Monitoring

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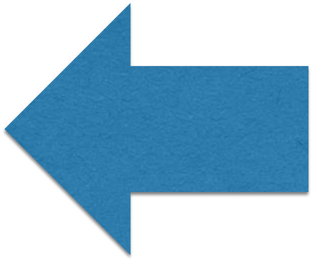
THE ATTENDANTS WILL LEARN...

- Monitoring basics
- Traditional vs Modern monitoring
- Challanges of monitoring at scale
- What to monitor for DevOps?
- Microservices monitoring rules
- Elastic Stack fundamentals

What is monitoring?

Monitoring Topics

- Customer happiness
- Cost efficiency



We´ll talk about this for this class

- Safety and security
- Compliance

Customer Happines

- Time to value (features in front of client)
- Availability
- Response time

Cost Efficiency

- Utilization
- Optimization
- Automation

A standard for monitoring

Frontmatter

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Preface

This Document

This X/Open Guide reviews the problem space of performance measurement in open systems, and introduces the architecture, features and benefits provided by the three X/Open Universal Measurement Architecture (UMA) specifications:

Traditional Monitoring

- The traditional monitoring approach tests just whether something is 'up' or 'down’;
- Agents inside: Hardware, Mainframe, VMs

Modern monitoring

- If a single component within a microservice architecture fails, there may be no **business impact**, and so **the severity of alert should match this fact**.
- Containers, events (serverless).

Challenges: Aggregation

- Consolidating different (or without) log formats coming from a lot of containers or events with different proposal of visibility

Distribution: Interdependence

- Maintain operational health and doing Root Cause Analysis on a large ecosystem (many containers or events) at scale becomes challenging.

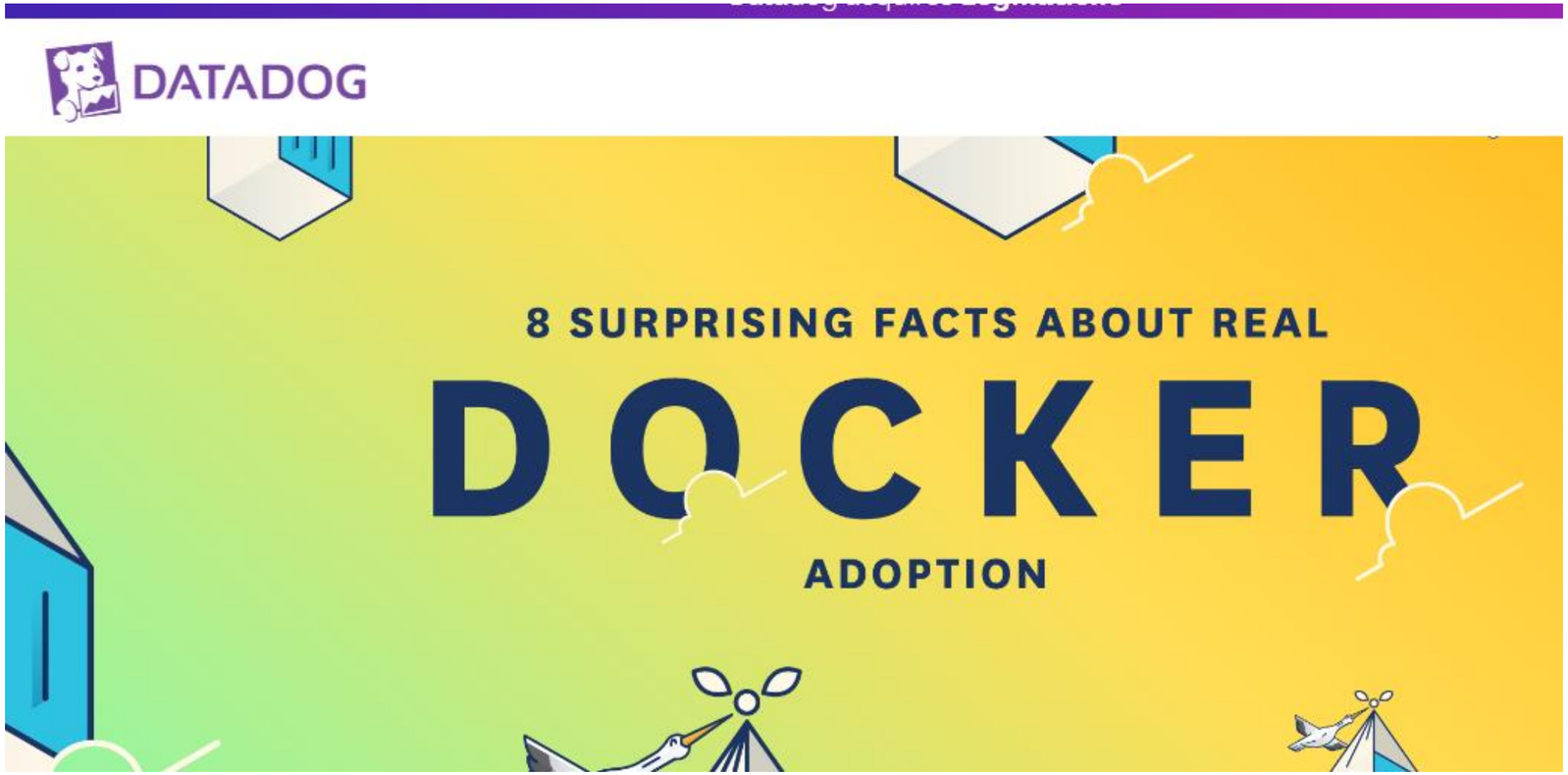
Frequency of change: ephemerality

- The short lifetime of containers or events has been considered a big challenge in modern monitoring.

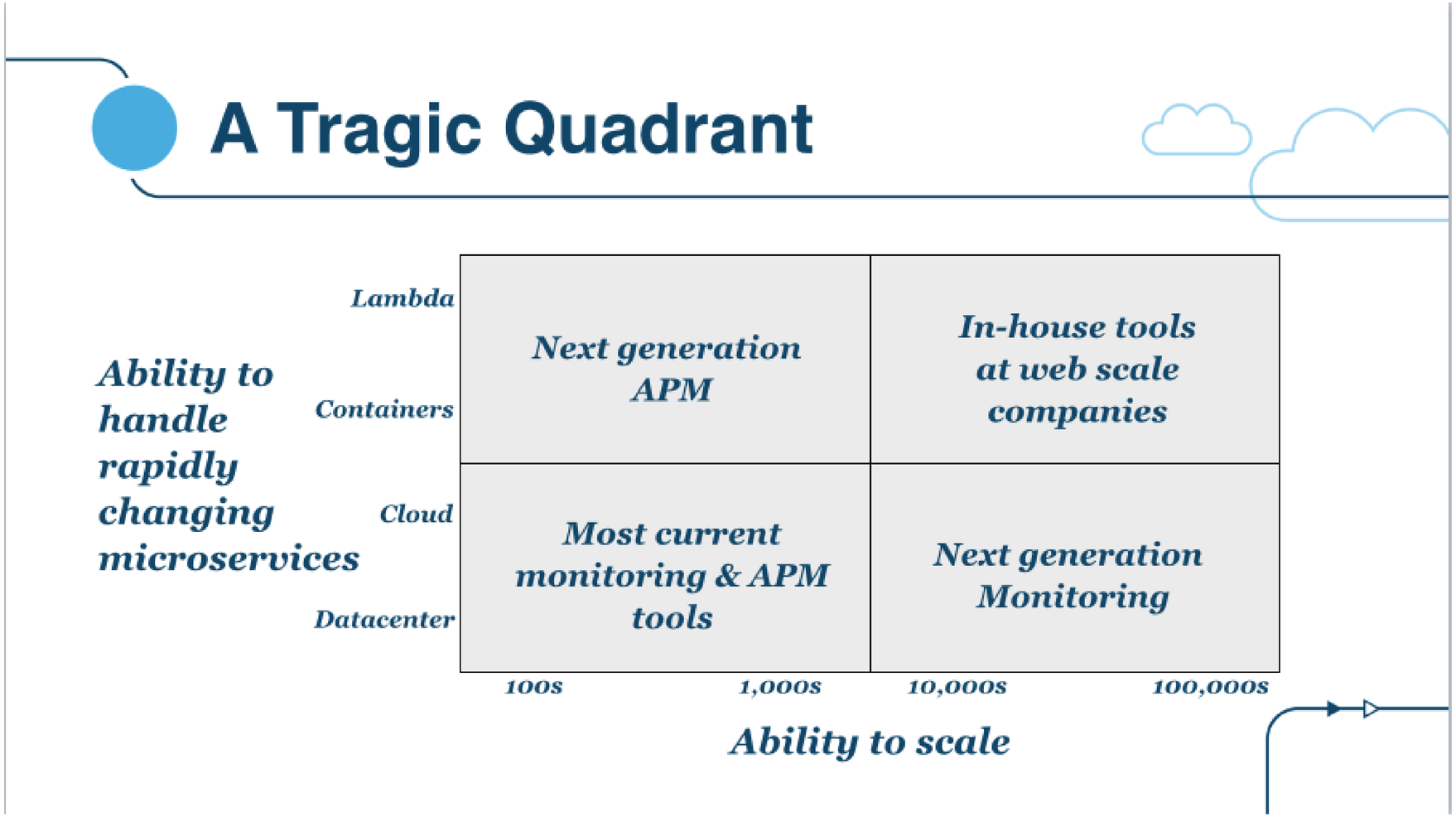
Umpredictable

- We don’t know where the container. Has the Kubernetes moved Nginx to another zone?

Tips: 7 containers per host



The Adrian's Tragic Quadrant



From: https://www.battery.com/powered/bigpanda-analyzing-the-monitoringscape/

What to monitor? from orquestrators

- Swarm,
- mesos,
- kubernetes

What to monitor? anomalies

- Monitoring systems have to learn normal behavior and indicate when system behavior is not normal.

Rules for microservices

- Spend more time working on code that analyses the meaning of metrics than code that collects, moves, stores and displays metrics
- Reduce key business metric latency to less than the human attention span (~10s)
- Validate your measurement system has enough accuracy and precision. Collect histograms of response time
- Monitoring systems need to be more available and scalable than the systems (and services) being monitored
- Optimise for monitoring distributed, ephemeral, 'cloud-native', containerised microservices
- Fit metrics to models in order to understand relationships (this is a new rule)

From: https://github.com/adrianco

Hands on phase

Monitoring with Elastic Stack

What is a log?

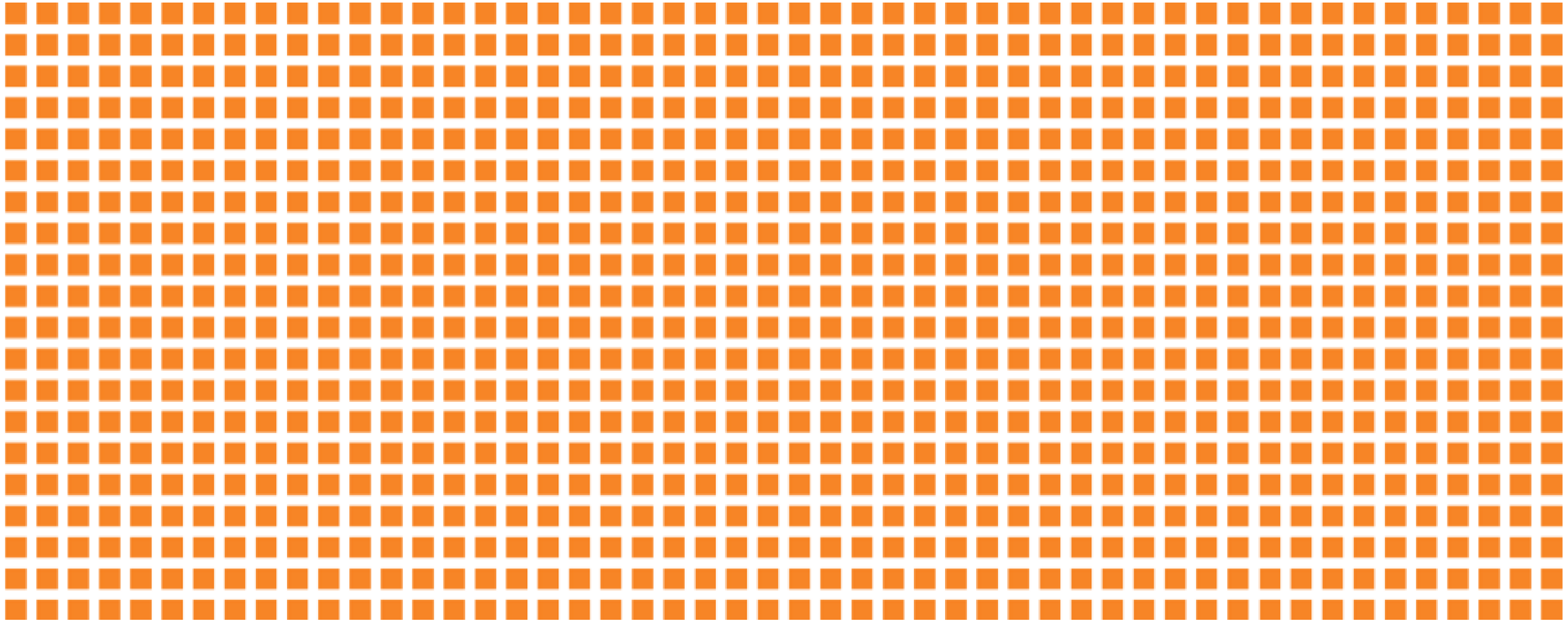
A log is an event

- Log lines
- Twitter feed
- Invoices
- Metrics

Exercise 1

- Reading logs from containers

At scale



1000 EC2 Instances in a Cluster

grep

- Multiple machines
- Multiple logs
- Analysis/Discovery
- Time Period

Different point of views

apache

```
[23/Jan/2014:17:11:55 +0000]
```

unix timestamp

```
1390994740
```

log4j

```
[2014-01-29 12:28:25,470]
```

postfix.log

```
Feb 3 20:37:35
```

ISO 8601

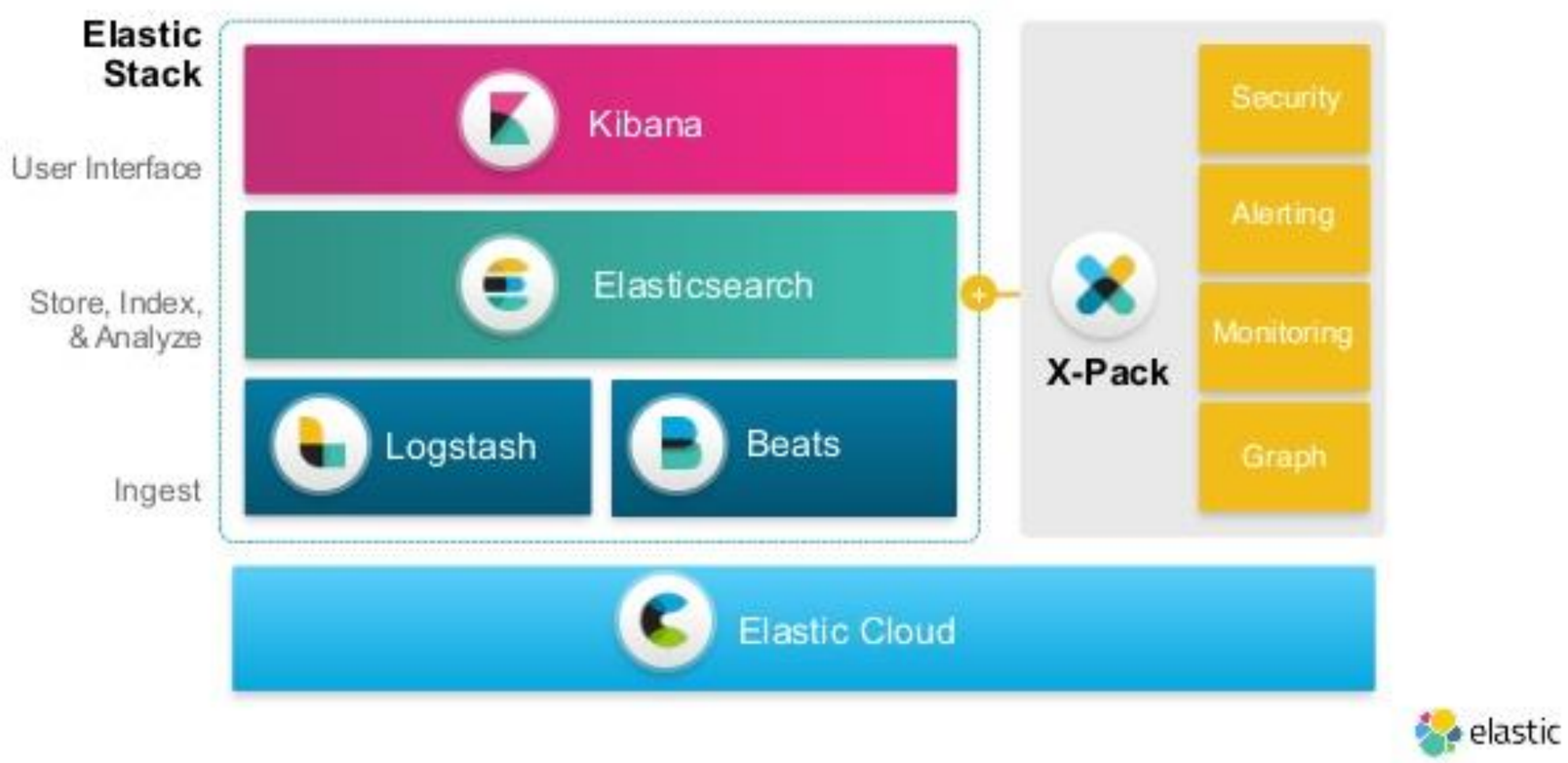
```
2009-01-01T12:00:00+01:00
```

A Centralized logging approach can help you

- Collect data
- Parse data
- Enrich data
- Store data
- Search and aggregate
- Visualize data

An ecosystem as response: Elastic Stack

The Elastic Stack is a set of tools developed by Elastic to provide monitoring (nowadays).



Some Elastic Stack features

- A business centric monitoring;
- Integration-driven (flexbility to get logs from everywhere);
- Taming decentralization;
- Process (indexing) and search near real-time data;
- Use analytics to summarize data across dimensions

Logstash : inputs

Monitoring	collectd, graphite, ganglia, snmptrap, zenoss
Datastores	elasticsearch, redis, sqlite, s3
Queues	kafka, rabbitmq, zeromq
Logging	beats, eventlog, gelf, log4j, relp, syslog, varnish log
Platforms	drupal_dblog, gemfire, heroku, sqs, s3, twitter
Local	exec, generator, file, stdin, pipe, unix
Protocol	imap, irc, stomp, tcp, udp, websocket, wmi, xmpp

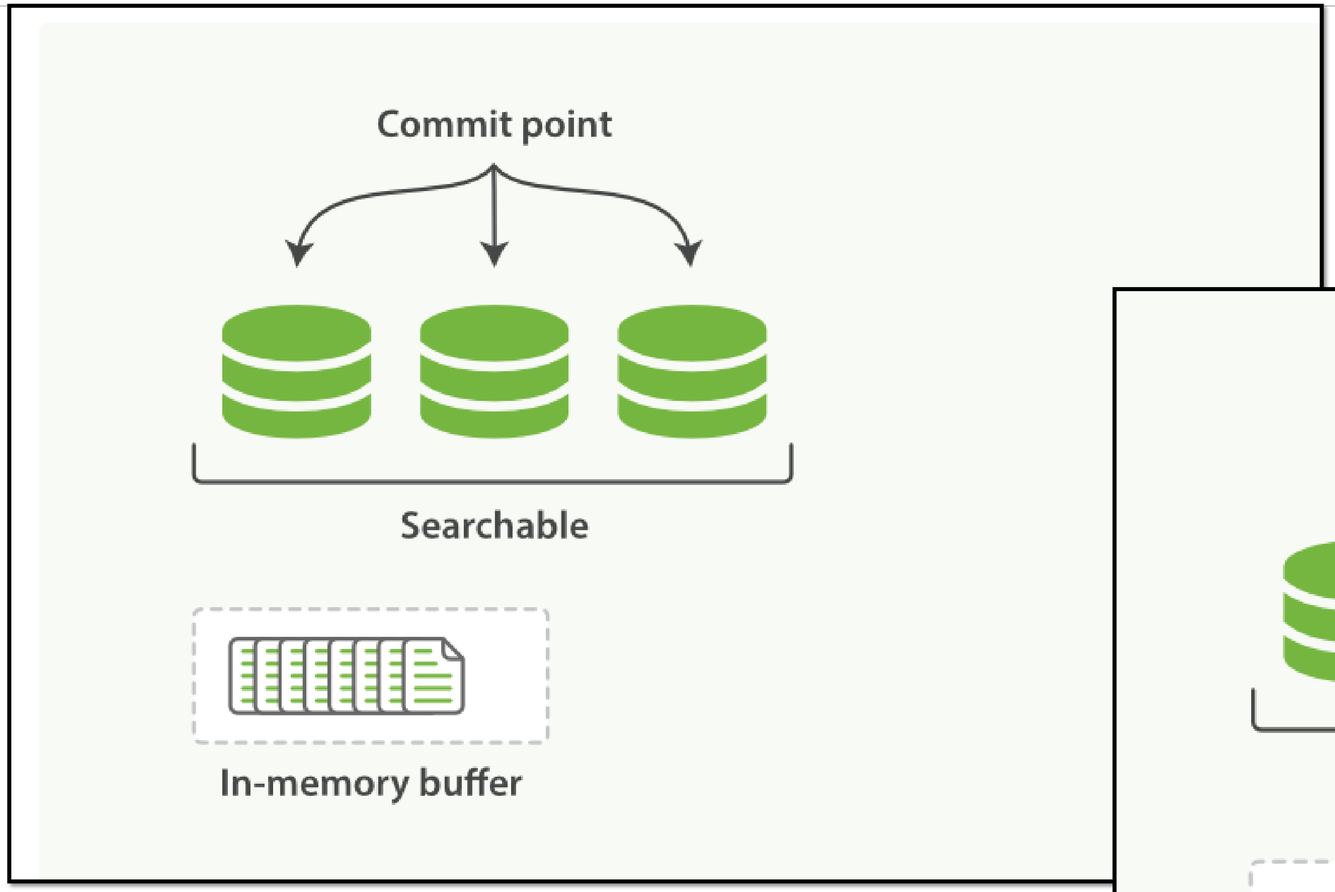
Logstash : Filters

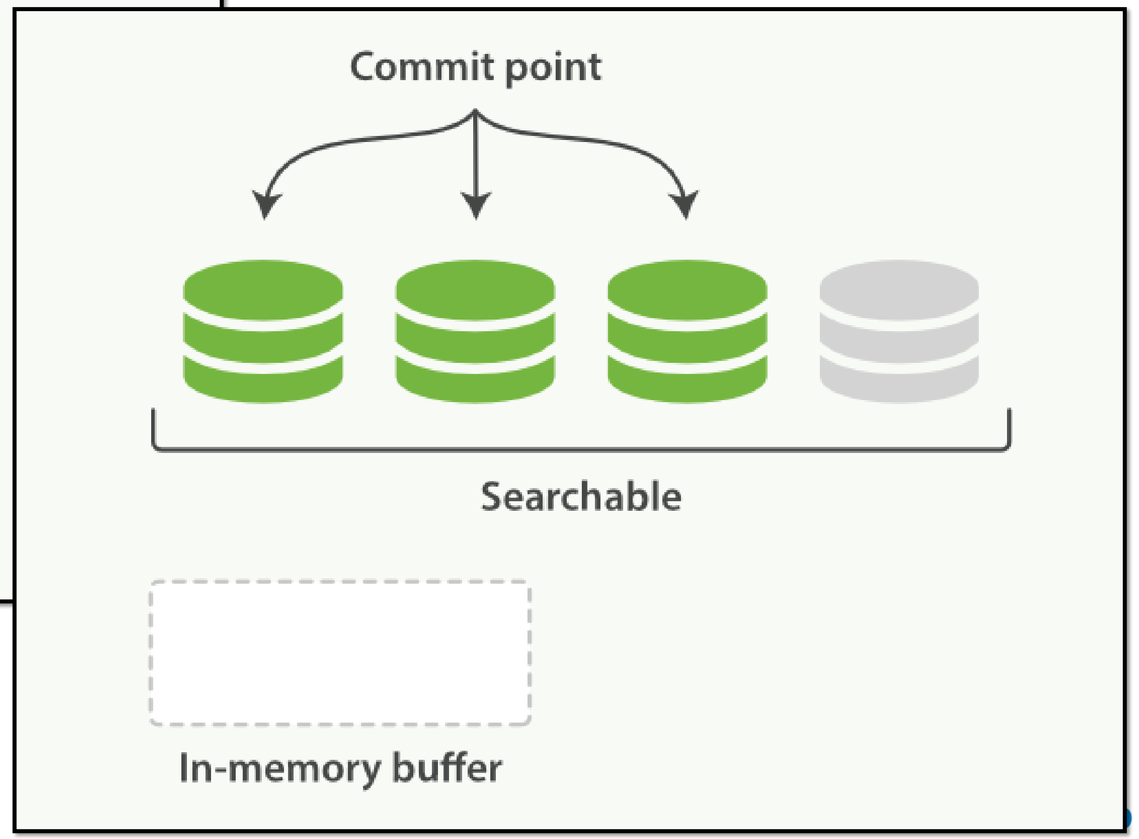
aggregate alter anonymize collate csv
cidr clone cipher checksum date dns
drop elasticsearch extractnumbers
environment elapsed fingerprint geoip
grok i18n json json_encode kv mutate
metrics multiline metaevent prune punct
ruby range syslog_pri sleep split throttle
translate uuid urldecode useragent xml

Logstash : Output

Store	elasticsearch, gemfire, mongodb, redis, riak, rabbitmq, solr
Monitoring	ganglia, graphite, graphtastic, nagios, opentsdb, statsd, zabbix
Notification	email, hipchat, irc, pagerduty, sns
Protocol	gelf, http, lumberjack, metriccatcher, stomp, tcp, udp, websocket, xmpp
External service	google big query, google cloud storage, jira, loggly, riemann, s3, sqs, syslog, datadog
External monitoring	boundary, circonus, cloudwatch, librato
Local	csv, dots, exec, file, pipe, stdout, null

Elastic Search





Kibana


kibana
Search... (e.g. status:200 AND extension:PHP)
Uses lucene
Add a filter +
Discover
Visualize
Dashboard
Timelion
Machine Learning
Graph
Dev Tools
Monitoring
Management
Guest User
Logout
Collapse
Apache - Total Visitors
11,979,137
Apache - Unique Visitors
128,088
Unique Visitors
Apache - Bytes and Count
United States China France Germany India
Count
@timestamp per hour
Apache - Country and Status
Apache - Unique Visitors by C...
City
Unique Visitors
Beijing 243,706
Woodbridge 134,791
Seattle 123,545
Seoul 111,663
Mumbai 109,801
Tokyo 106,182
New York 102,947
Apache - Country traffic by hour
Country
Hour of Day
Apache - Top OS
BlackBerry OS
Windows 7
FreeBSD
Windows 8
Mac OS X
Android
Linux
iOS
Windows
Ubuntu
Windows 2000
Windows XP
Apache - Visitor Map (geocentroid)
Calgary

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- https://www.battery.com/powered/bigpanda-analyzing-the-monitoringscape/