

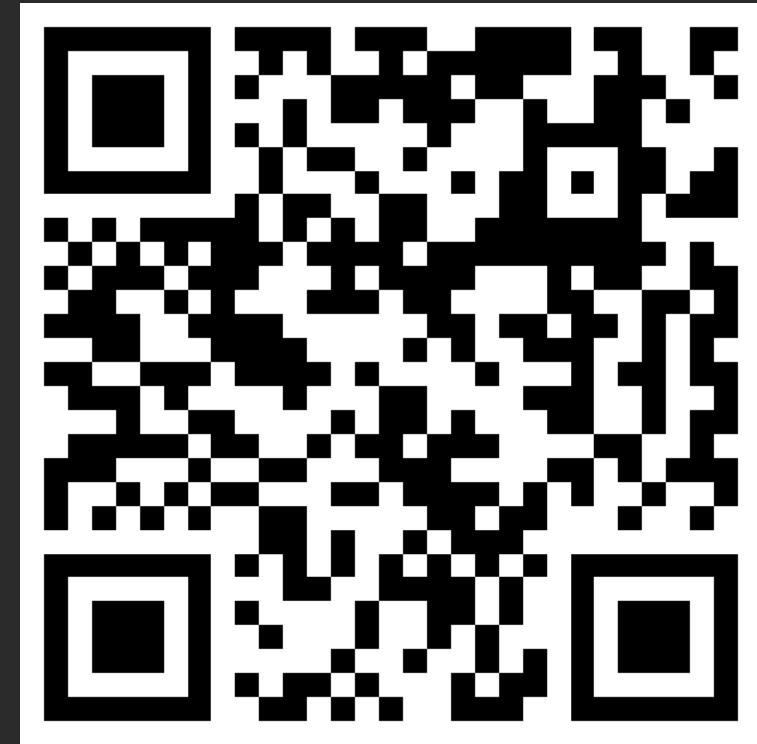
Lessons learned observing in Microservices

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SoftLeader RD



<https://github.com/shihyuho>

Microservices!



Move from Spring Cloud to Kubernetes native!



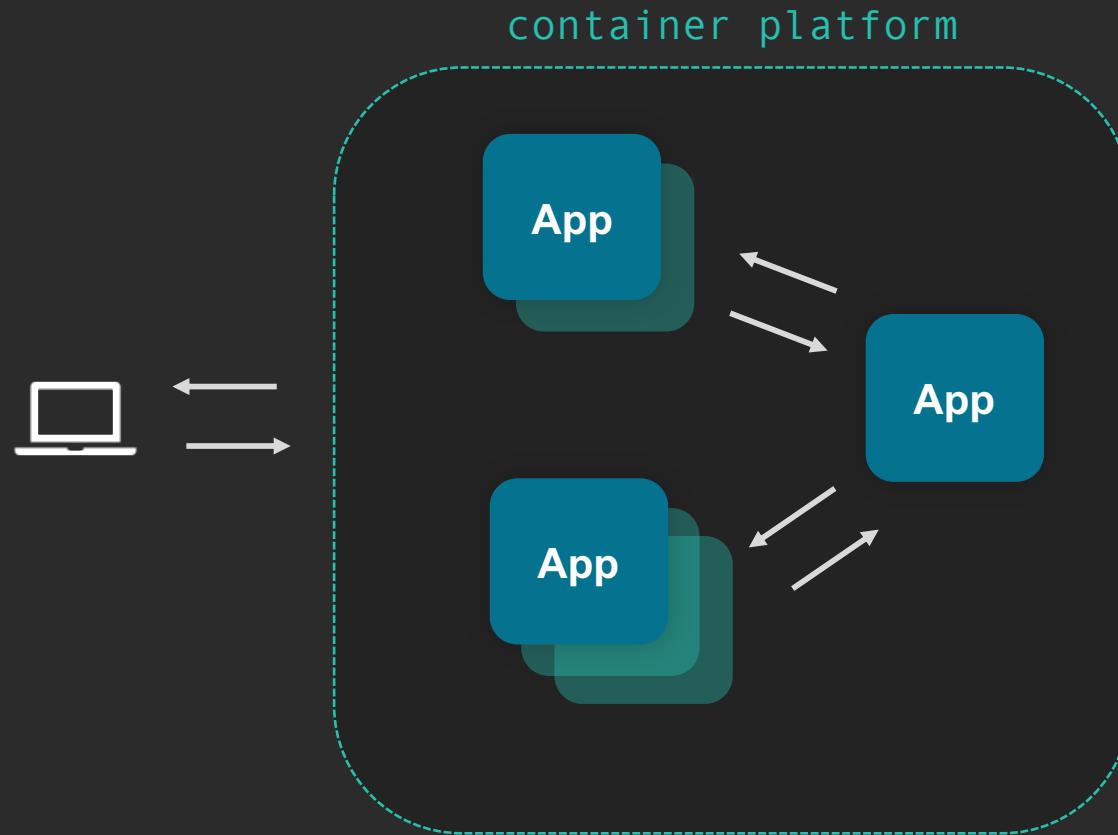
好多 App, 平常沒事, But...



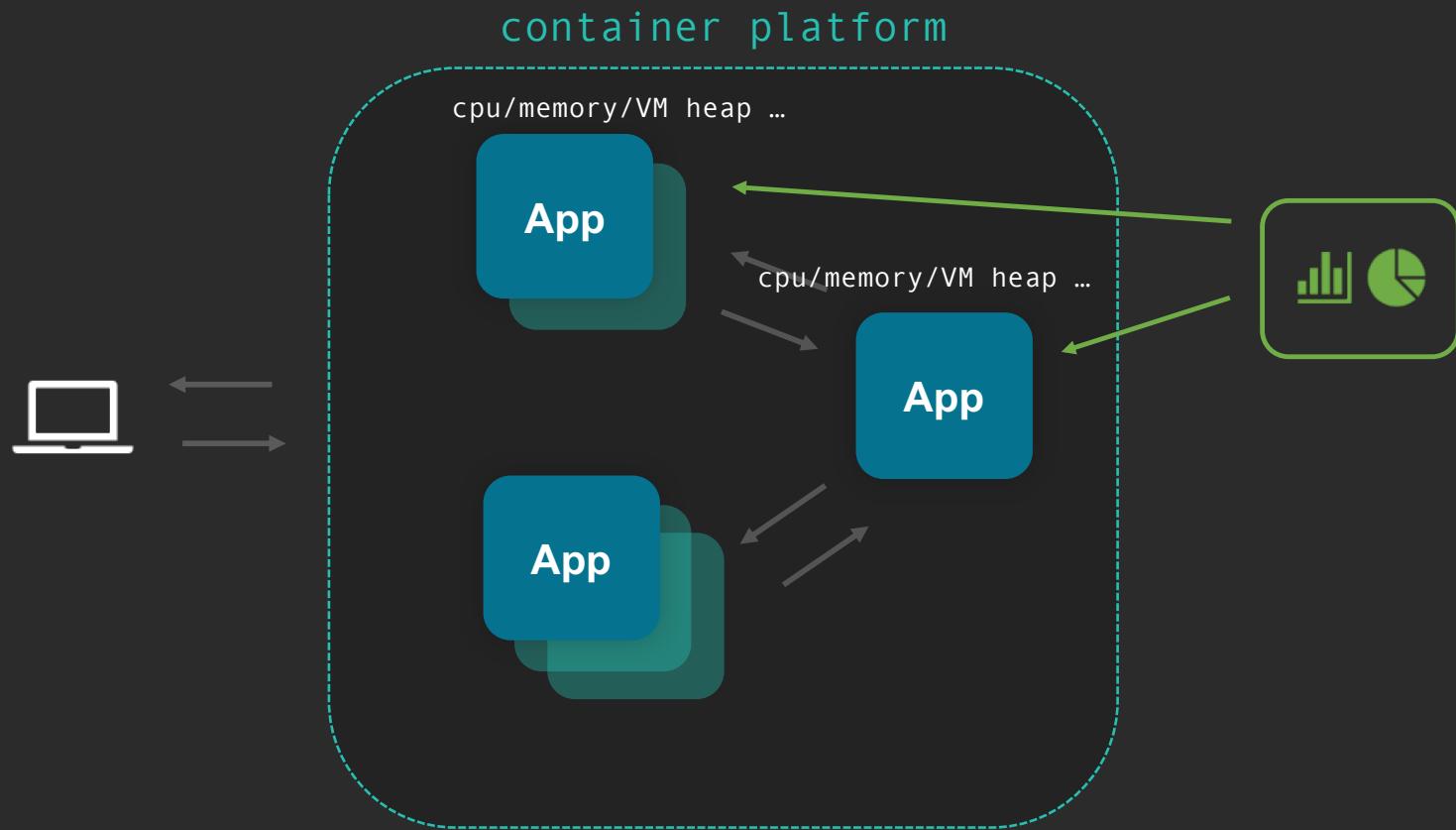
0 Infrastructure



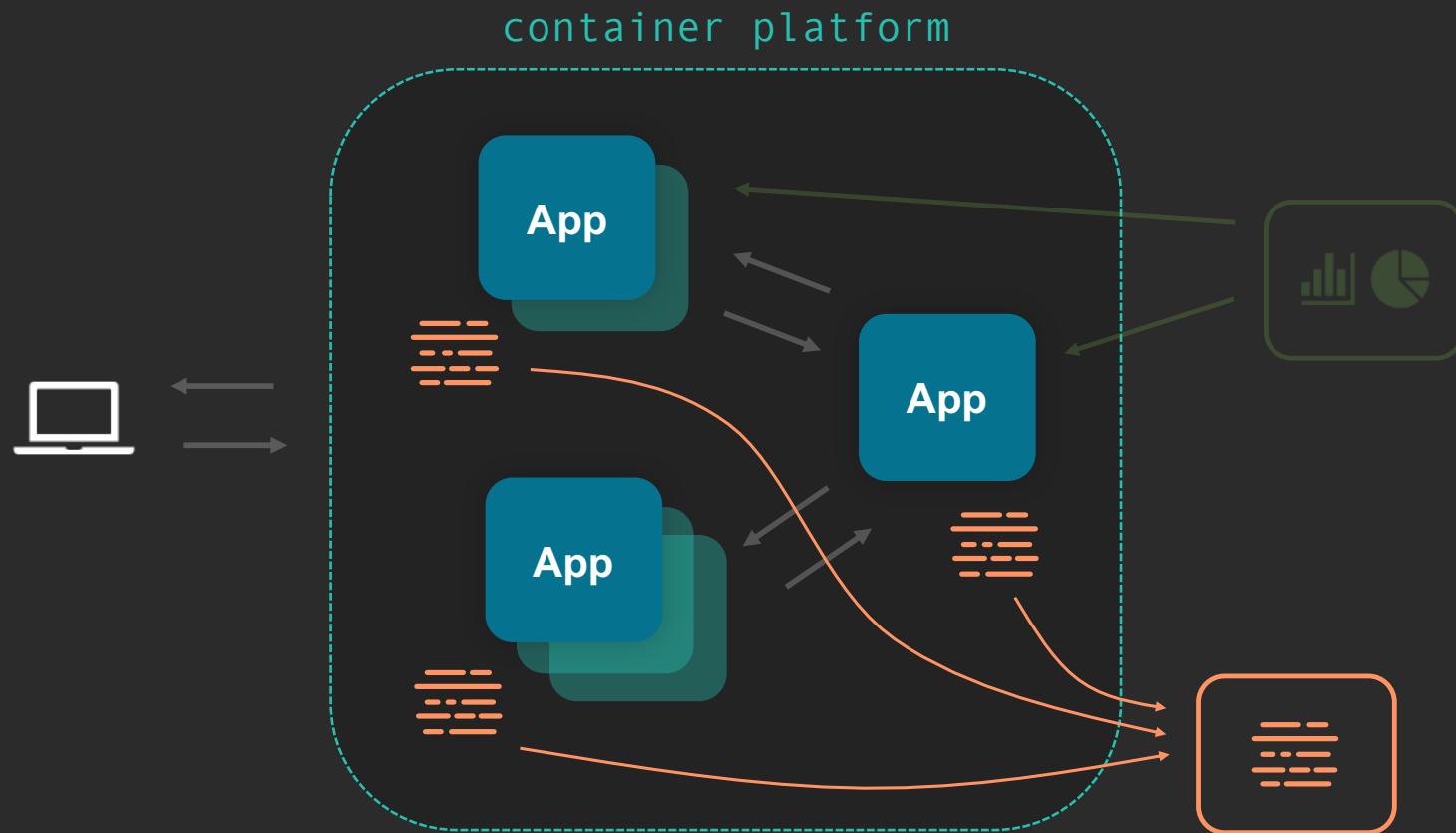
Tracing



Monitoring



Logging



Kubernetes on-premises

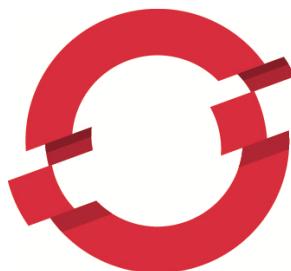


原生的，一裝好什麼都沒有！



kubernetes

不能客製呦!



Red Hat

OpenShift

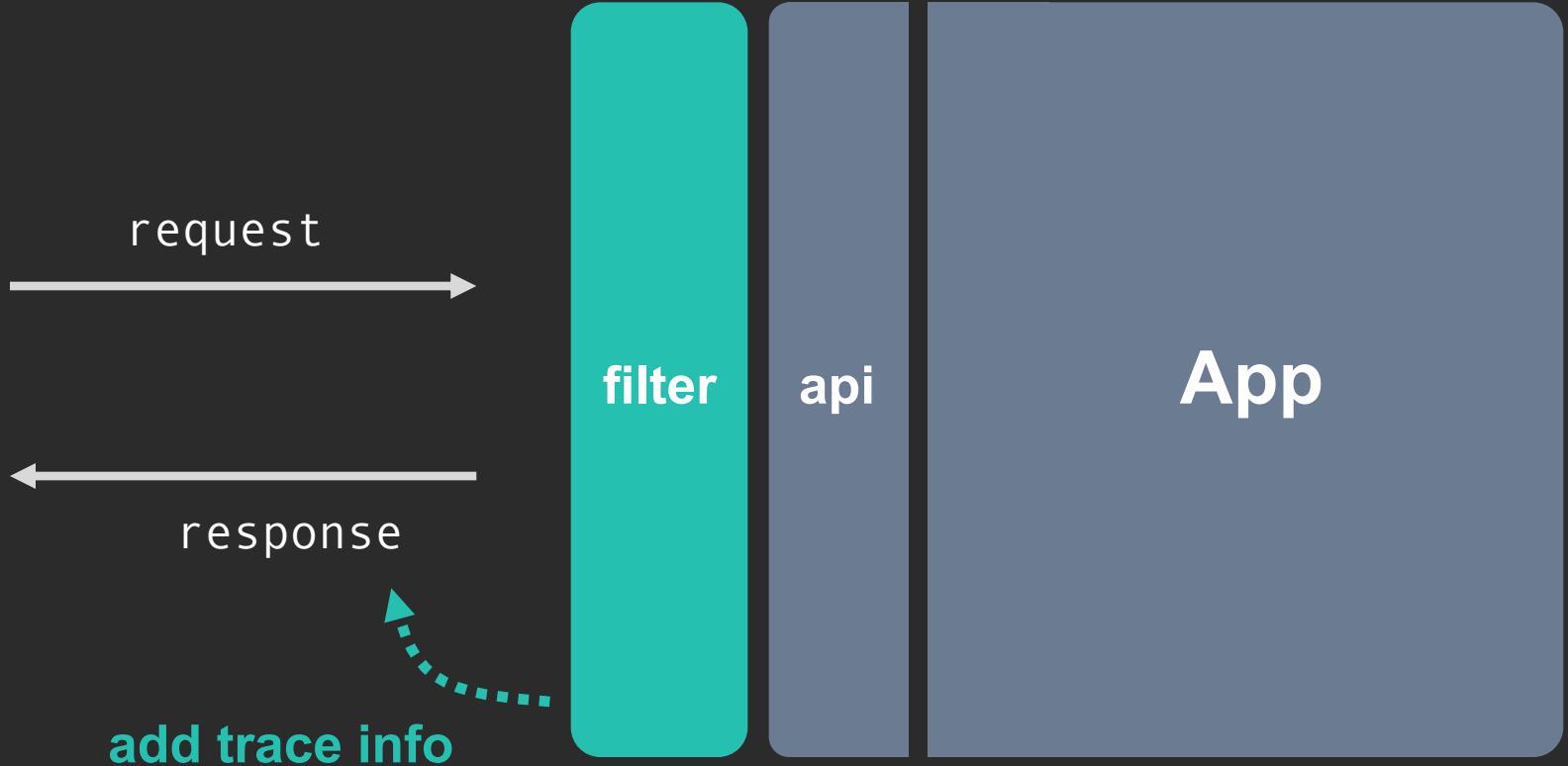
1 Tracing .^

Using OpenTracing

[github.com/opentracing-contrib/
java-spring-cloud](https://github.com/opentracing-contrib/java-spring-cloud)

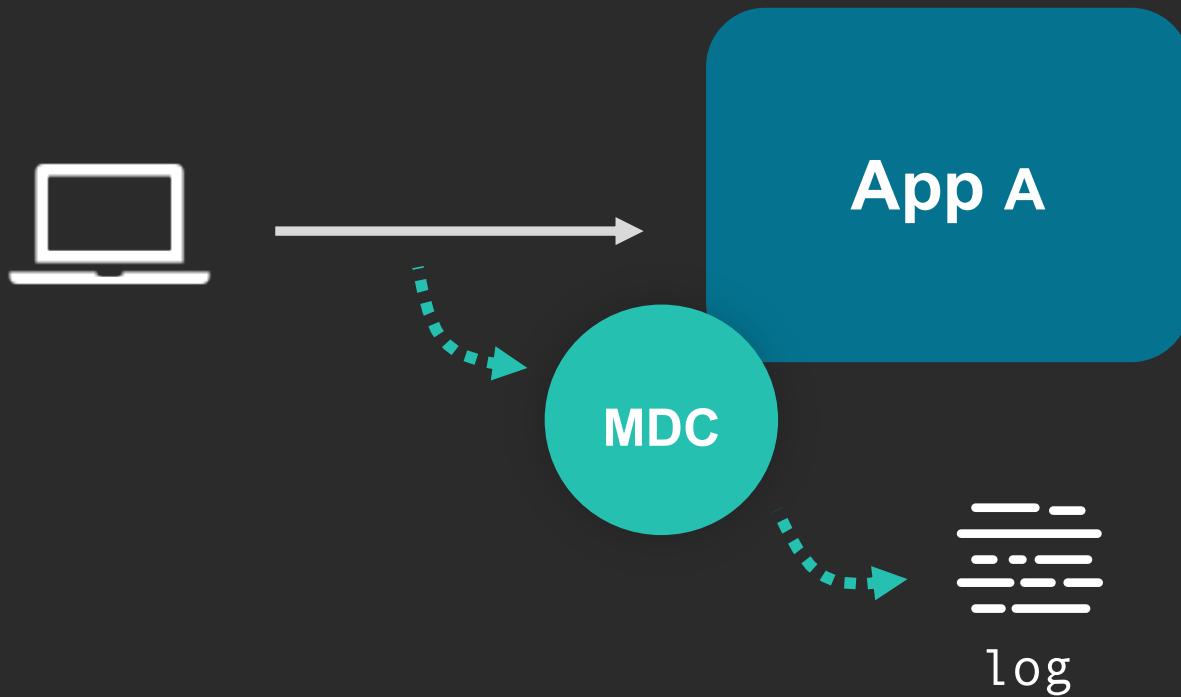


Put tracing in response



Add tracing in logger MDC

Sample code



The screenshot shows the Network tab in Chrome DevTools. The left sidebar lists requests by name, including "10501" and "10401". The main pane displays the response for the "10501" request, which originated from softleader.com.tw. The Headers section is selected, showing the following response headers:

- Server: nginx
- Transfer-Encoding: chunked
- Vary: Origin
- Vary: Access-Control-Request-Method
- Vary: Access-Control-Request-Headers
- X-Content-Type-Options: nosniff
- X-Frame-Options: DENY
- X-ROSE-REQUEST-ID: f457c94d638f49a4**
- X-XSS-Protection: 1; mode=block

At the bottom of the Headers section, there is a "Request Headers" link.

Filter: Hide data URLs All XHR JS CSS Img Media Font Doc WS Manifest Other
Preserve log Disable cache Online

Name	Headers	Preview	Response	Initiator	Timing	Cookies
10501	Server: nginx					
10501	Transfer-Encoding: chunked					
10501	Vary: Origin					
10501	Vary: Access-Control-Request-Method					
10501	Vary: Access-Control-Request-Headers					
10501	X-Content-Type-Options: nosniff					
10501	X-Frame-Options: DENY					
10501	X-ROSE-REQUEST-ID: f457c94d638f49a4					
10501	X-XSS-Protection: 1; mode=block					
10401	Request Headers	view source				

47 / 58 requests | 42.6 kB / 63.5 kB transferred | 83.2 kB / 152 kB resources

The screenshot shows the fluent UI Discover interface. At the top, there's a toolbar with 'Discover' and other navigation options. Below it is a search bar with a dropdown and a 'Search' button. A filter bar displays a single filter: 'traceld: 6448da2c2d8668d2' with a delete icon and a '+ Add filter' button. A modal window titled 'EDIT FILTER' is open, containing fields for 'Field' (set to 'traceld'), 'Operator' (set to 'is'), 'Value' (containing 'f457c94d638f49a4'), and a 'Create custom label?' checkbox. At the bottom of the modal are 'Cancel' and 'Save' buttons.

D Discover

New Save Open Share Inspect

Search

+ Add filter

traceld: 6448da2c2d8668d2

fluent EDIT FILTER Edit as Query DSL

Field Operator

traceld is

Value

f457c94d638f49a4

Create custom label?

Cancel Save

K D Discover

New Save Open Share Inspect

Search traceld: f457c94d638f49a4 × + Add filter

Count

150
100
50
0

16:35:00 16:36:00

EDIT FILTER Edit as Query DSL

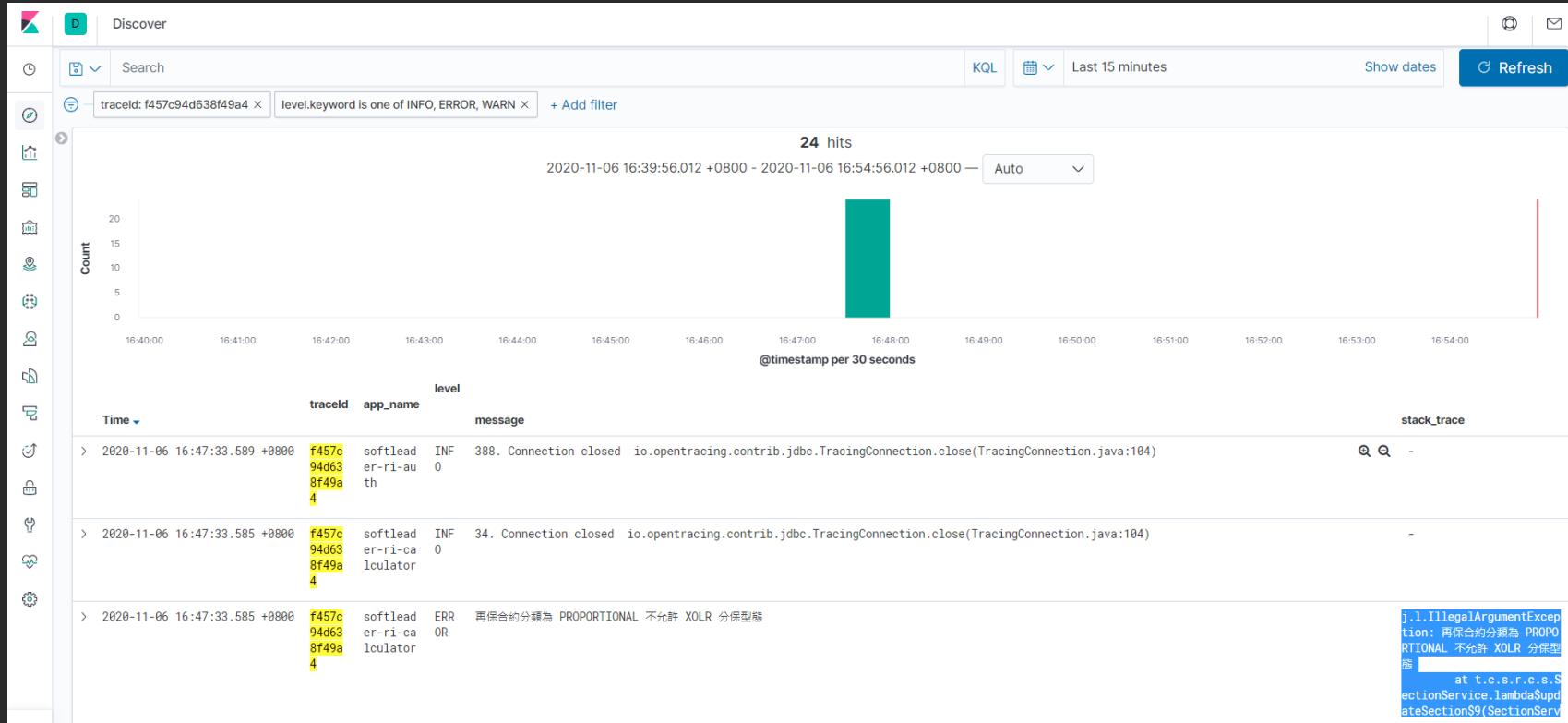
Field: level.keyword Operator: is one of

Values: INFO X, ERROR X, WARN X

Create custom label?

Cancel Save

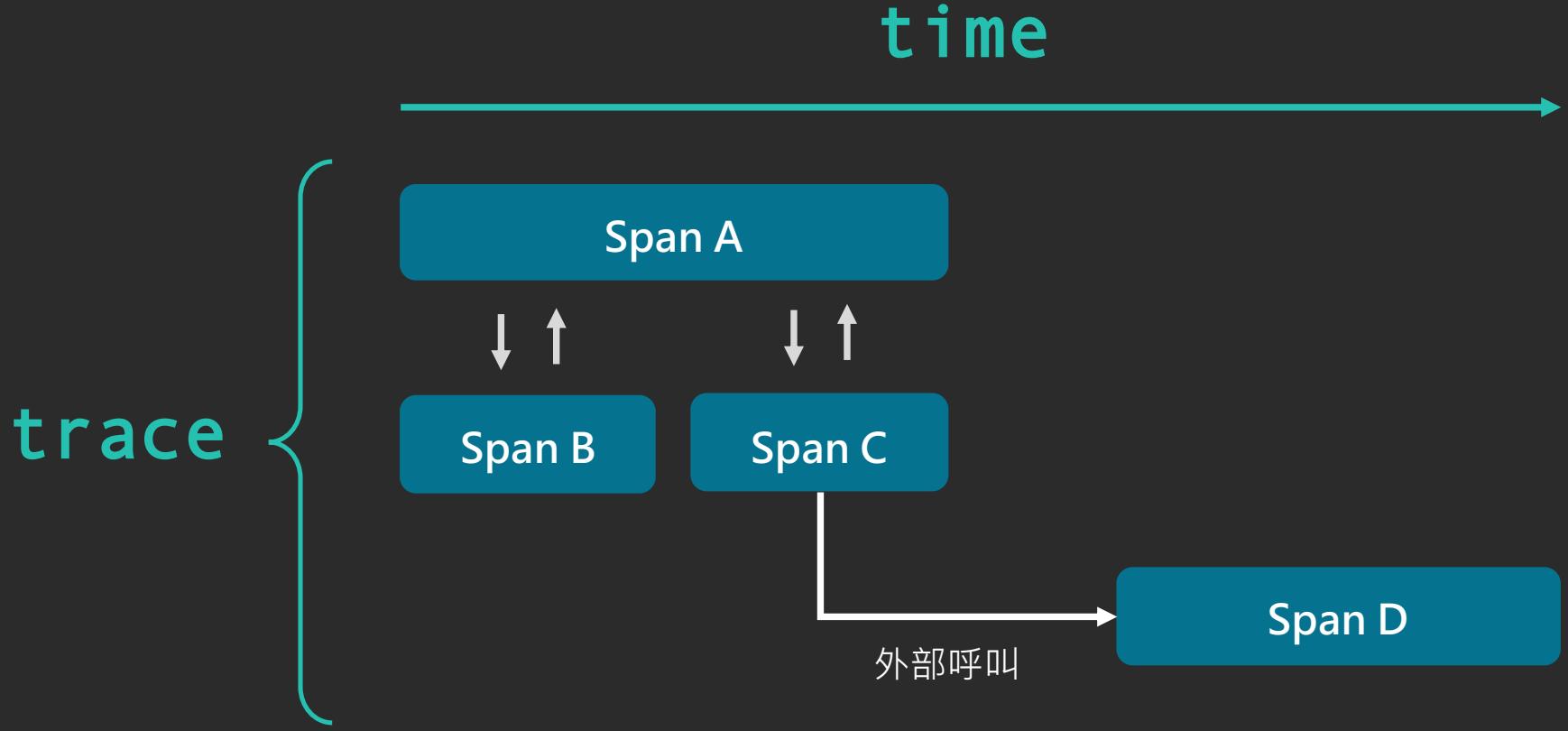
The screenshot shows the Elasticsearch Discover interface. On the left, there's a sidebar with various icons. The main area has a histogram with 'Count' on the y-axis (0 to 150) and time on the x-axis (16:35:00 to 16:36:00). A search bar at the top contains 'traceld: f457c94d638f49a4'. Below it is a '+ Add filter' button. A modal window titled 'EDIT FILTER' is open, containing fields for 'Field' (set to 'level.keyword') and 'Operator' (set to 'is one of'), and a list of values ('INFO X', 'ERROR X', 'WARN X'). At the bottom of the modal are 'Cancel' and 'Save' buttons. The overall theme is light blue and white.



🔍 ⏷ ⏸ t stack_trace

```
j.l.IllegalArgumentException: 再保合約分類為 PROPORTIONAL 不允許 XOLR 分保型態
at t.c.s.r.c.s.SectionService.lambda$updateSection$9(SectionService.java:271)
at java.util.Optional.flatMap(Optional.java:294)
at t.c.s.r.c.s.SectionService.updateSection(SectionService.java:265)
at t.c.s.r.c.s.SectionService$$FastClassBySpringCGLIB$$fe80e155.invoke(<generated>)
at o.s.c.p.MethodProxy.invoke(MethodProxy.java:218)
at o.s.a.f.CglibAopProxy$CglibMethodInvocation.invokeJoinpoint(CglibAopProxy.java:771)
at o.s.a.f.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:163)
at o.s.a.f.CglibAopProxy$CglibMethodInvocation.proceed(CglibAopProxy.java:749)
at o.s.v.b.MethodValidationInterceptor.invoke(MethodValidationInterceptor.java:119)
at o.s.a.f.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:186)
at o.s.a.f.CglibAopProxy$CglibMethodInvocation.proceed(CglibAopProxy.java:749)
at o.s.a.a.MethodInvocationProceedingJoinPoint.proceed(MethodInvocationProceedingJoinPoint.java:88)
at t.c.s.r.l.GlobalLoggingAspect.aroundAdvice(GlobalLoggingAspect.java:78)
at j.i.r.GeneratedMethodAccessor161.invoke(Unknown Source)
at j.i.r.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
at j.l.reflect.Method.invoke(Method.java:566)
at o.s.a.a.AbstractAspectJAdvice.invokeAdviceMethodWithGivenArgs(AbstractAspectJAdvice.java:644)
at o.s.a.a.AbstractAspectJAdvice.invokeAdviceMethod(AbstractAspectJAdvice.java:633)
at o.s.a.a.AspectJAroundAdvice.invoke(AspectJAroundAdvice.java:70)
at o.s.a.f.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:186)
at o.s.a.f.CglibAopProxy$CglibMethodInvocation.proceed(CglibAopProxy.java:749)
at o.s.t.i.TransactionAspectSupport.invokeWithinTransaction(TransactionAspectSupport.java:367)
at o.s.t.i.TransactionInterceptor.invoke(TransactionInterceptor.java:118)
at o.s.a.f.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:186)
at o.s.a.f.CglibAopProxy$CglibMethodInvocation.proceed(CglibAopProxy.java:749)
at o.s.a.i.ExposeInvocationInterceptor.invoke(ExposeInvocationInterceptor.java:95)
at o.s.a.f.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:186)
at o.s.a.f.CglibAopProxy$CglibMethodInvocation.proceed(CglibAopProxy.java:749)
at o.s.a.f.CglibAopProxy$DynamicAdvisedInterceptor.intercept(CglibAopProxy.java:691)
at t.c.s.r.c.s.SectionService$$EnhancerBySpringCGLIB$$ee2ba641.updateSection(<generated>)
... 141 frames truncated
```

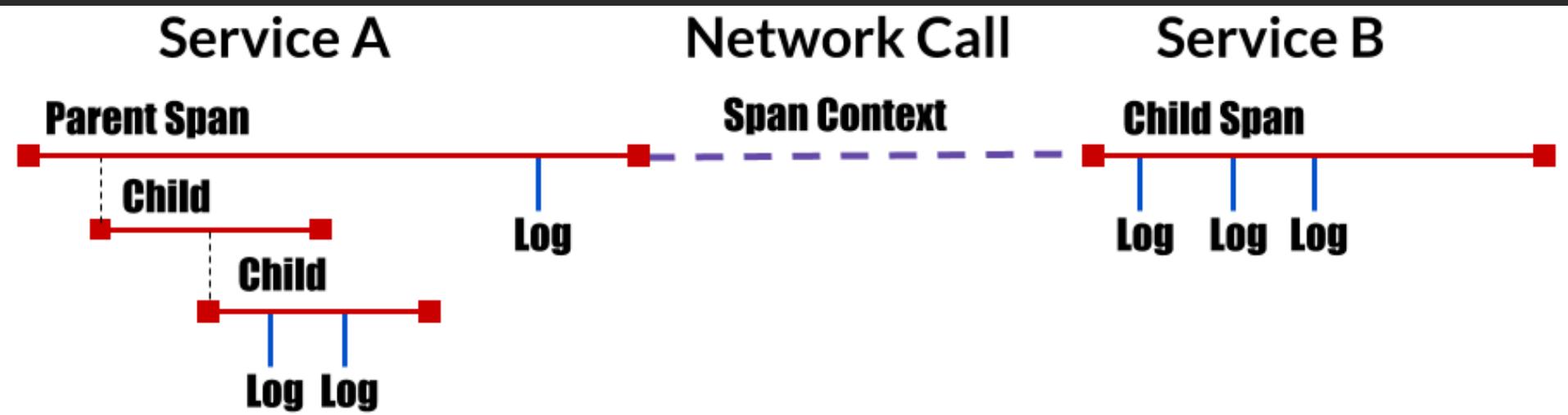
Create your Spans

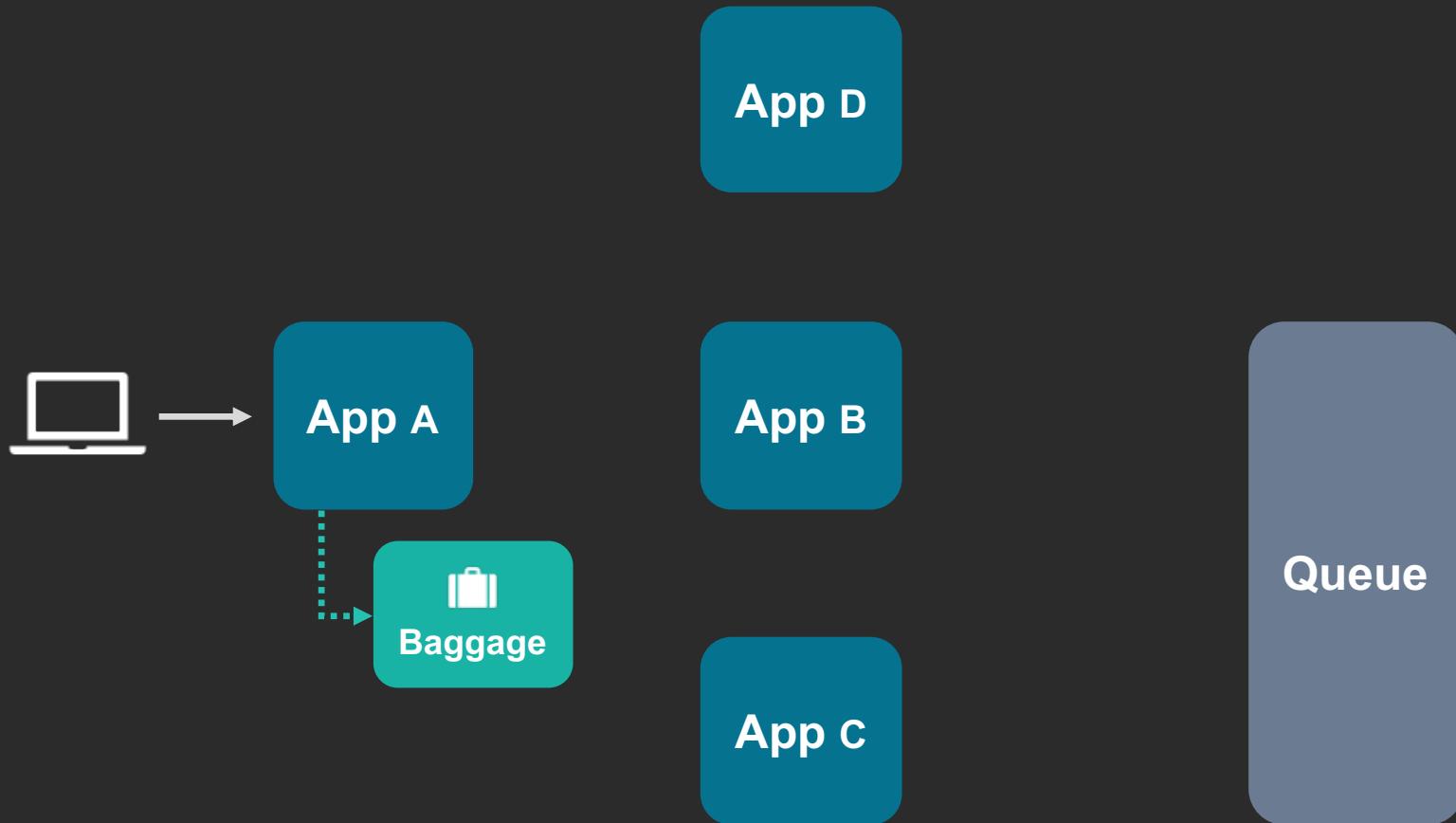


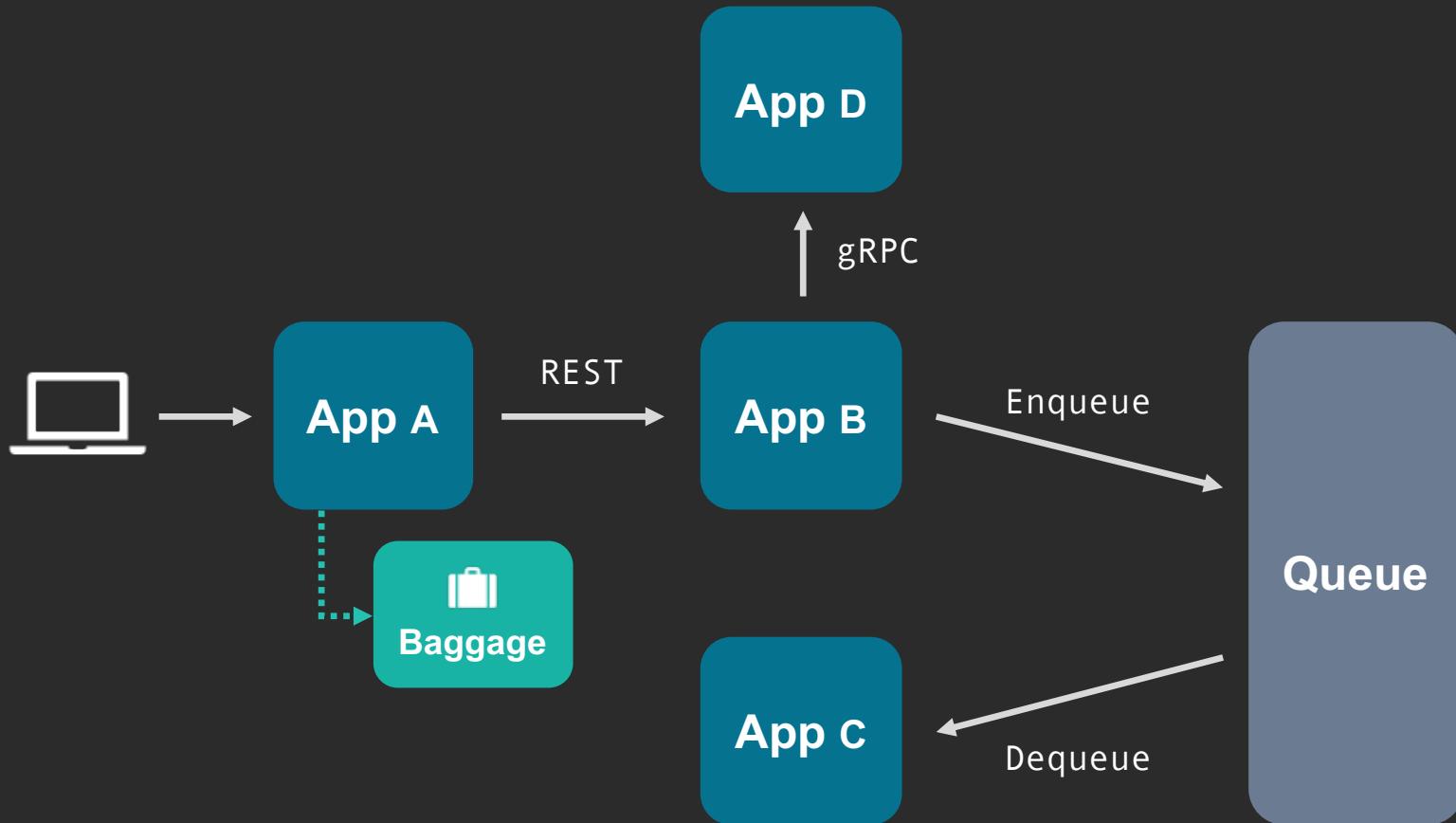


```
var tracer = io.opentracing.util.GlobalTracer.get()
var mySpan = tracer.buildSpan("my-span").start();
tracer.activateSpan(mySpan);
```

Propagating messages









```
var span = io.opentracing.util.GlobalTracer.get().activeSpan();
var systemId = span.getBaggageItem("system-id");
span.setBaggageItem("system-id", systemId);
```

2 Monitoring



Prometheus & exporters

環境類 exporters

- **node-exporter** - Hardware/OS metrics
- **cAdvisor** - Container metrics
- **kube-state-metrics** - Kubernetes Object metrics

**github.com/prometheus-operator/
kube-prometheus**





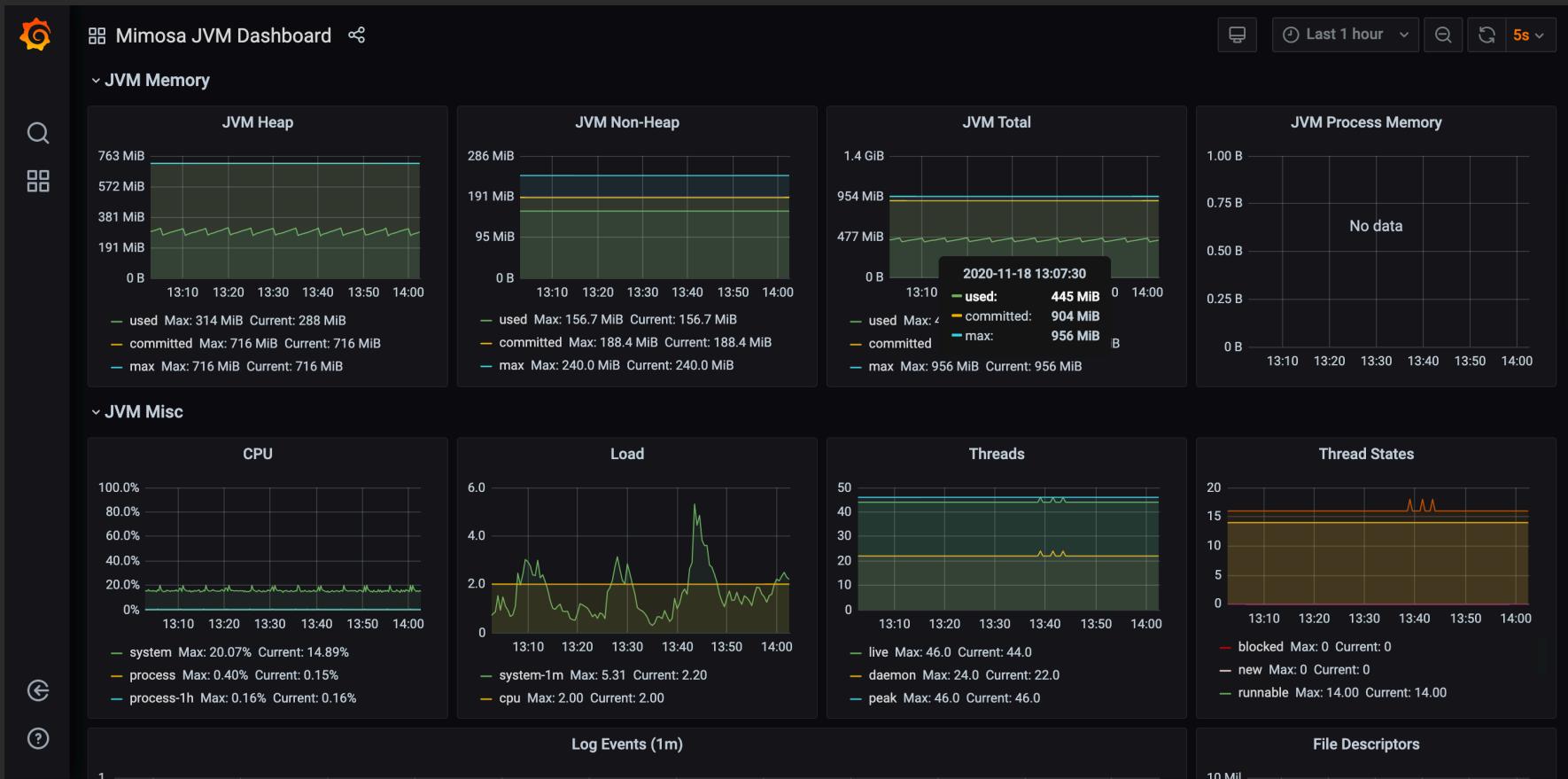




服務類 exporters

- **blackbox** - Probing over HTTP, HTTPS, DNS...
- **micrometer.io** - Java app metrics





[https://grafana.com/grafana/
dashboards](https://grafana.com/grafana/dashboards)



3 Logging

.io

JSON logging format

**github.com/logstash/
logstash-logback-encoder**



Append app information

app_name, app_version...

```
<springProperty scope="context" name="appName" source="info.application.name"/>
<springProperty scope="context" name="appVersion" source="info.application.version"/>

<appender name="jsonout" class="ch.qos.logback.core.ConsoleAppender">
    <encoder class="net.logstash.logback.encoder.LoggingEventCompositeJsonEncoder">
        <providers>
            <mdc/>
            <timestamper>
                <timeZone>Asia/Taipei</timeZone>
            </timestamper>
            <logLevel/>
            <threadName/>
            <loggerName/>
            <message/>
            <pattern>
                <pattern>
                    {
                        "app_name": "${appName:-}",
                        "app_version": "${appVersion:-}"
                    }
                </pattern>
            </pattern>
        </providers>
        <stackTrace>
            <throwableConverter class="net.logstash.logback.stacktrace.ShortenedThrowableConverter">
                <maxDepthPerThrowable>30</maxDepthPerThrowable>
                <maxLength>10240</maxLength> <!-- 最多帶 10k 的 stack trace, 超過應該也沒用了 -->
                <shortenedClassNameLength>20</shortenedClassNameLength>
                <rootCauseFirst>true</rootCauseFirst> <!-- 將 root cause 擺最前面, 避免超過 10k 被 trim 掉 -->
            </throwableConverter>
        </stackTrace>
    </encoder>
</appender>

<root level="warn">
    <appender-ref ref="jsonout"/>
</root>
```

	14:12:00	14:13:00	14:14:00	14:15:00	14:16:00	14:17:00	14:18:00	14:19:00	14:20:00	14:21:00	14:22:00	14:23:00	14:24:00	14:25:00	
Time	@timestamp per 30 seconds														
	app_name	app_version	short_message												
>	2020-11-18 14:24:20.676 +0800	hrbot	1.1.38	hrbot stopped in 0.052s											
>	2020-11-18 14:24:11.502 +0800	hrbot	1.1.39	Installed features: [cache, cdi, config-yaml, hibernate-validator, jaeger, logging-gelf, mutiny, rest-client, resteasy, resteasy-jsonb, scheduler, servlet, smallrye-context-propagation, smallrye-fault-tolerance, smallrye-health, smallrye-metrics, sm											
>	2020-11-18 14:24:11.500 +0800	hrbot	1.1.39	Profile prod activated.											
>	2020-11-18 14:24:11.494 +0800	hrbot	1.1.39	hrbot 1.1.39 on JVM (powered by Quarkus 1.9.2.Final) started in 3.451s. Listening on: http://0.0.0.0:8080											
>	2020-11-18 14:24:11.334 +0800	hrbot	1.1.39	Registered special softleader-email to slack-email mapping: {gary@softleader.com.tw=jakarta99@gmail.com}											
>	2020-11-18 14:23:57.296 +0800	hrbot	1.1.38	Reporting attendance for webb.peng/UAGQ2DEAE to 第一銀行 at 2020-11-18T13:40											

ES index strategy

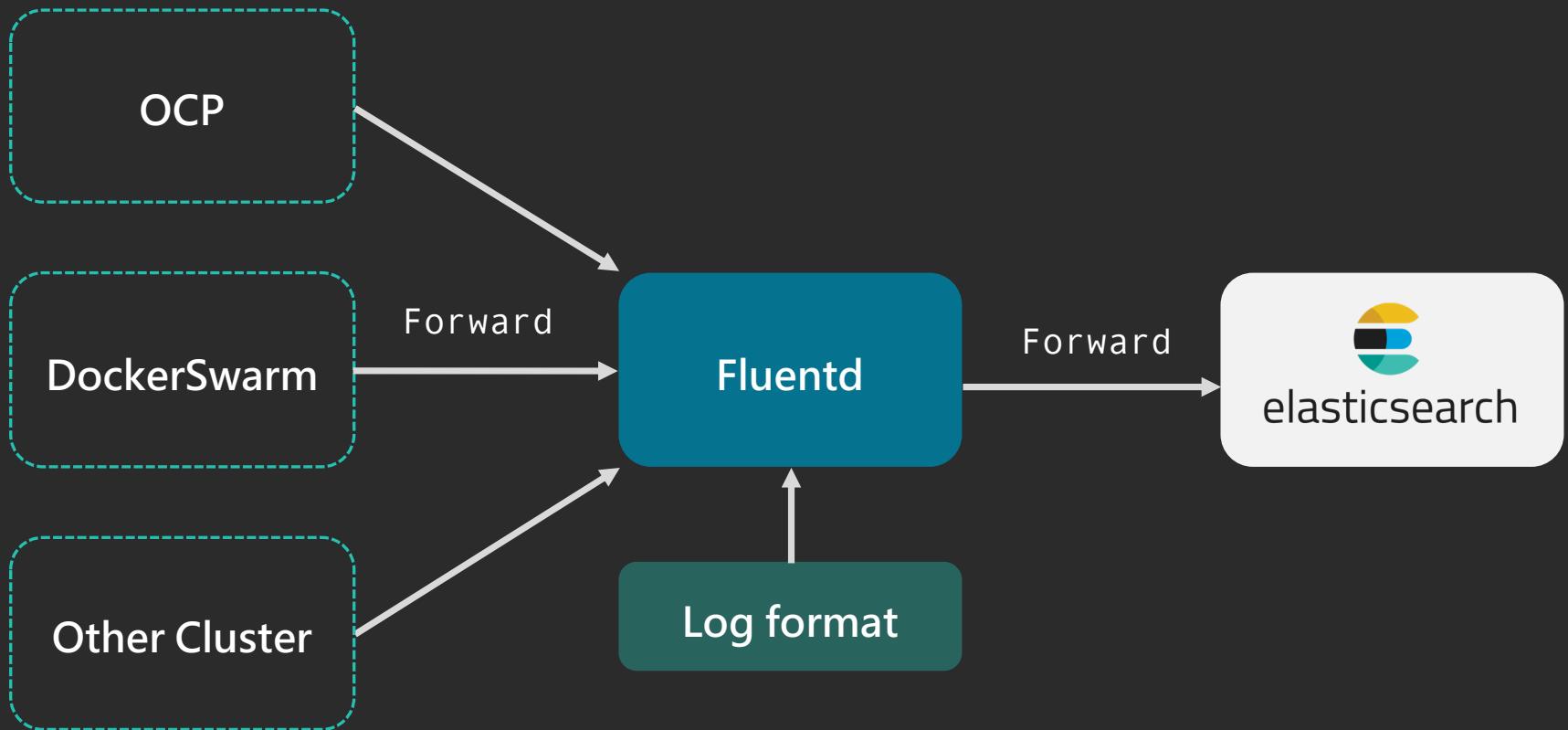
By namespace and date...

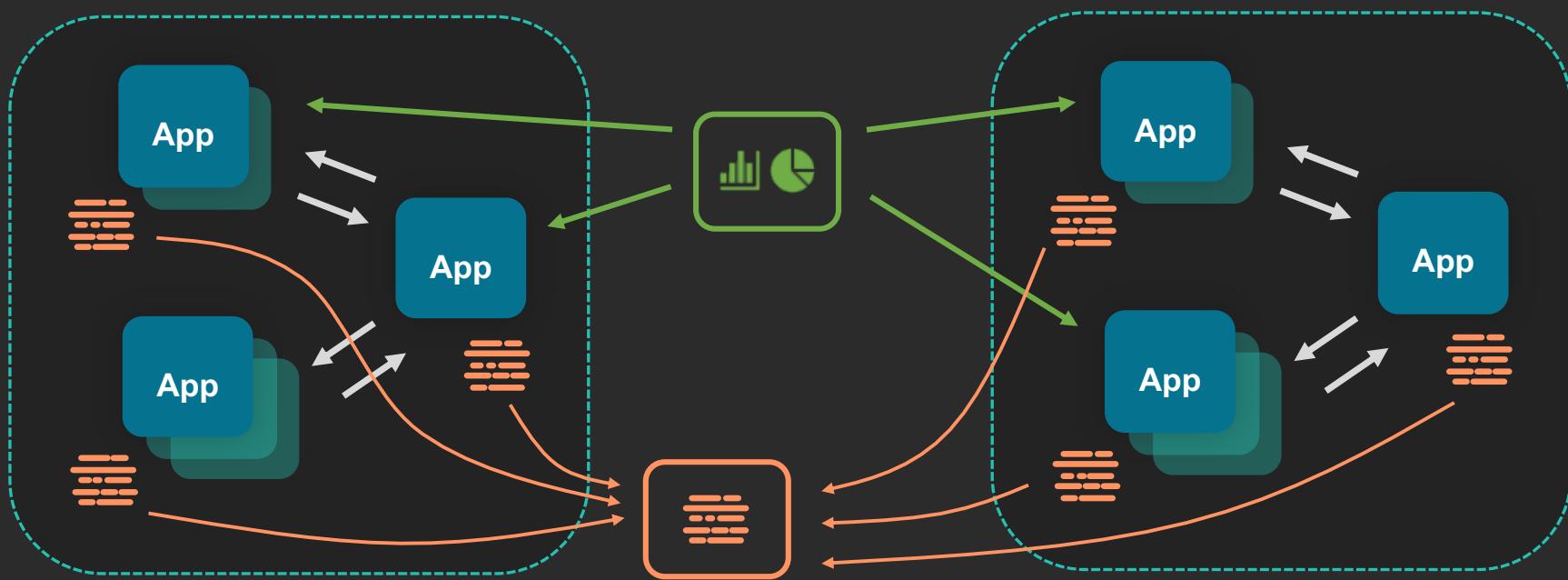
```
# Parse json field
<filter kubernetes.**>
    @id filter_parser
    @type parser
    key_name log
    reserve_data true
    hash_value_field parsed
    <parse>
        @type multi_format
        <pattern>
            format json
        </pattern>
        <pattern>
            format none
        </pattern>
    </parse>
</filter>

# Ref: https://github.com/uken/fluent-plugin-elasticsearch
<match **>
    @type elasticsearch_dynamic
    @id out_es
    @log_level info

    host "#{ENV['FLUENT_ESCALICSEARCH_HOST']}"
    port "#{ENV['FLUENT_ESCALICSEARCH_PORT']}"
    logstash_prefix "{{my-prefix}}-$record['kubernetes']['namespace_name']"
    logstash_format true
    ...
</match>
```

Forwarding logs from { ... }





好多 App, 平常沒事, But...



Thanks

