London
Microservices
User Group 2019

ATTEST

Evolution of application monitoring

@zakknill
https://zknill.io

ATTEST
Consumer Growth Platform
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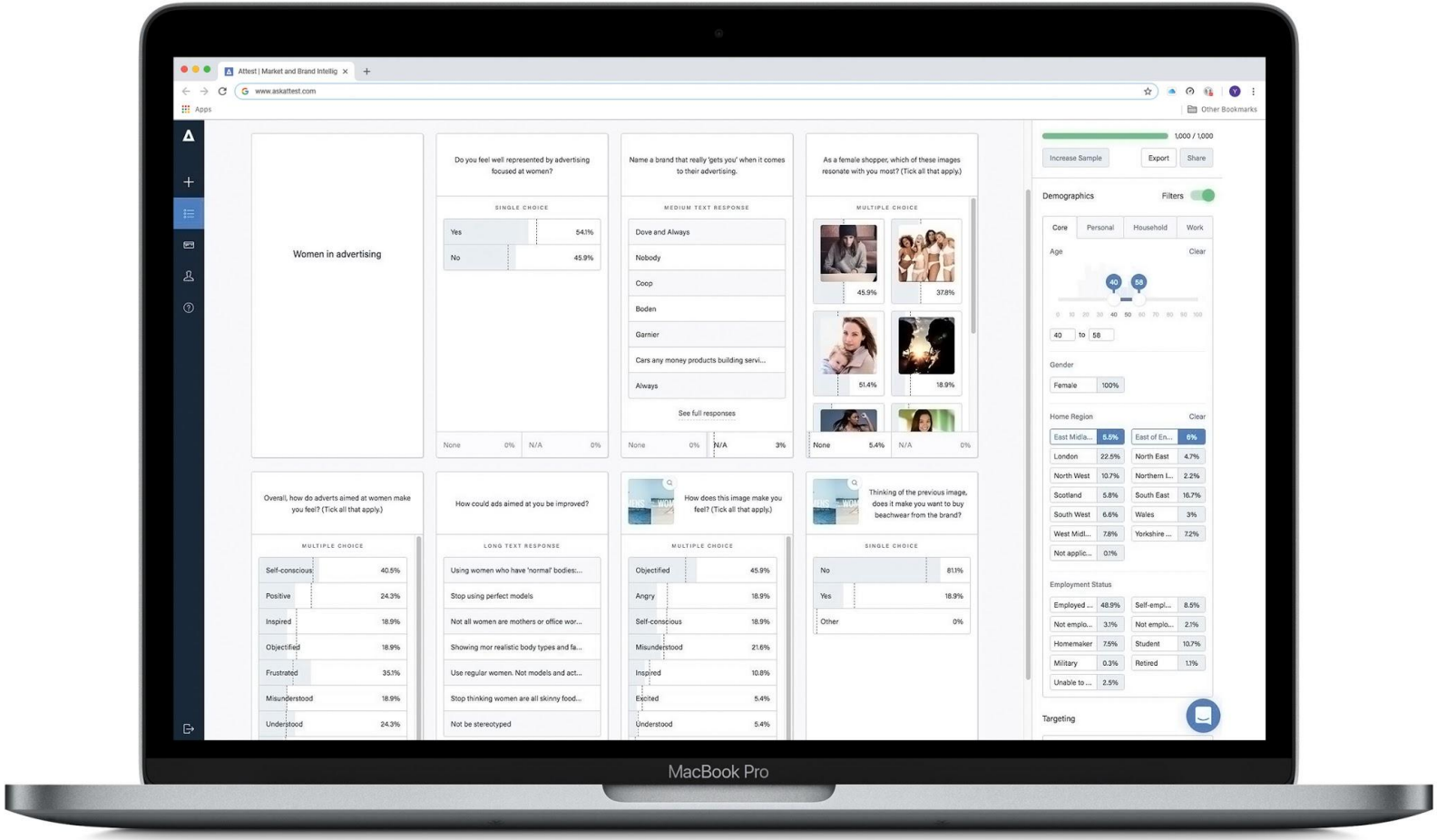
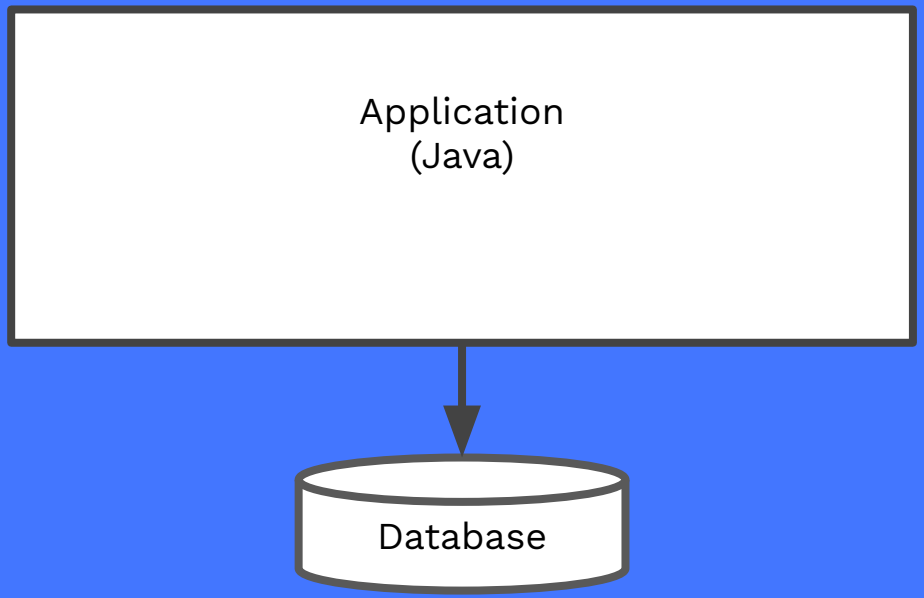

Attest | Market and Brand Intellig
www.askattest.com
Apps
Other Bookmarks
Women in advertising
Do you feel well represented by advertising focused at women?
SINGLE CHOICE
Yes 54.1%
No 45.9%
None 0% N/A 0%
Name a brand that really 'gets you' when it comes to their advertising.
MEDIUM TEXT RESPONSE
Dove and Always
Nobody
Coop
Boden
Garnier
Cars any money products building servi...
Always
See full responses
None 0% N/A 3%
As a female shopper, which of these images resonate with you most? (Tick all that apply.)
MULTIPLE CHOICE
45.9%
37.8%
51.4%
18.9%
None 5.4% N/A 0%
Overall, how do adverts aimed at women make you feel? (Tick all that apply.)
MULTIPLE CHOICE
Self-conscious 40.5%
Positive 24.3%
Inspired 18.9%
Objectified 18.9%
Frustrated 35.1%
Misunderstood 18.9%
Understood 24.3%
How could ads aimed at you be improved?
LONG TEXT RESPONSE
Using women who have 'normal' bodies:...
Stop using perfect models
Not all women are mothers or office wor...
Showing mor realistic body types and fa...
Use regular women. Not models and act...
Stop thinking women are all skinny food...
Not be stereotyped
How does this image make you feel? (Tick all that apply.)
MULTIPLE CHOICE
Objectified 45.9%
Angry 18.9%
Self-conscious 18.9%
Misunderstood 21.6%
Inspired 10.8%
Excited 5.4%
Understood 5.4%
Thinking of the previous image, does it make you want to buy beachwear from the brand?
SINGLE CHOICE
No 81.1%
Yes 18.9%
Other 0%
1,000 / 1,000
Increase Sample
Export
Share
Demographics
Filters
Core
Personal
Household
Work
Age
Clear
40
58
40 to 58
Gender
Female 100%
Home Region
Clear
East Midla... 5.5%
East of En... 6%
London 22.5%
North East 4.7%
North West 10.7%
Northern I... 2.2%
Scotland 5.8%
South East 16.7%
South West 6.6%
Wales 3%
West Midl... 7.8%
Yorkshire ... 7.2%
Not applic... 0.1%
Employment Status
Employed ... 48.9%
Self-empl... 8.5%
Not emplo... 3.1%
Not emplo... 2.1%
Homemaker 7.5%
Student 10.7%
Military 0.3%
Retired 1.1%
Unable to ... 2.5%
Targeting
MacBook Pro



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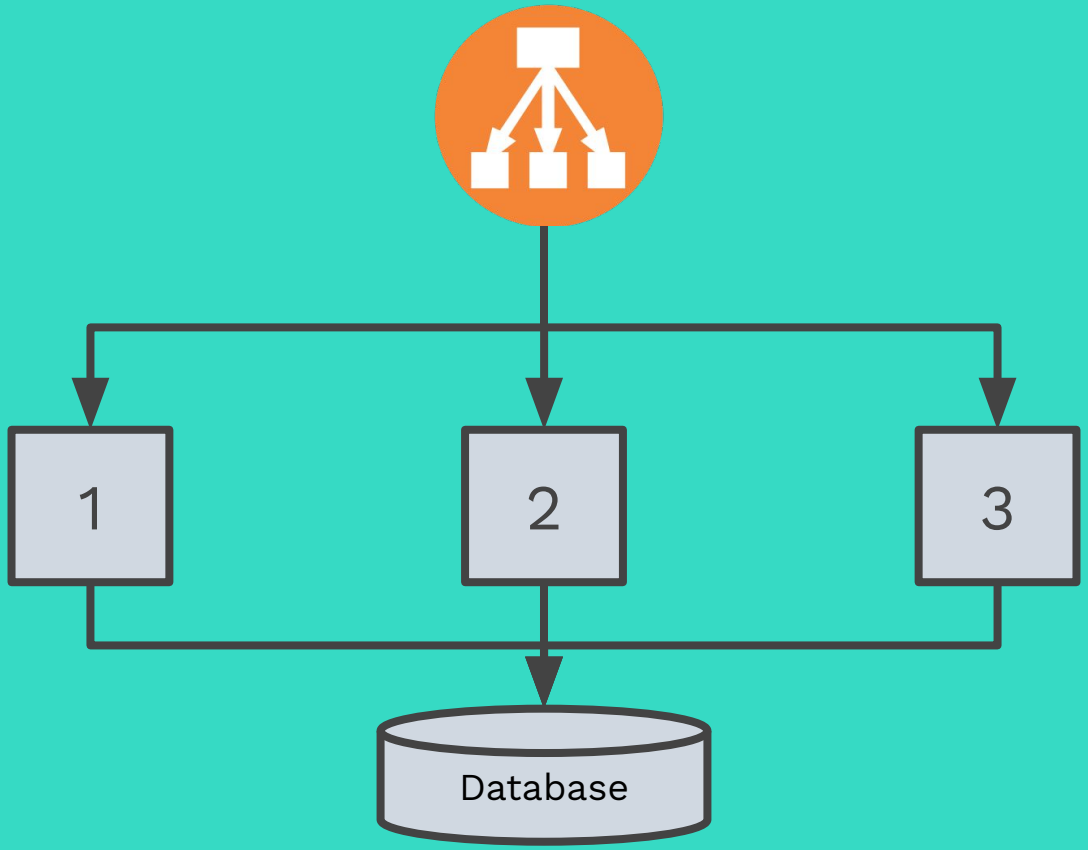
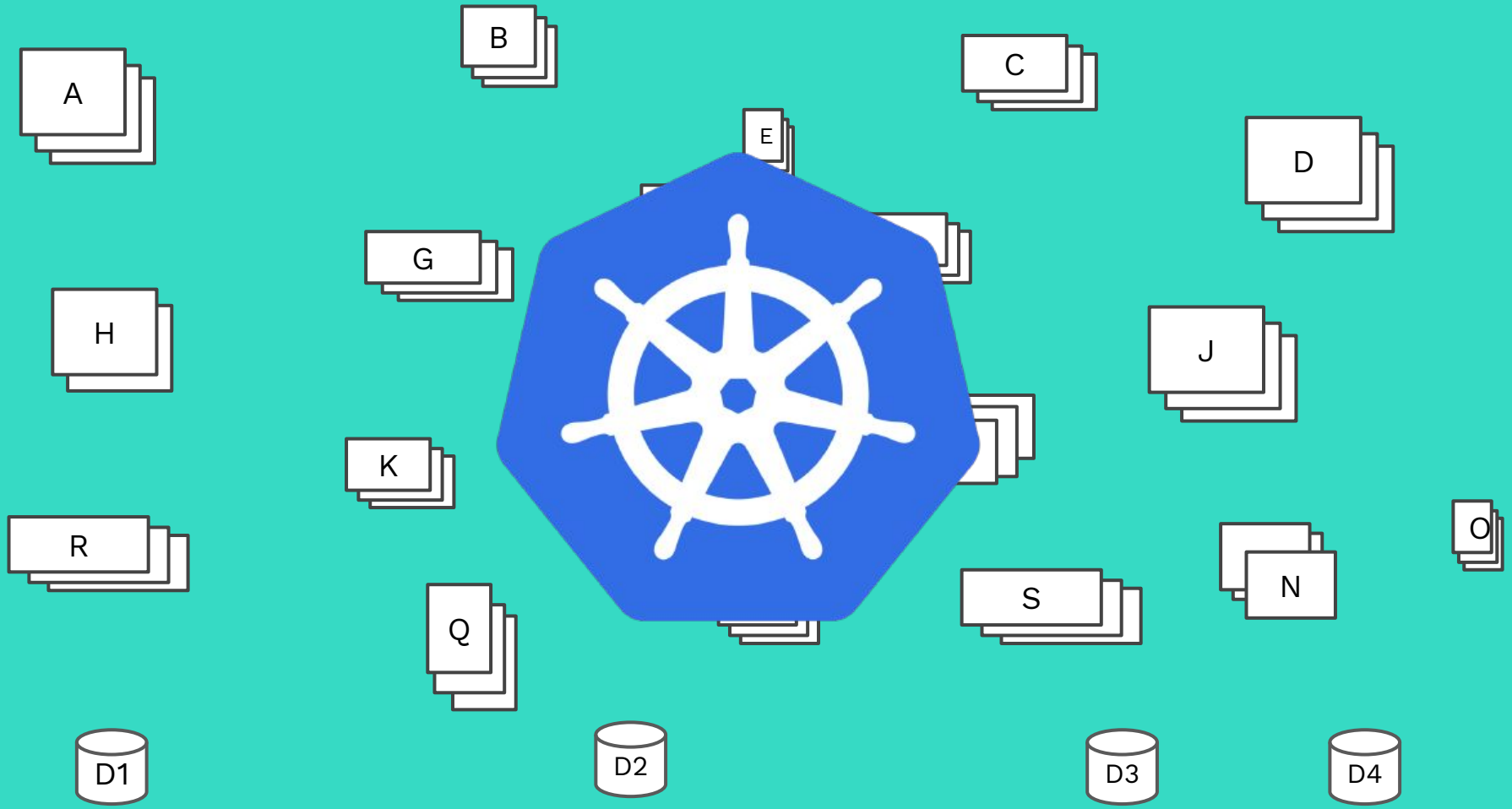

1
2
3
Database


A
B
C
D
E
G
H
J
K
R
Q
S
N
O
D1
D2
D3
D4

what vs. why

Symptom	Cause
Responses have 500 and 404 status	DB connection pool exhausted
Images aren’t loading	CDN has misconfigured ACLs
Node is unresponsive	App leaking file descriptors
Node has run out of disk space	Docker images are not pruned

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Monitoring
blackbox vs. whitebox

ATTEST

“Testing externally visible behaviour as user would see it.”

“Exposing internal stats / metrics for debugging”

ATTEST

Ansible and AMIs

StatusCake

April 2016

Docker and ECS

AWS Application Load Balancer monitoring only

July 2016

Linkerd 1

Zipkin distributed tracing

May 2017

Kubernetes

Prometheus and alertmanager

September 2018

Linkerd 2

MAOR metrics, grafana, linkerd dashboard

January 2019 - now

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BackendConnectionErrors
HealthyHostCount
HTTPCode_Backend_2XX,
HTTPCode_Backend_3XX,
HTTPCode_Backend_4XX,
HTTPCode_Backend_5XX
HTTPCode_ELB_4XX
HTTPCode_ELB_5XX
Latency
RequestCount
SpilloverCount
SurgeQueueLength
UnHealthyHostCount

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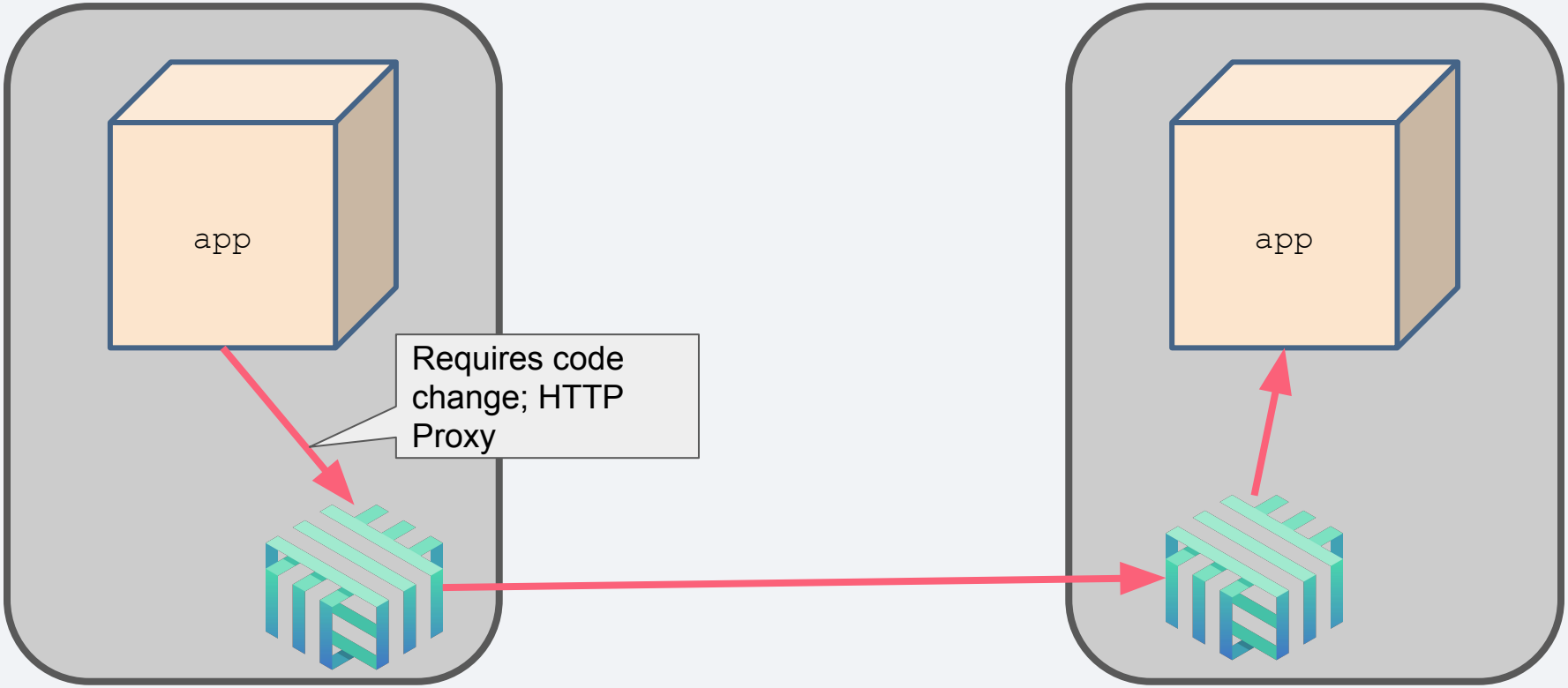
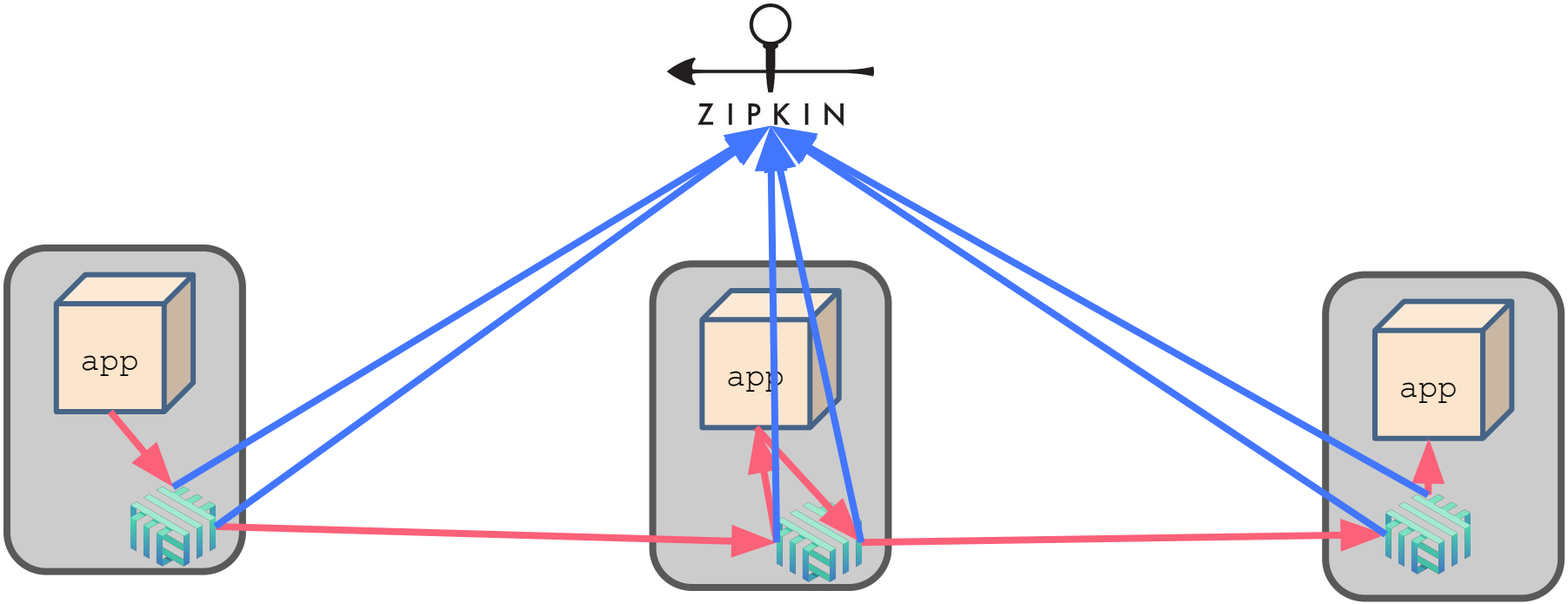
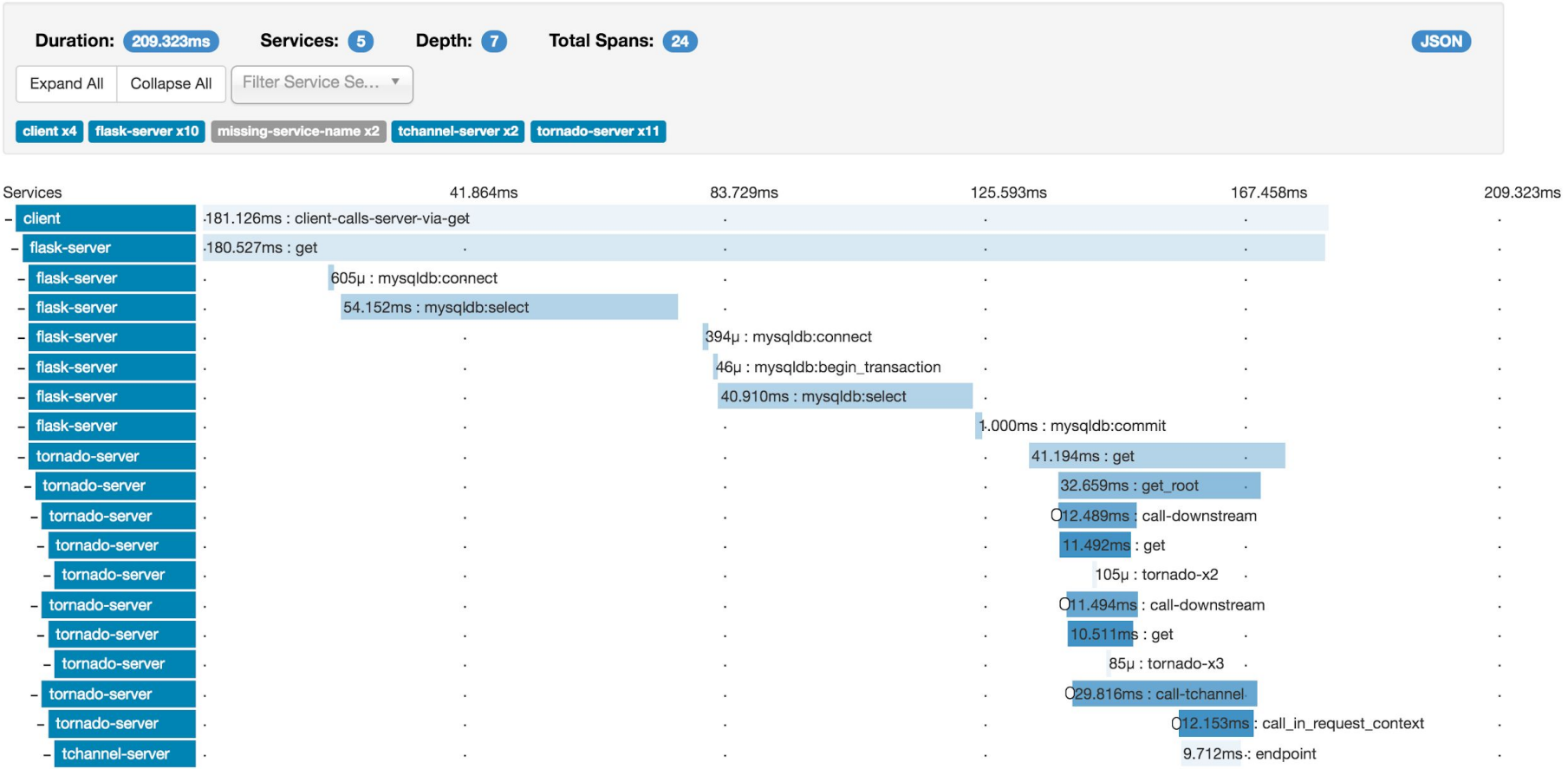
Ansible and AMIs	Docker and ECS	Linkerd 1	Kubernetes	Linkerd 2
StatusCake	AWS Application Load Balancer monitoring only	Zipkin distributed tracing	Prometheus and alertmanager	MAOR metrics, grafana, linkerd dashboard
April 2016	July 2016	May 2017	September 2018	January 2019 - now


app
Requires code change; HTTP Proxy
app

ZIPKIN


ZIPKIN
app
app
app


Duration: 209.323ms
Services: 5
Depth: 7
Total Spans: 24
JSON
Expand All
Collapse All
Filter Service Se...
client x4
flask-server x10
missing-service-name x2
tchannel-server x2
tornado-server x11
Services
41.864ms
83.729ms
125.593ms
167.458ms
209.323ms
client
flask-server
flask-server
flask-server
flask-server
flask-server
flask-server
flask-server
tornado-server
tornado-server
tornado-server
tornado-server
tornado-server
tornado-server
tornado-server
tornado-server
tornado-server
tchannel-server
181.126ms : client-calls-server-via-get
180.527ms : get
605µ : mysqldb:connect
54.152ms : mysqldb:select
394µ : mysqldb:connect
46µ : mysqldb:begin_transaction
40.910ms : mysqldb:select
1.000ms : mysqldb:commit
41.194ms : get
32.659ms : get_root
12.489ms : call-downstream
11.492ms : get
105µ : tornado-x2
11.494ms : call-downstream
10.511ms : get
85µ : tornado-x3
29.816ms : call-tchannel
12.153ms : call_in_request_context
9.712ms : endpoint

Goals:

1. Minimise non-feature work for teams
2. Not dependent on teams operational exp.

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Internal PaaS

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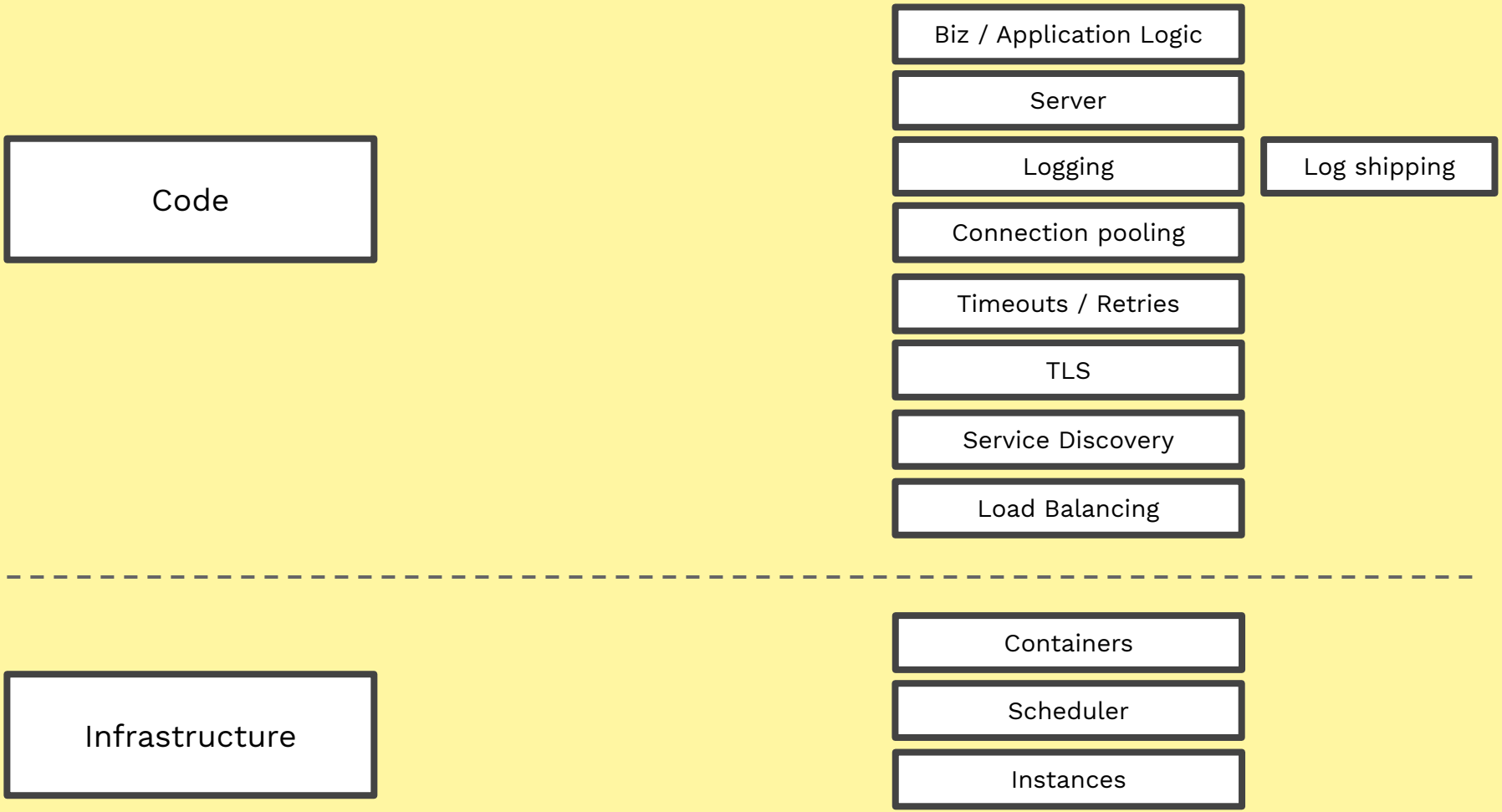
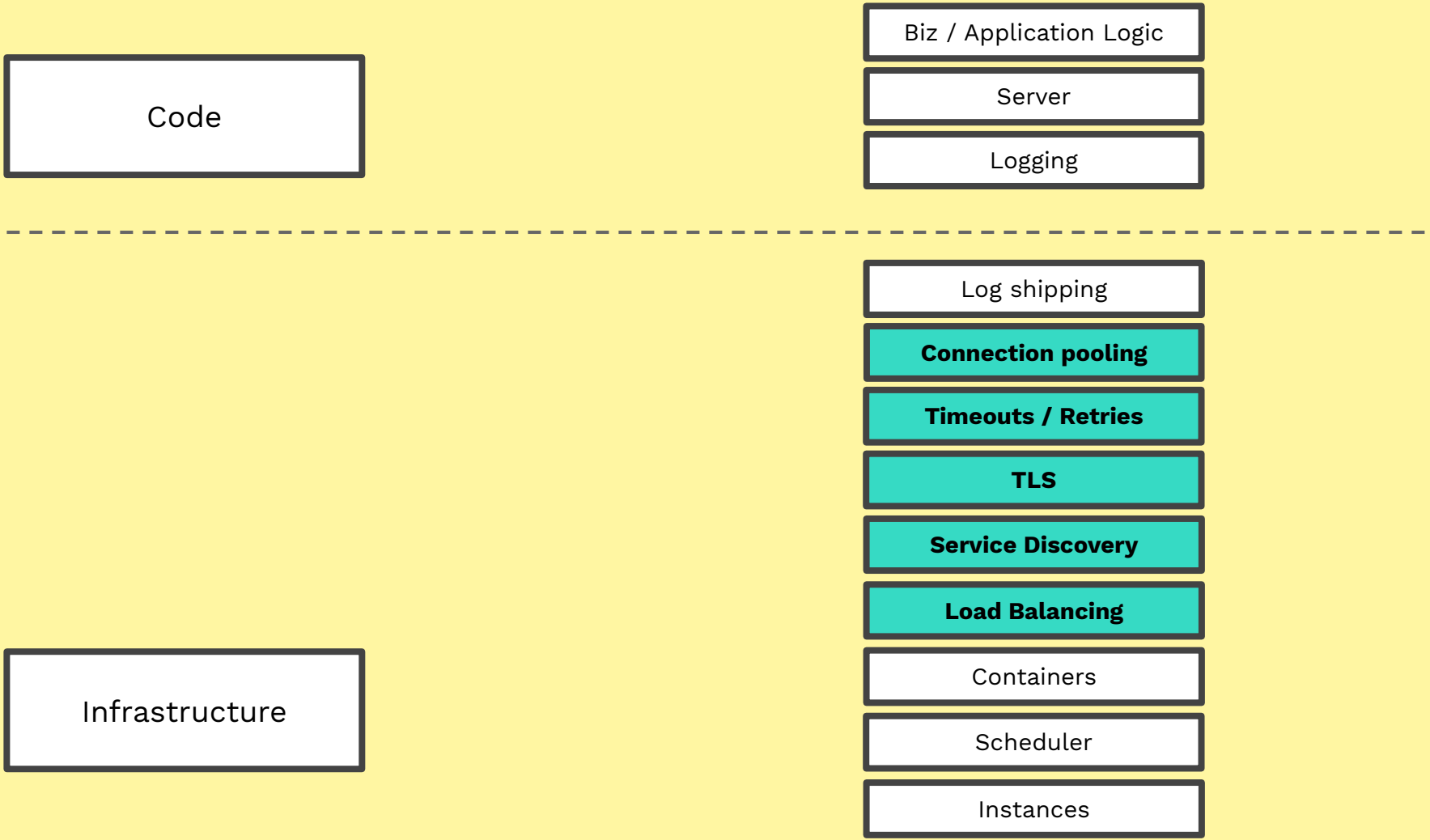
Code
Infrastructure


Code
Biz / Application Logic
Server
Logging
Log shipping
Connection pooling
Timeouts / Retries
TLS
Service Discovery
Load Balancing
Infrastructure
Containers
Scheduler
Instances


Code
Biz / Application Logic
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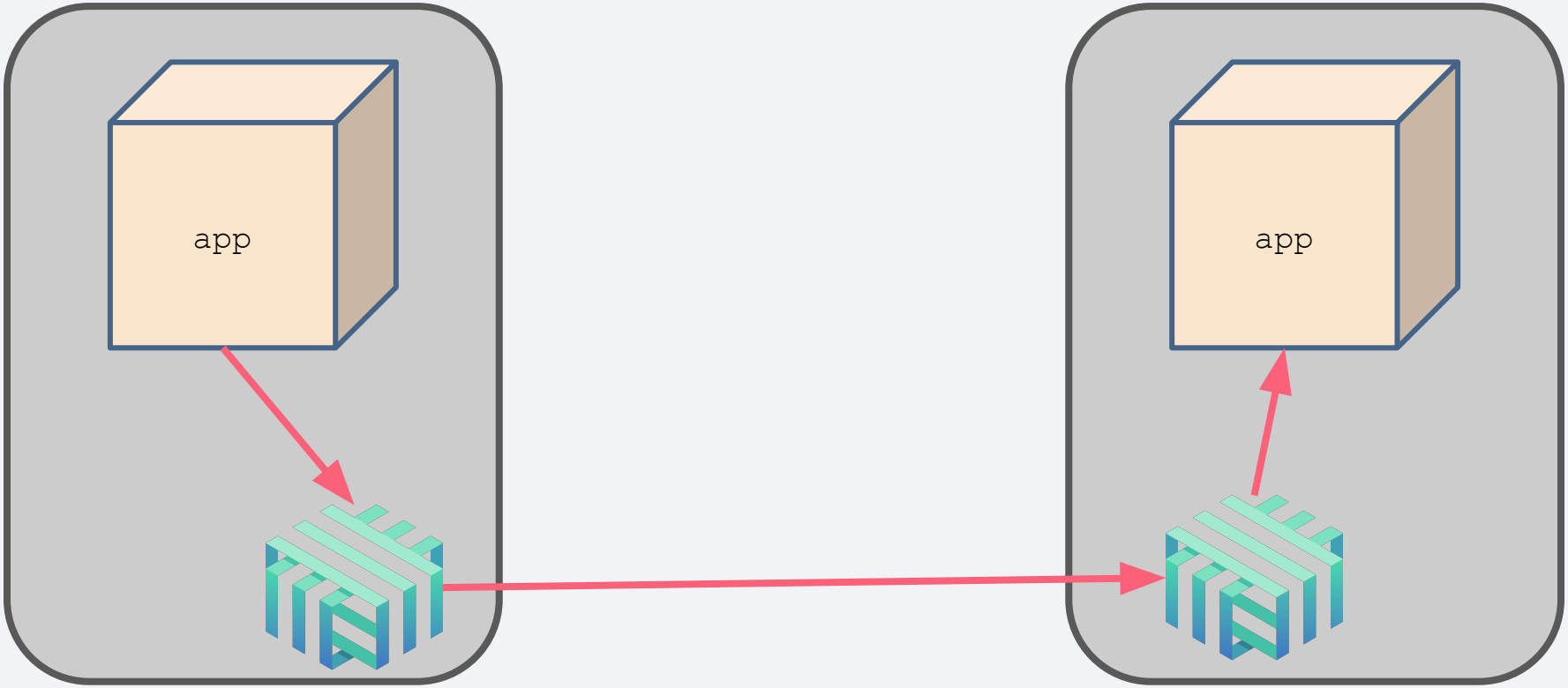
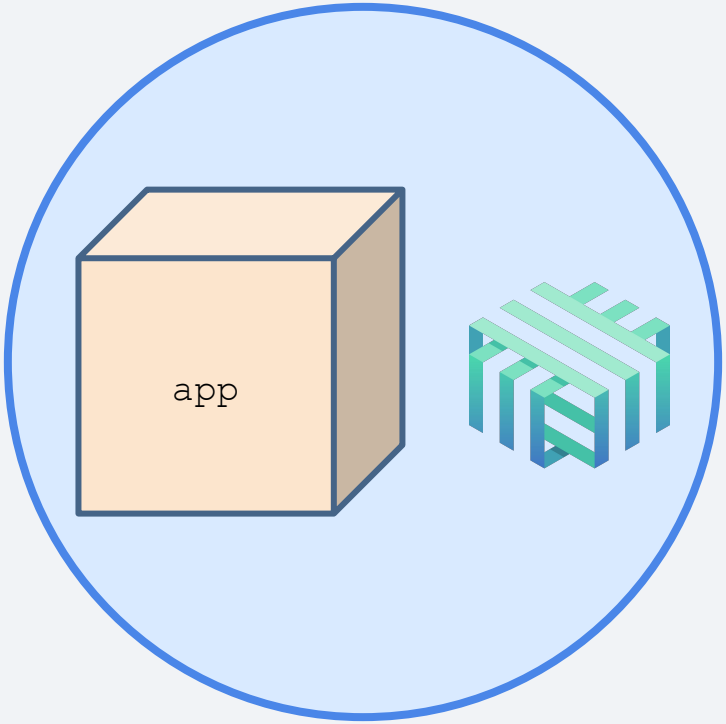
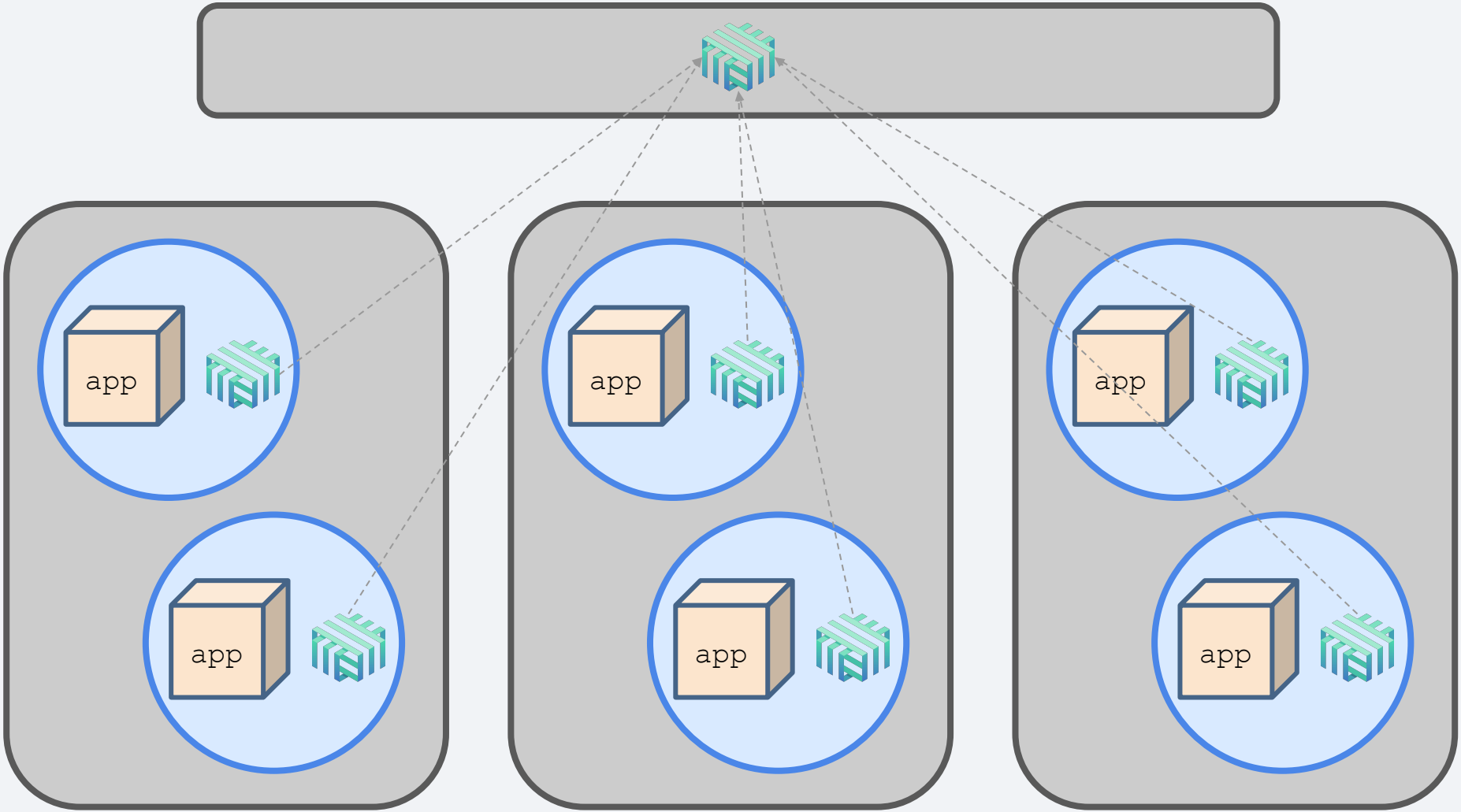
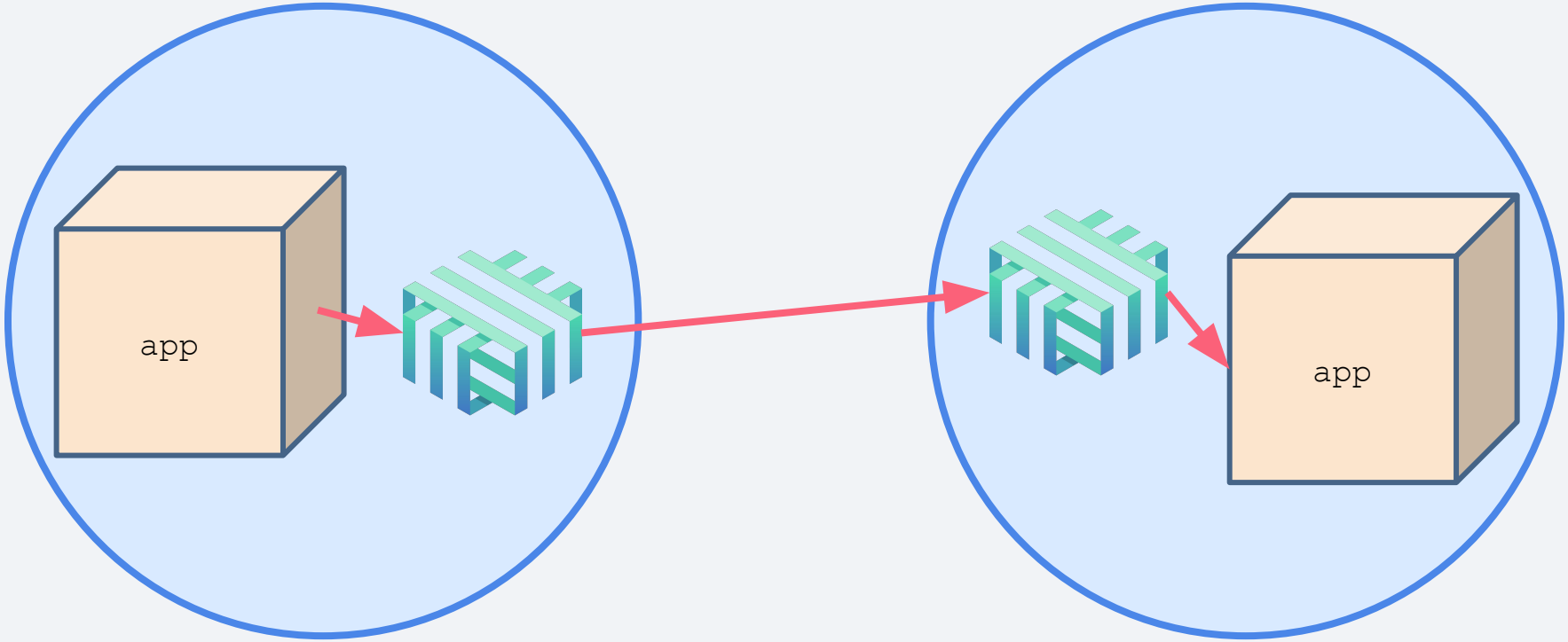

app
app


app


app
app
app
app
app
app


app
app

request_total

response_total

response_latency_ms

route_request_total

route_response_latency_ms

route_response_total

```yaml
apiVersion: linkerd.io/v1alpha1
kind: ServiceProfile
metadata:
 annotations:
 name: phone-verification.default.svc.cluster.local
 namespace: default
spec:
 routes:
   - condition:
       method: POST
       pathRegex: /verification
     name: POST /verification
     responseClasses:
       - condition:
           status:
             min: 409
         isFailure: false
     timeout: 100ms
   - condition:
       method: GET
       pathRegex: /verification/\d+
     name: GET /verification/{code}
     responseClasses:
       - condition:
           any:
             - status:
                 min: 404
             - status:
                 min: 401
         isFailure: false
     timeout: 50ms
```

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Linkerd1	**Linkerd2**
Scala (JVM based)	Go & Rust
Once per node	Once per pod
Config applies to all requests	Config applies to specific routes
Config lives globally	Config lives with each application repo
TLS between nodes	TLS between pods
Application requires knowledge	App is totally oblivious

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demo

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Linkerd2

ATTEST

- ➔ **Reduce operational load for feature teams**
- ➔ **Customised to each specific app; solving out-of-service problem**
- ➔ **Dashboard surfaces “detailed what”, getting closer to the “why”**
- ➔ **Slack channel is huge resource, great community**
- ➔ **But:**
  - ◆ Only k8s
  - ◆ Needs control plane

Hiring!

https://team.askattest.com

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@askattest
medium.com/attest-engineering