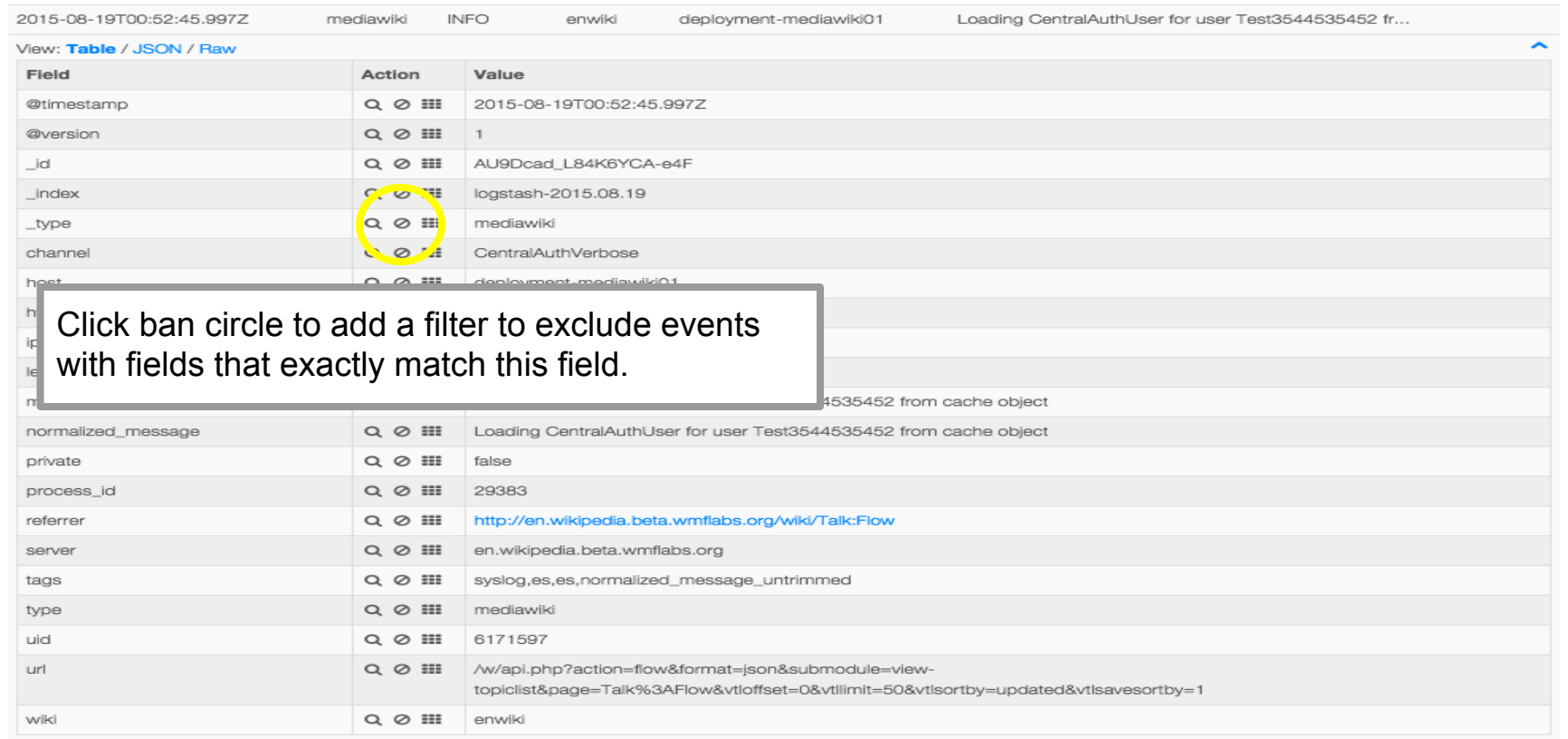

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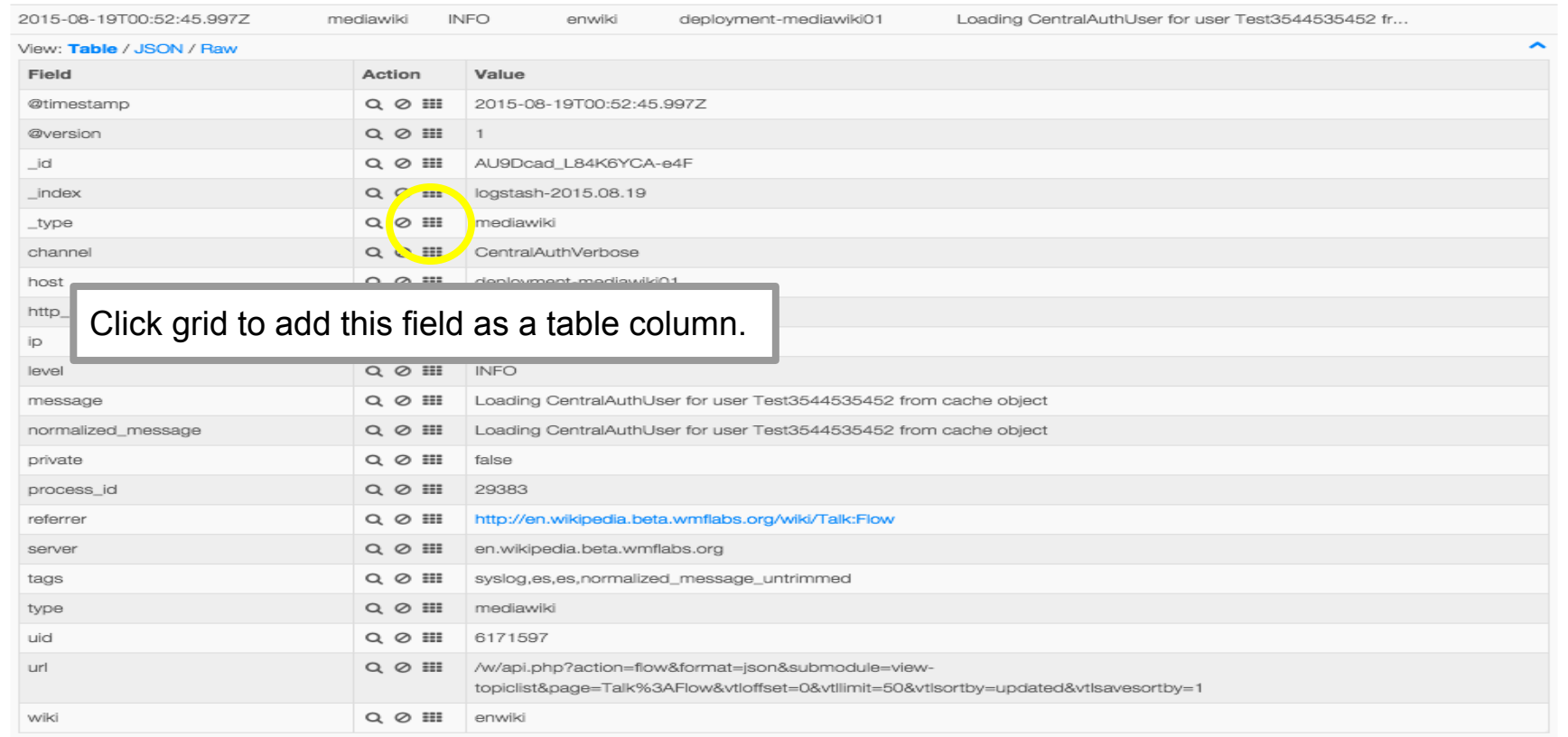


Search tips

- Equivalent of /a/mw-log/fatal.log on fluorine:
  - `type:mediawiki AND channel:fatal`
- In general:
  - `type:mediawiki AND channel:$logGroup`
- If you get no results:
  - try a larger time range
  - check for filters in the collapsed filter section
- Shorter time ranges == faster searches

Better log output from MediaWiki

```php
<?php
use MediaWiki\Logger\LoggerFactory;

$logger = LoggerFactory::getInstance( "channel_name" );

$logger->debug( "Something too spammy for prod logging" );
$logger->info( "Valuable state change info" );
$logger->warning( "Soft error condition" );
$logger->error( "Hard error that needs attention" );
```

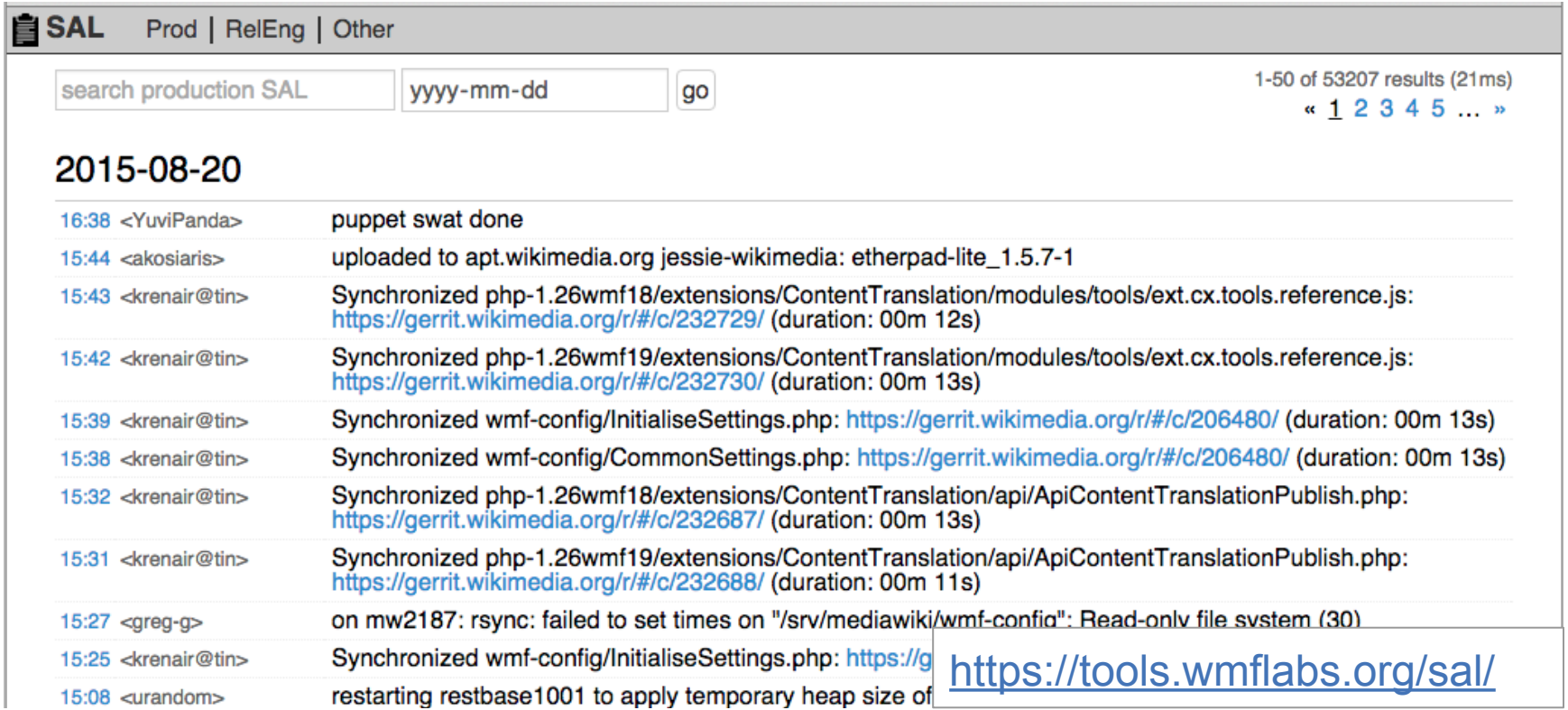
Adding context to messages

```php
<?php

$logger->info( "Valuable state change", array(
        'thing' => $thing,
        'method' => __METHOD__,
        'line' => __LINE__,
) );

$logger->error( "Badness {exception}", array(
        'exception' => $exception,
) );
```

More fun with Logstash



More fun with Logstash

https://tools.wmflabs.org/bash/

Learning more

- https://www.elastic.co/
- https://www.elastic.co/webinars/introduction-elk-stack
- https://www.elastic.co/guide/en/kibana/3.0/index.html
- https://wikitech.wikimedia.org/wiki/Logstash
- https://phabricator.wikimedia.org/tag/elk/
- https://phabricator.wikimedia.org/diffusion/OPUP/browse/production/files/logstash/
- https://www.mediawiki.org/wiki/Structured_logging
- https://phabricator.wikimedia.org/tag/psr3/

Credits

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