Sweet Streams are Made of These

Data Driven Development for Stream Processing

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Introduction

- Caito Scherr

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- Caito Scherr
- Developer Advocate

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- Caito Scherr
- Developer Advocate
- Ververica, GmbH

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- Caito Scherr
- Developer Advocate
- Ververica, GmbH
- Portland, OR, USA

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Introduction

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Agenda

- The Challenge
- “Metrics-Driven Metrics”
- Metrics as a Shared Language

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- Metrics as a Shared Language

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Before We Start...

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Before We Start...

The Challenge

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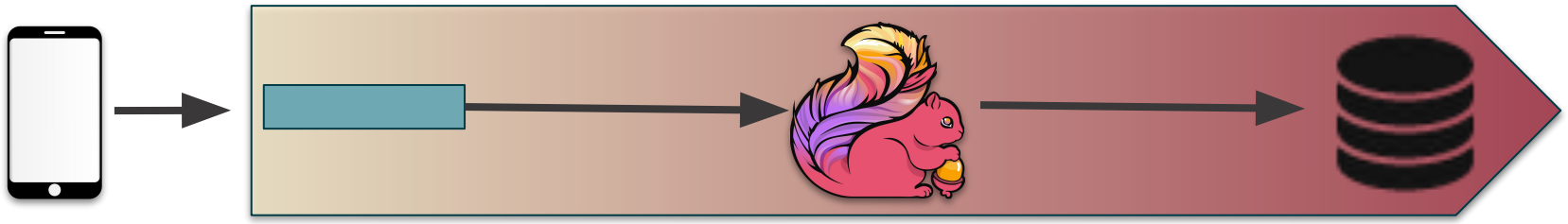
The Challenge



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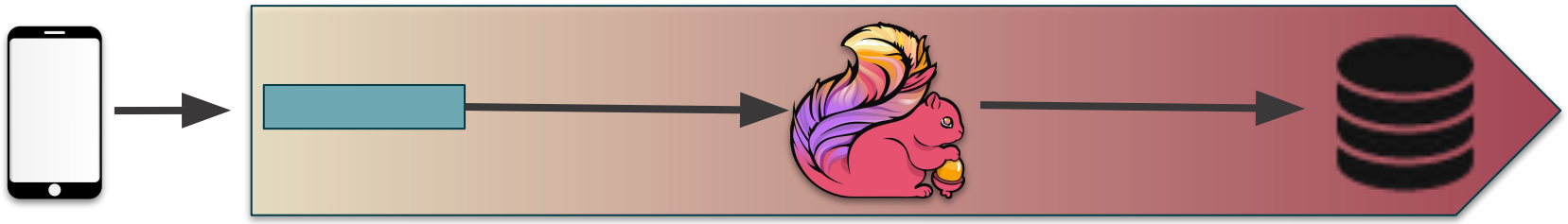

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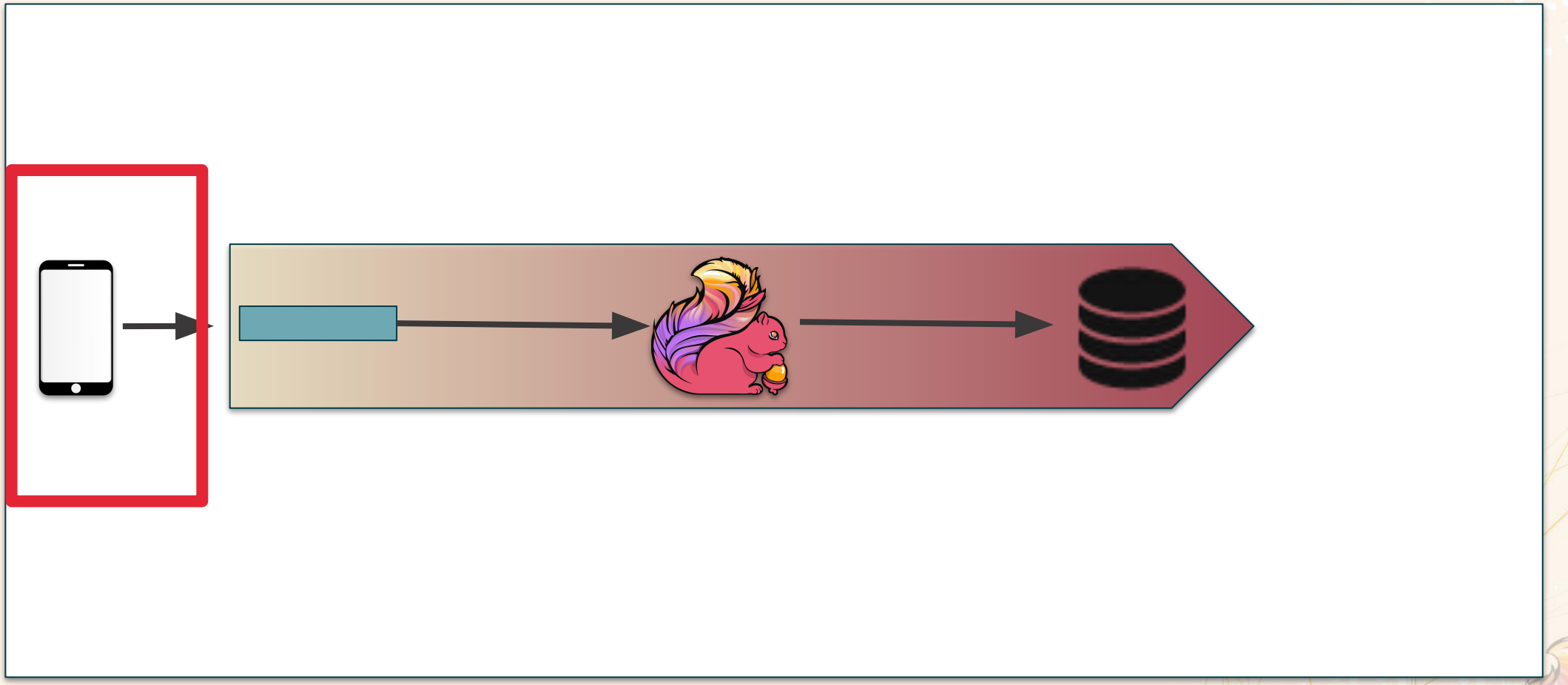

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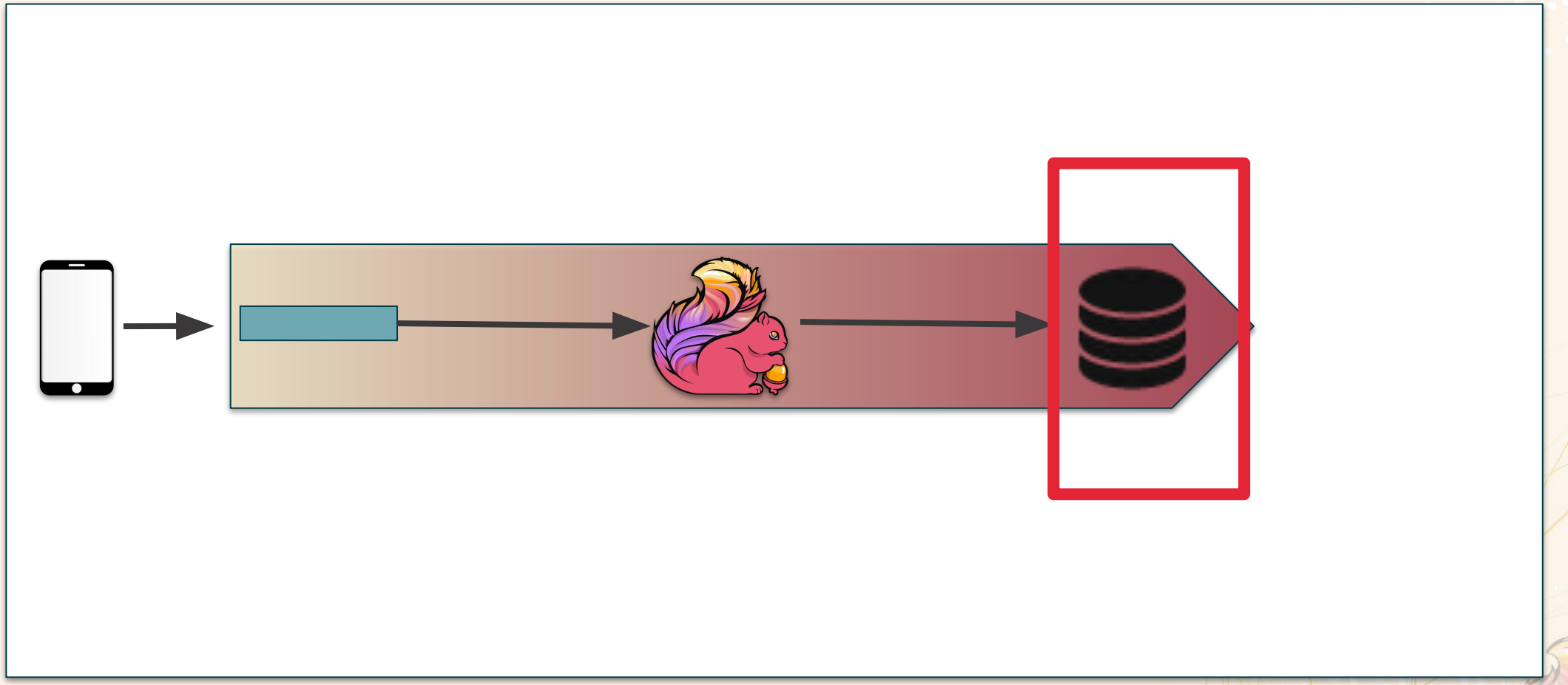

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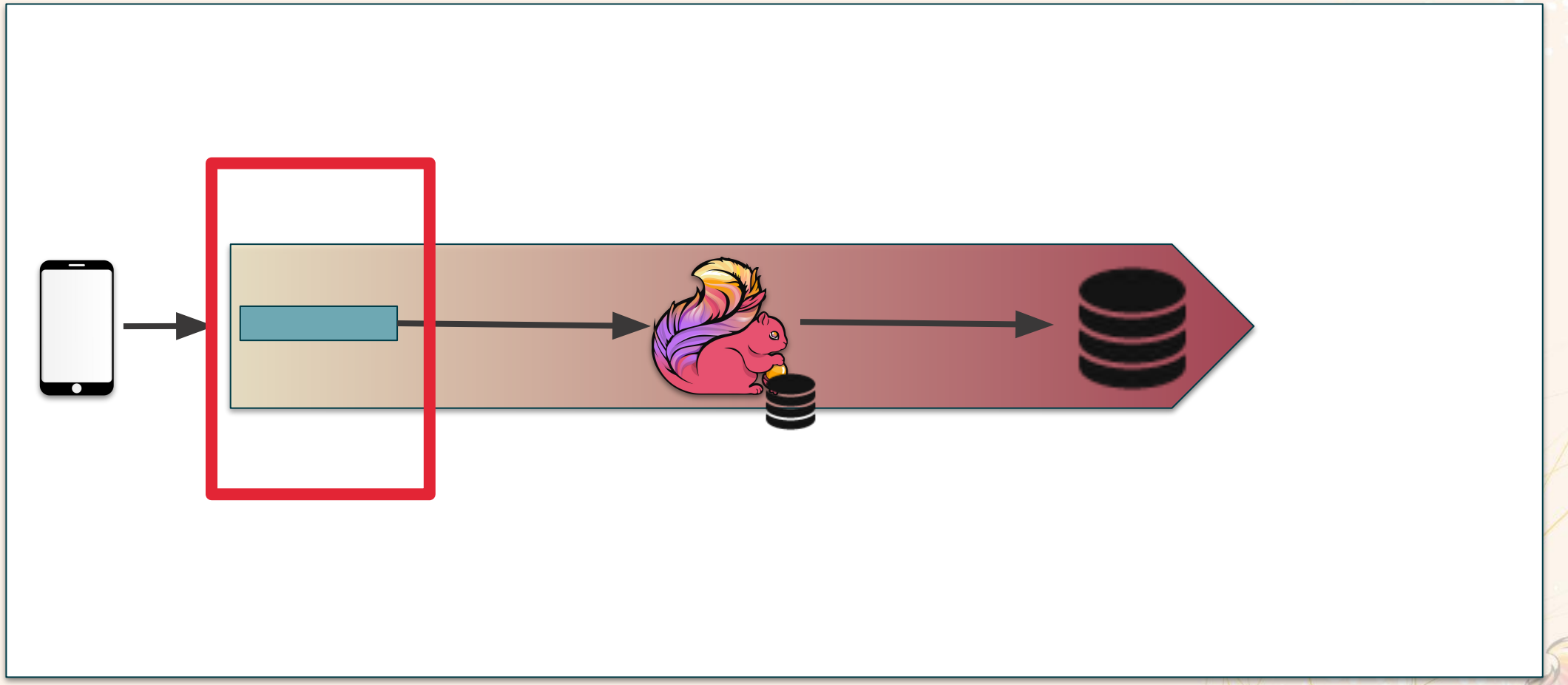

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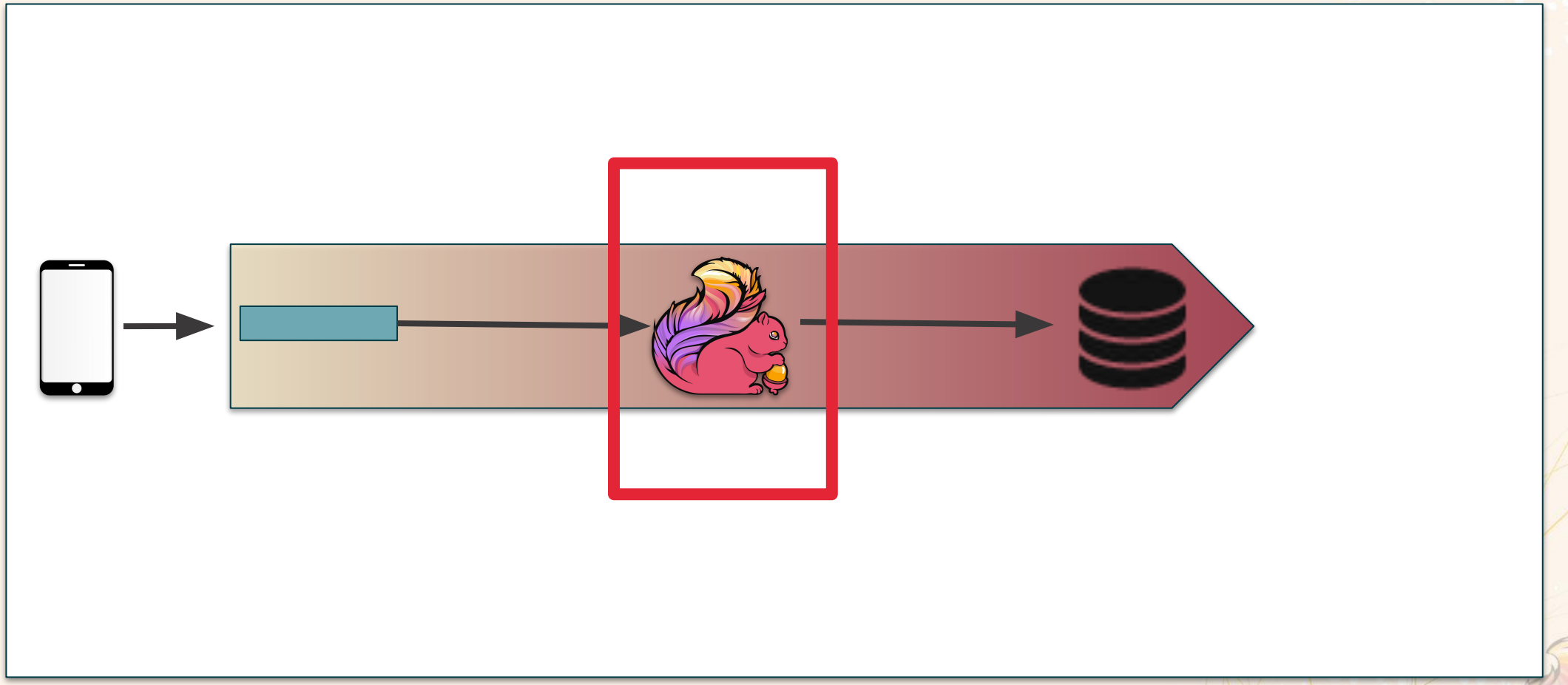

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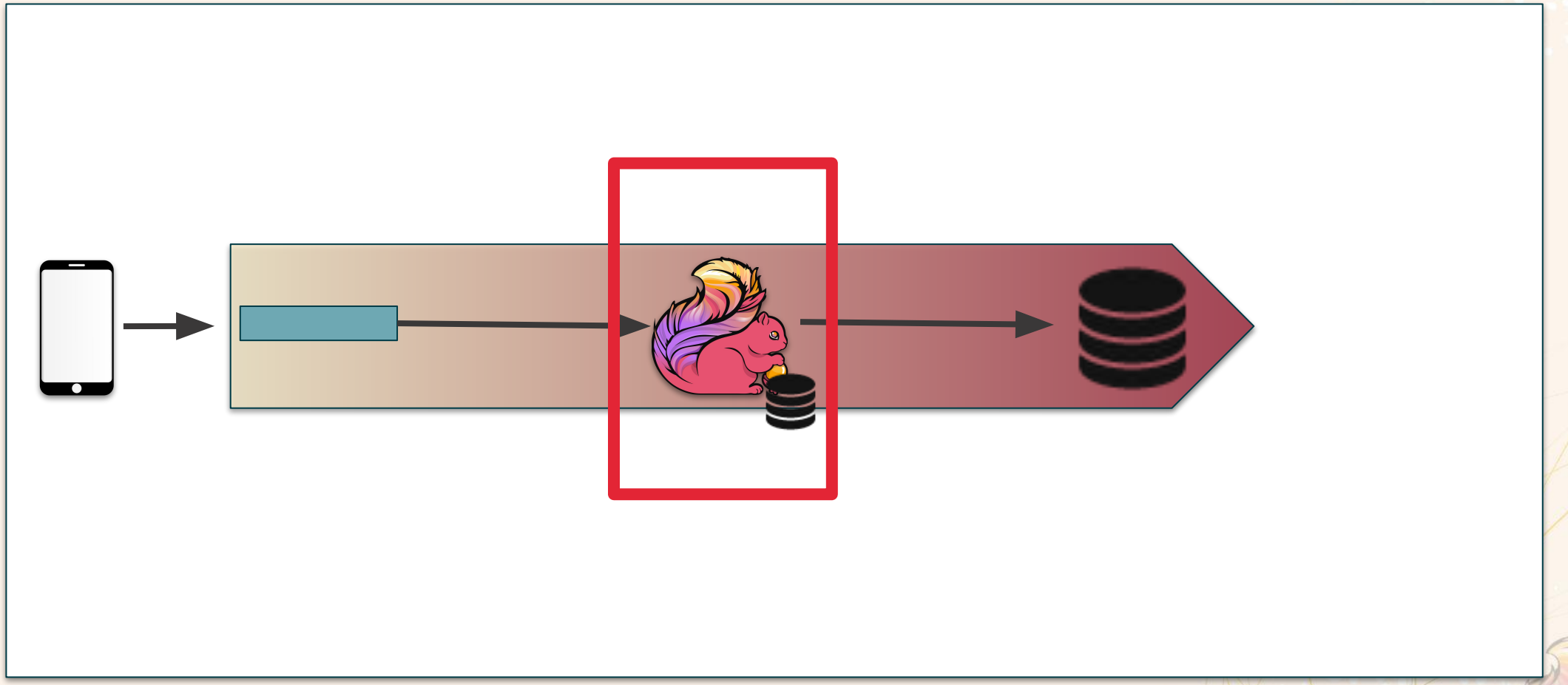

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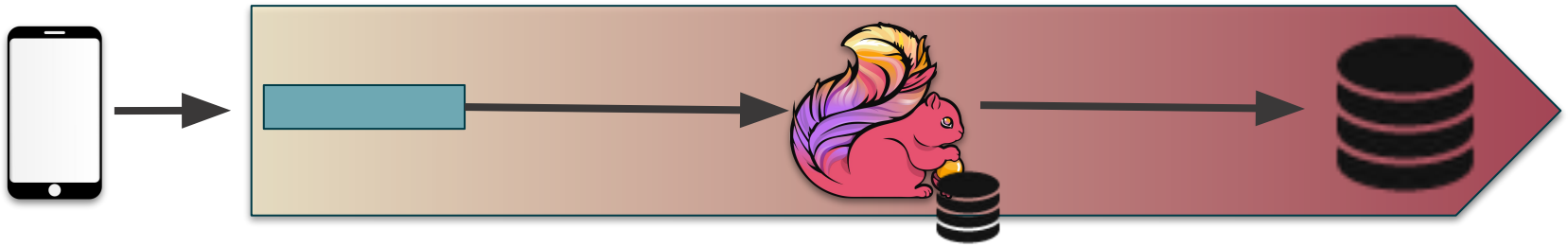

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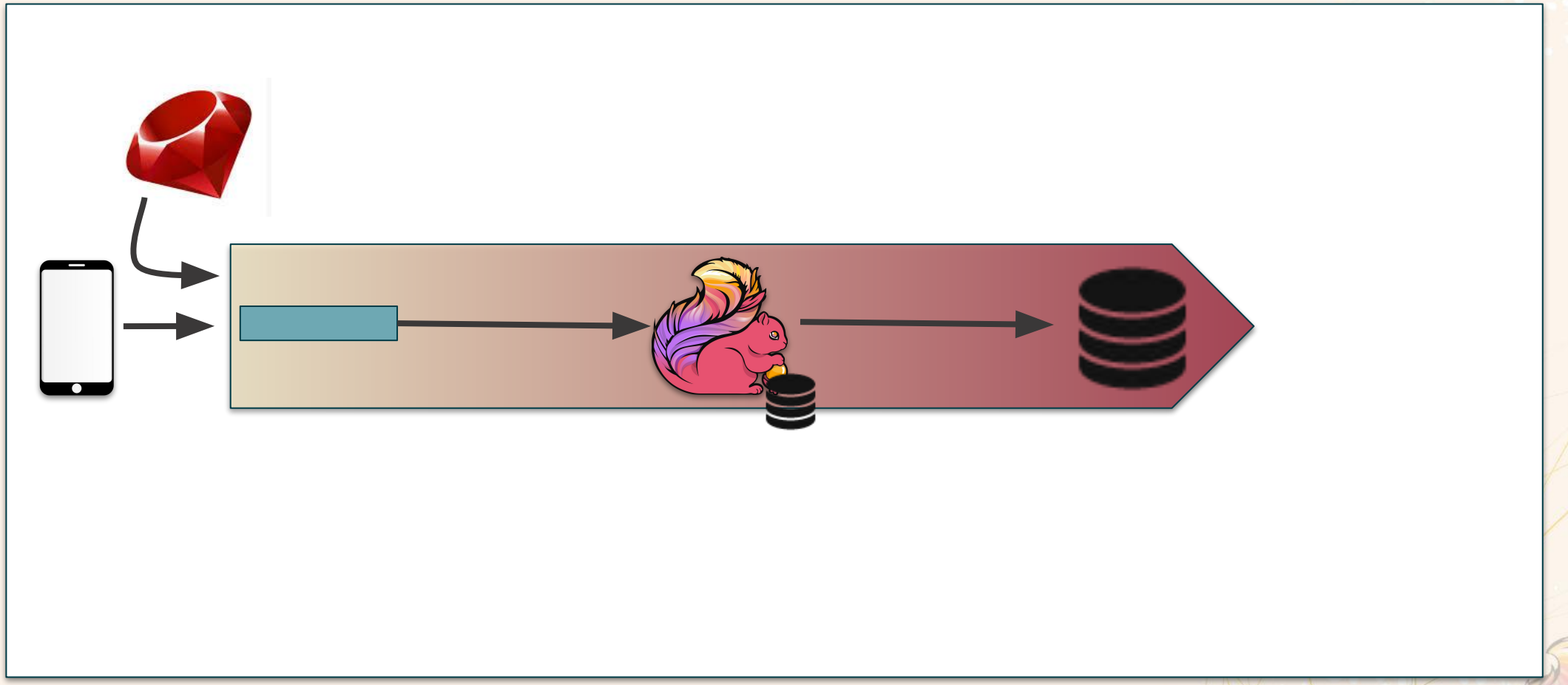

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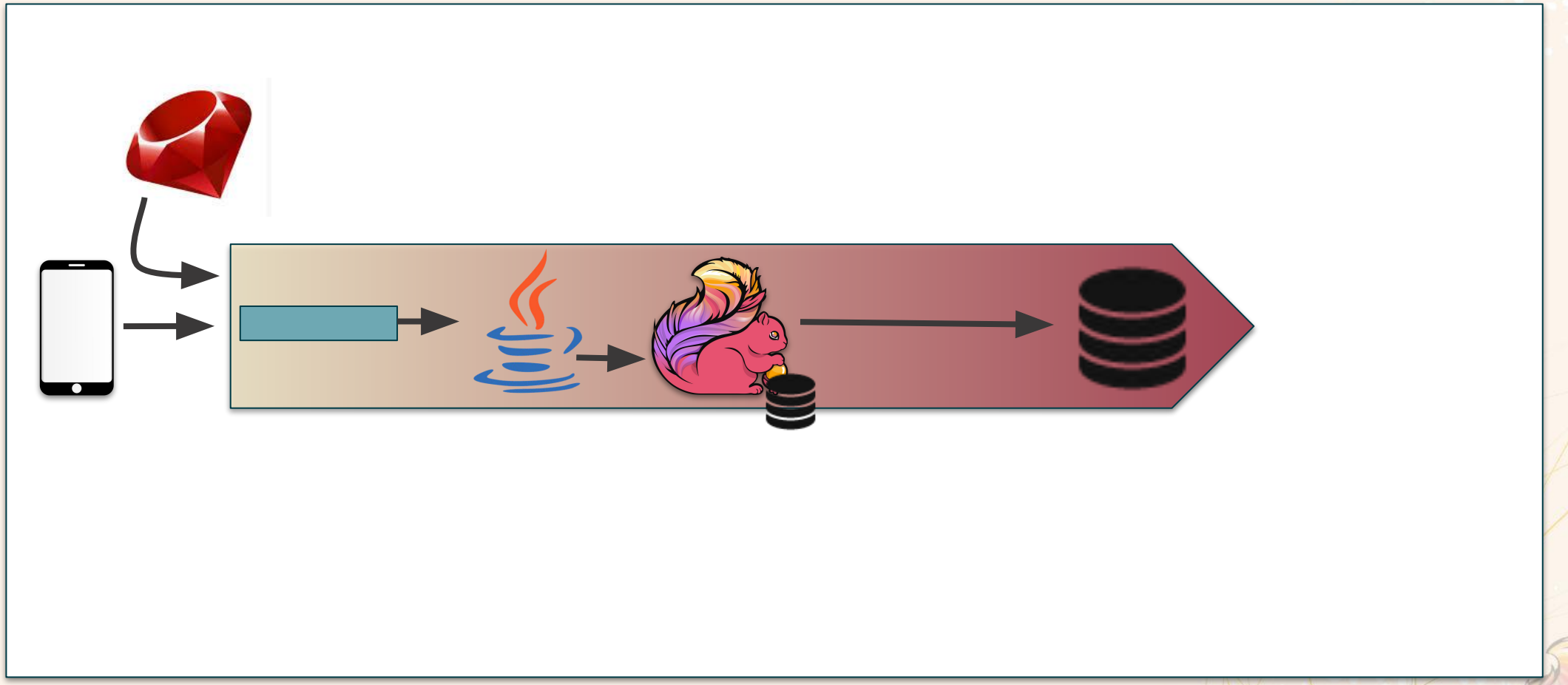

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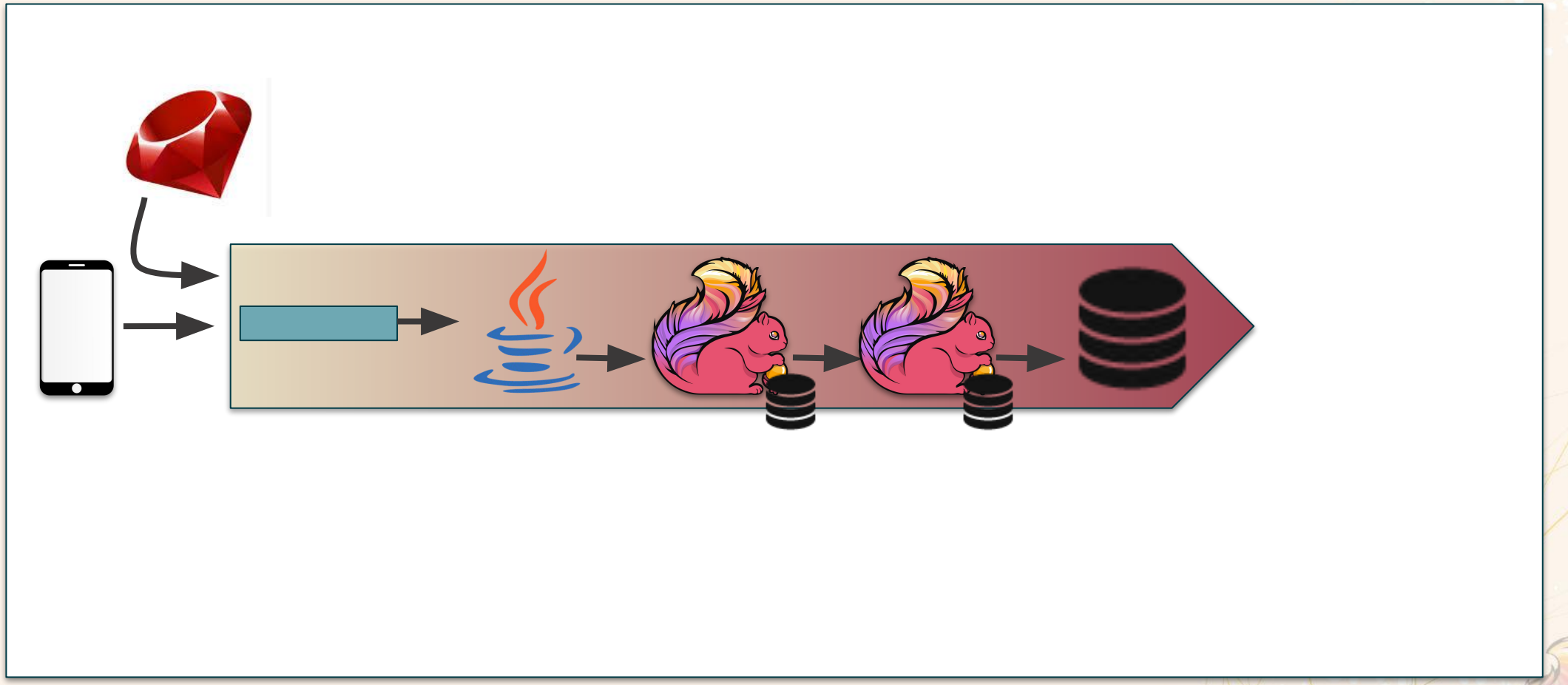

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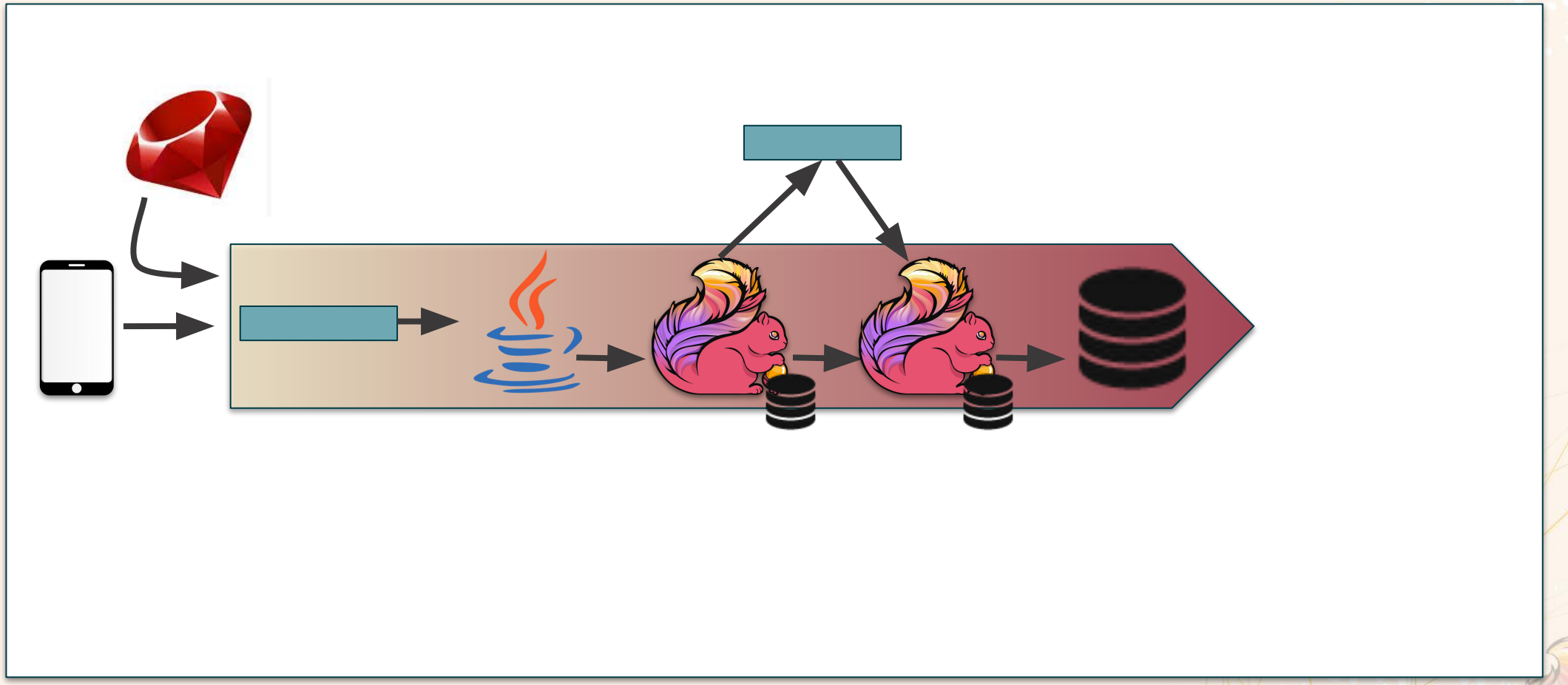

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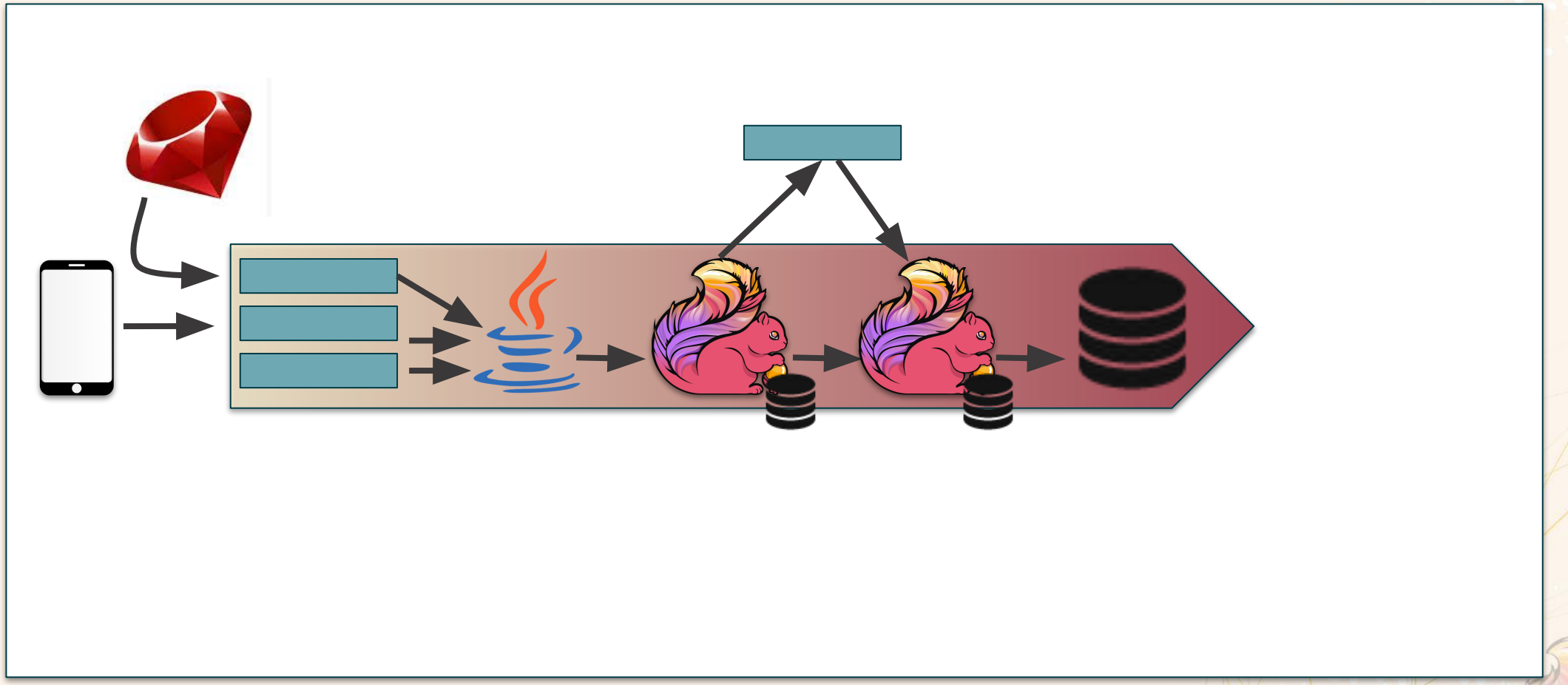

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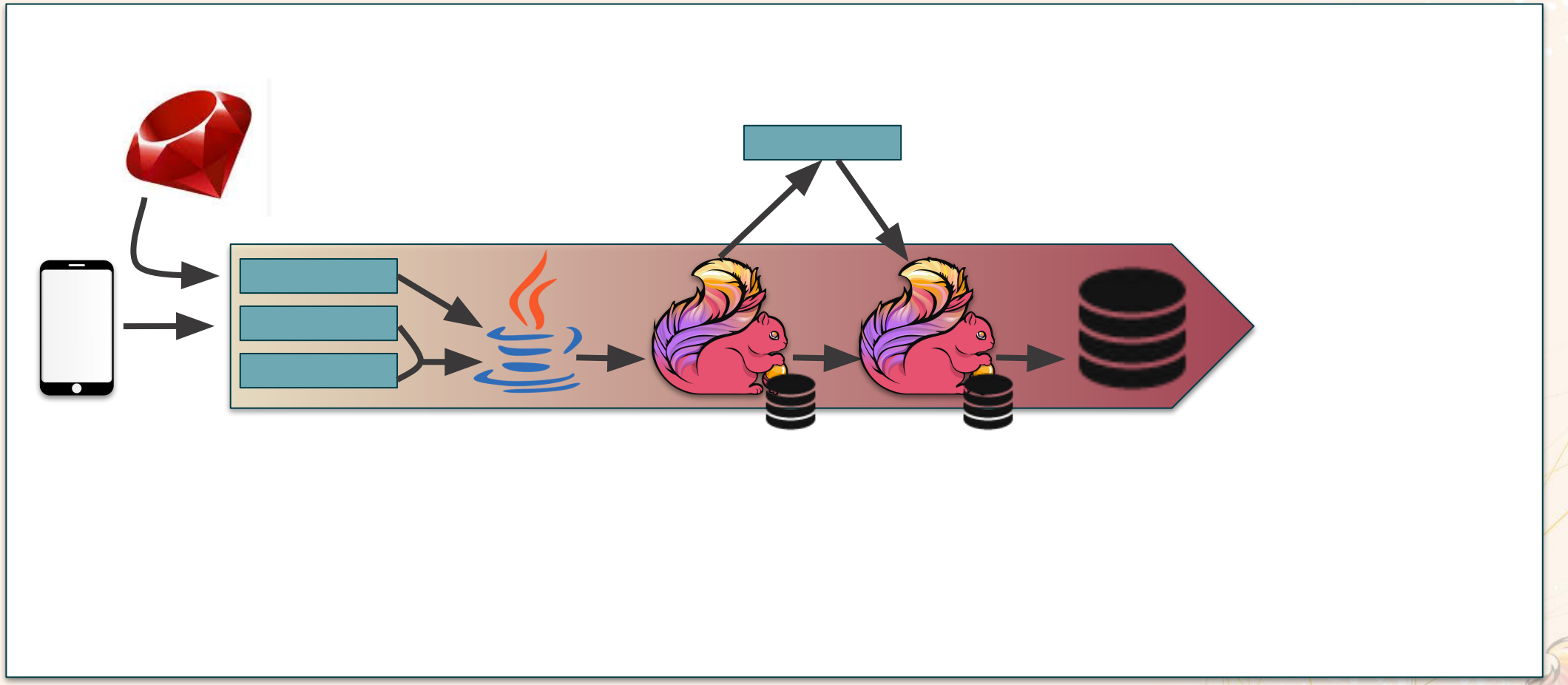

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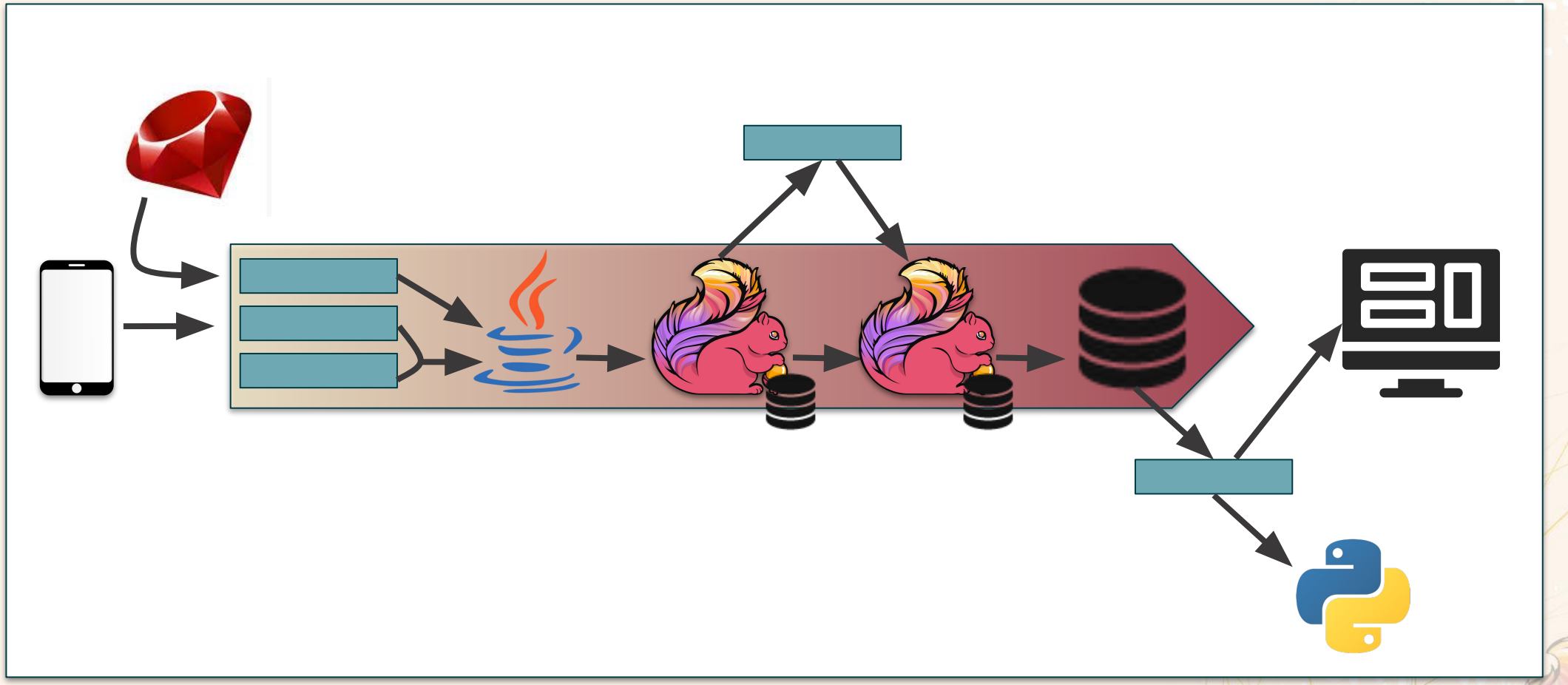

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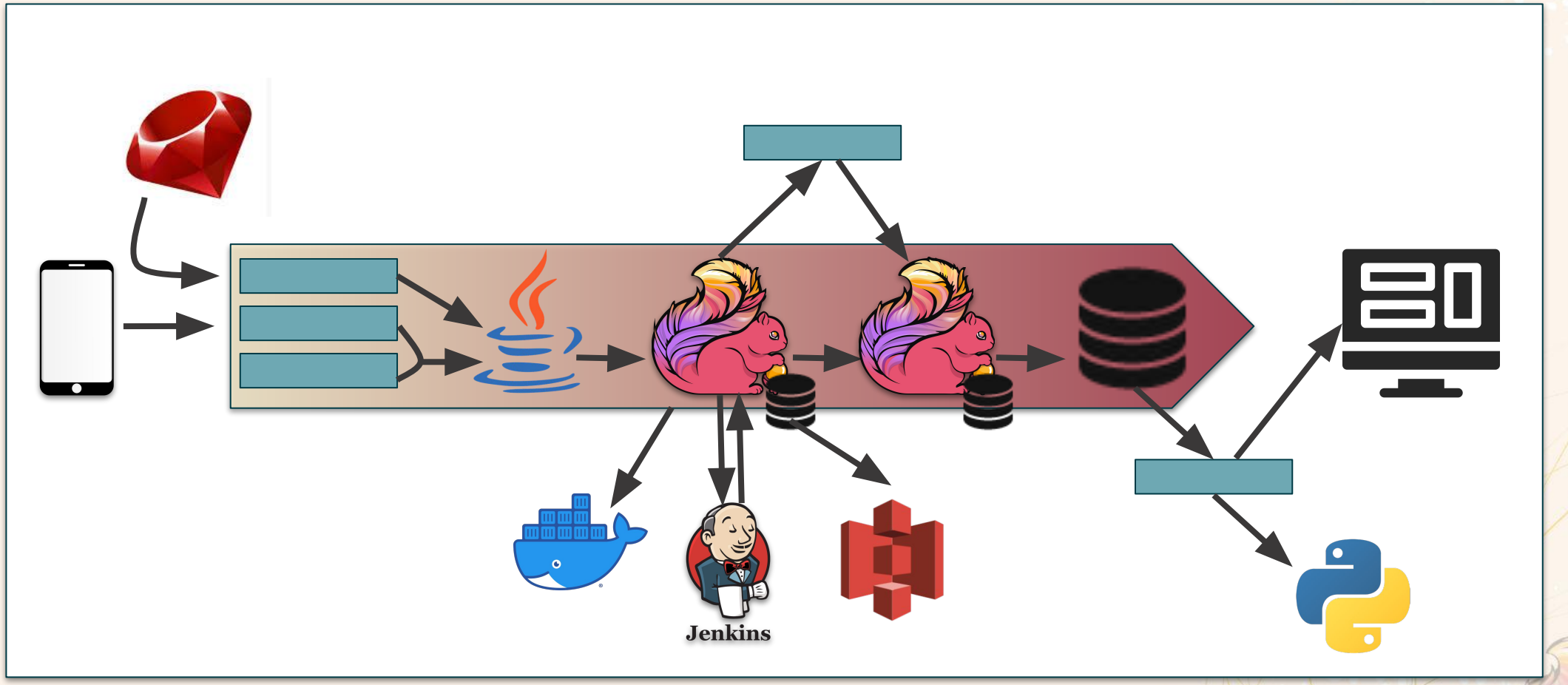

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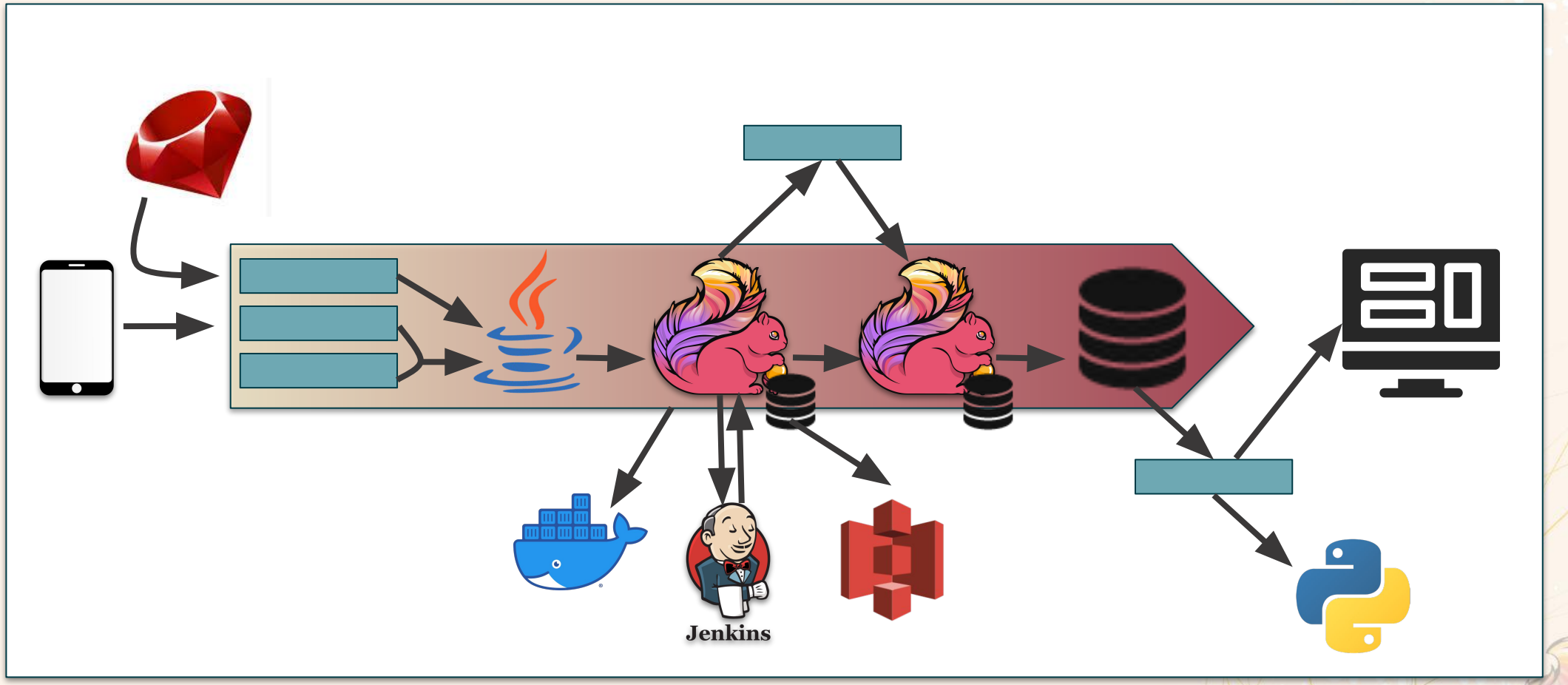

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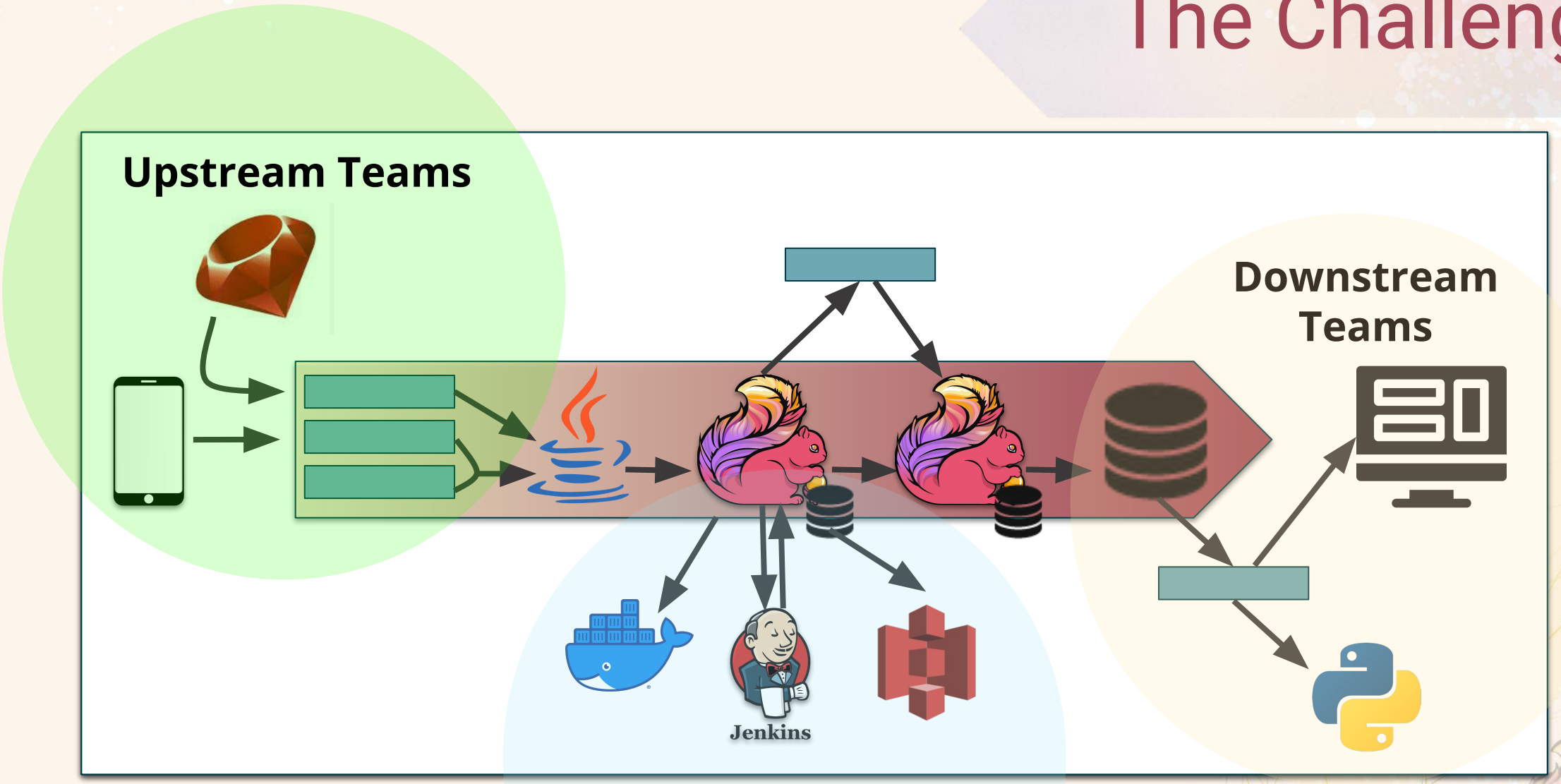

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"Metrics-Driven Metrics"

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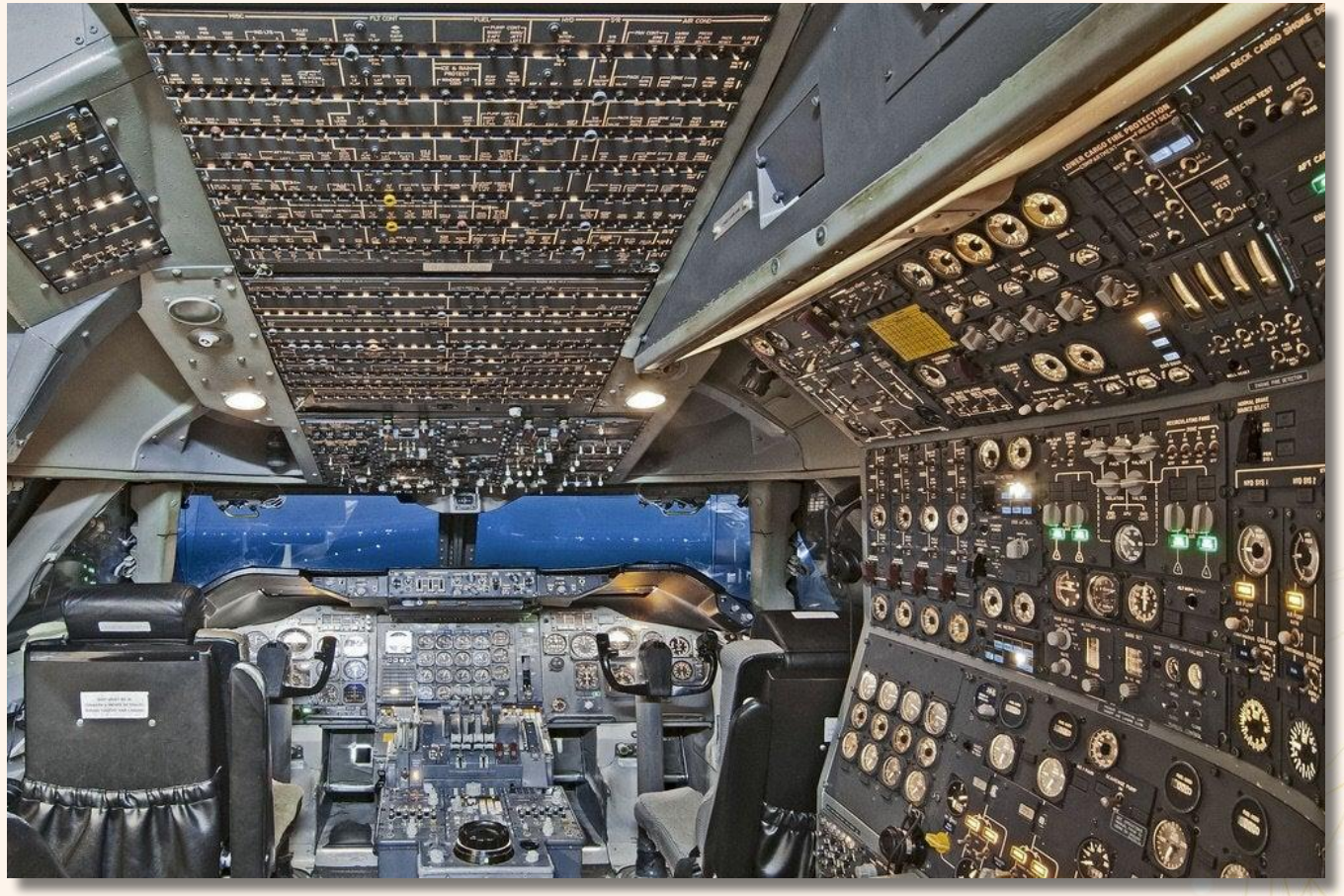
Metrics-Driven Metrics

"You can measure almost anything, but you cannot pay attention to everything"

Metrics-Driven Metrics

"Any situation where people create their own dashboards without structure, quickly starts to look like the cockpit of a 747"

Metrics-Driven Metrics



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Metrics-Driven Metrics

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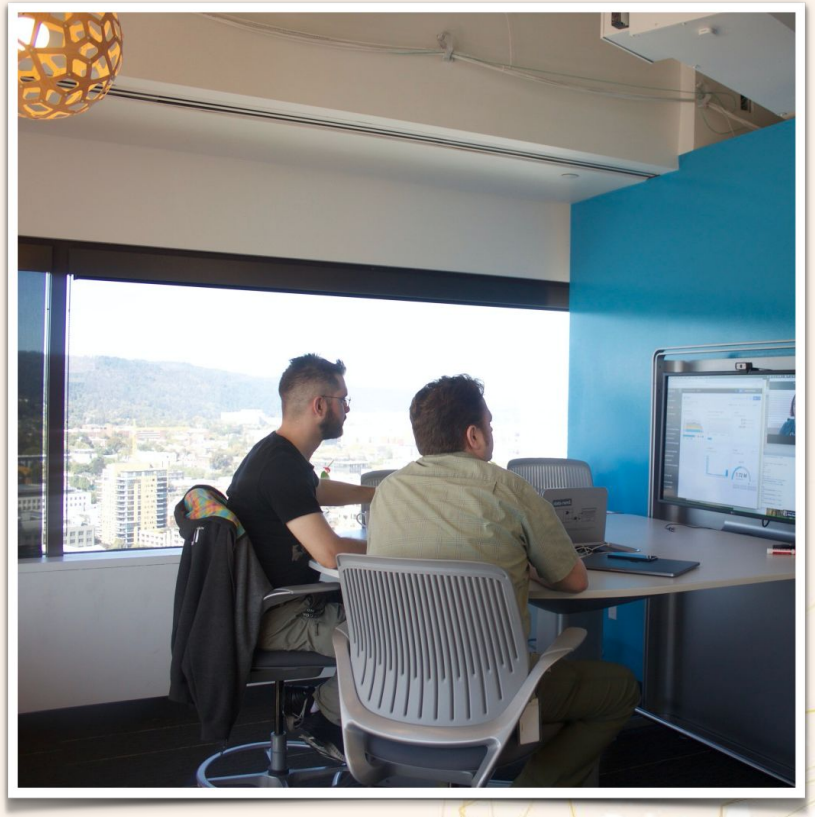
Metrics-Driven Metrics

The dashboard should **be**:

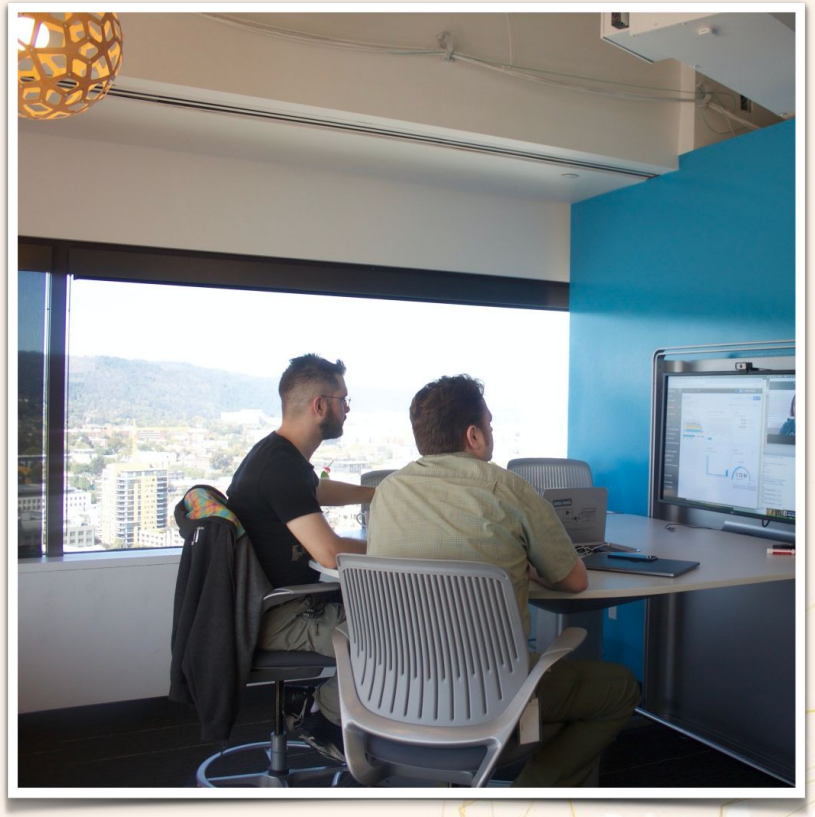
- Meaningful
- Iterative
- Accessible



Metrics-Driven Metrics

The dashboard should **reflect** your:

- Roadmap
- Highest Risk
- Most uncertain metrics



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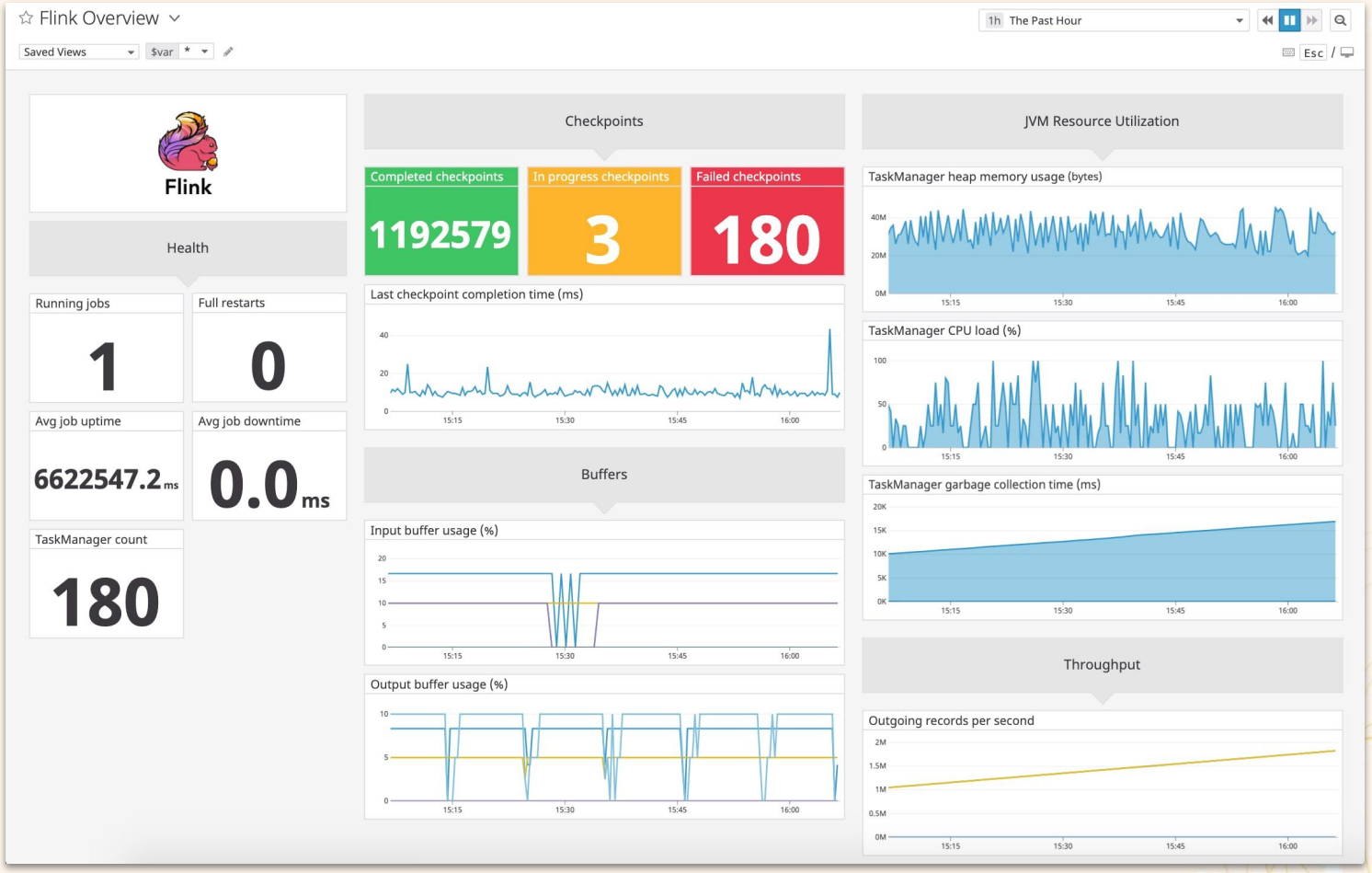

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Metrics-Driven Metrics

Flink Overview

Saved Views | $var *

1h The Past Hour

Esc /

Flink

Health

Running jobs	Full restarts
1	0

Avg job uptime	Avg job downtime
6622547.2 ms	0.0 ms

TaskManager count

180

Checkpoints

Completed checkpoints	In progress checkpoints	Failed checkpoints
1192579	3	180

Last checkpoint completion time (ms)

Buffers

Input buffer usage (%)

Output buffer usage (%)

JVM Resource Utilization

TaskManager heap memory usage (bytes)

TaskManager CPU load (%)

TaskManager garbage collection time (ms)

Throughput

Outgoing records per second

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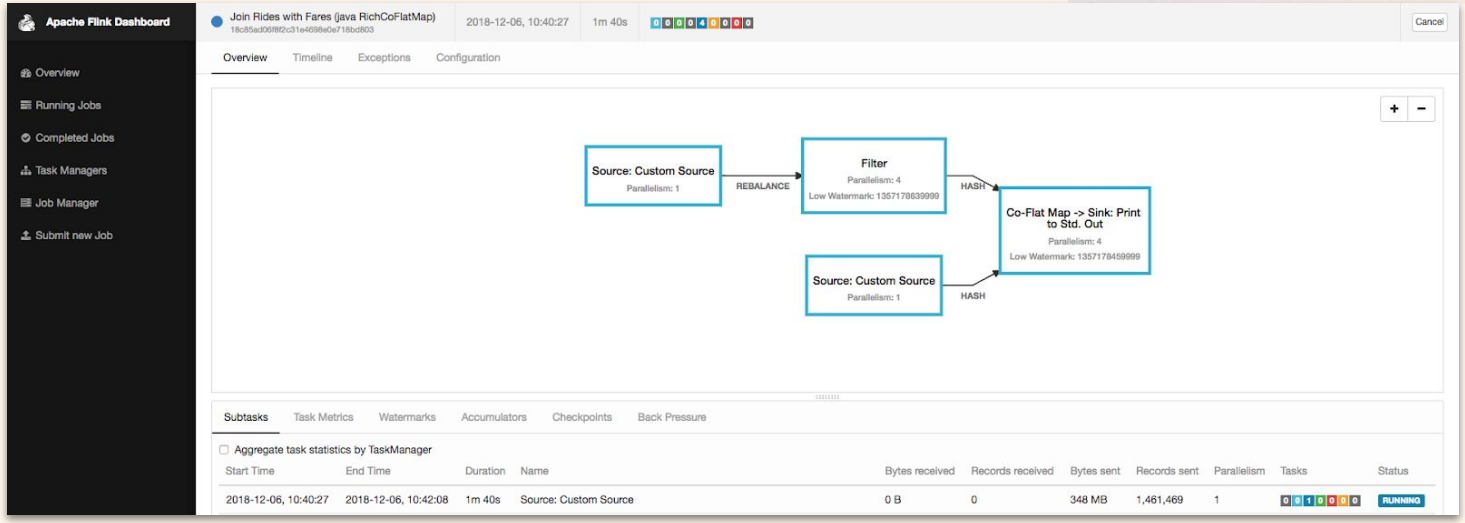
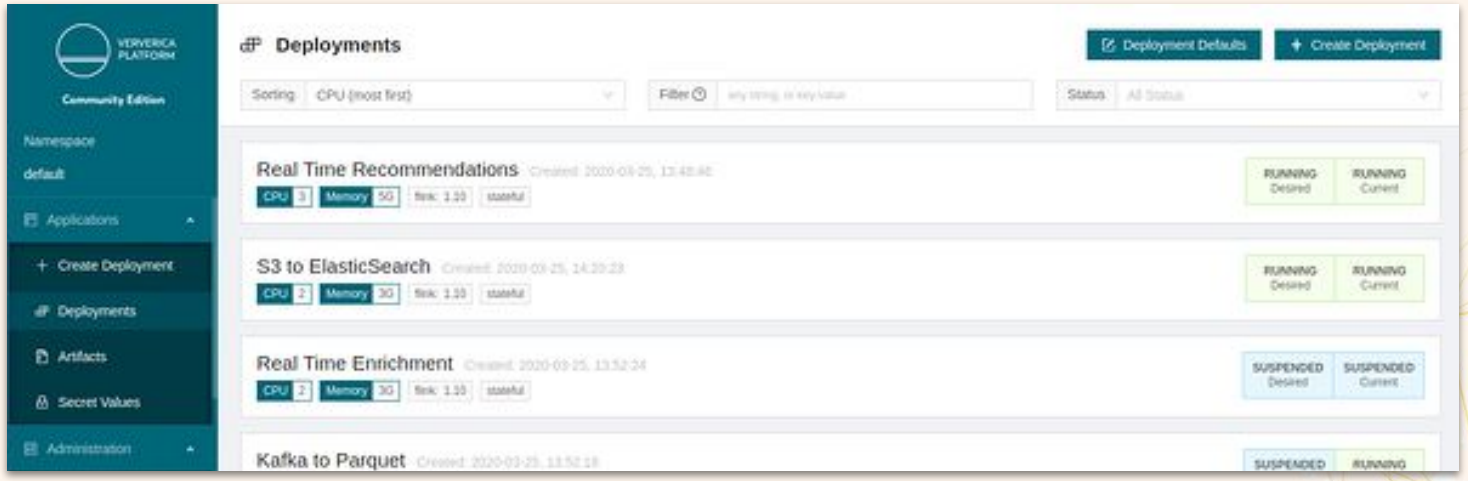
Metrics-Driven Metrics





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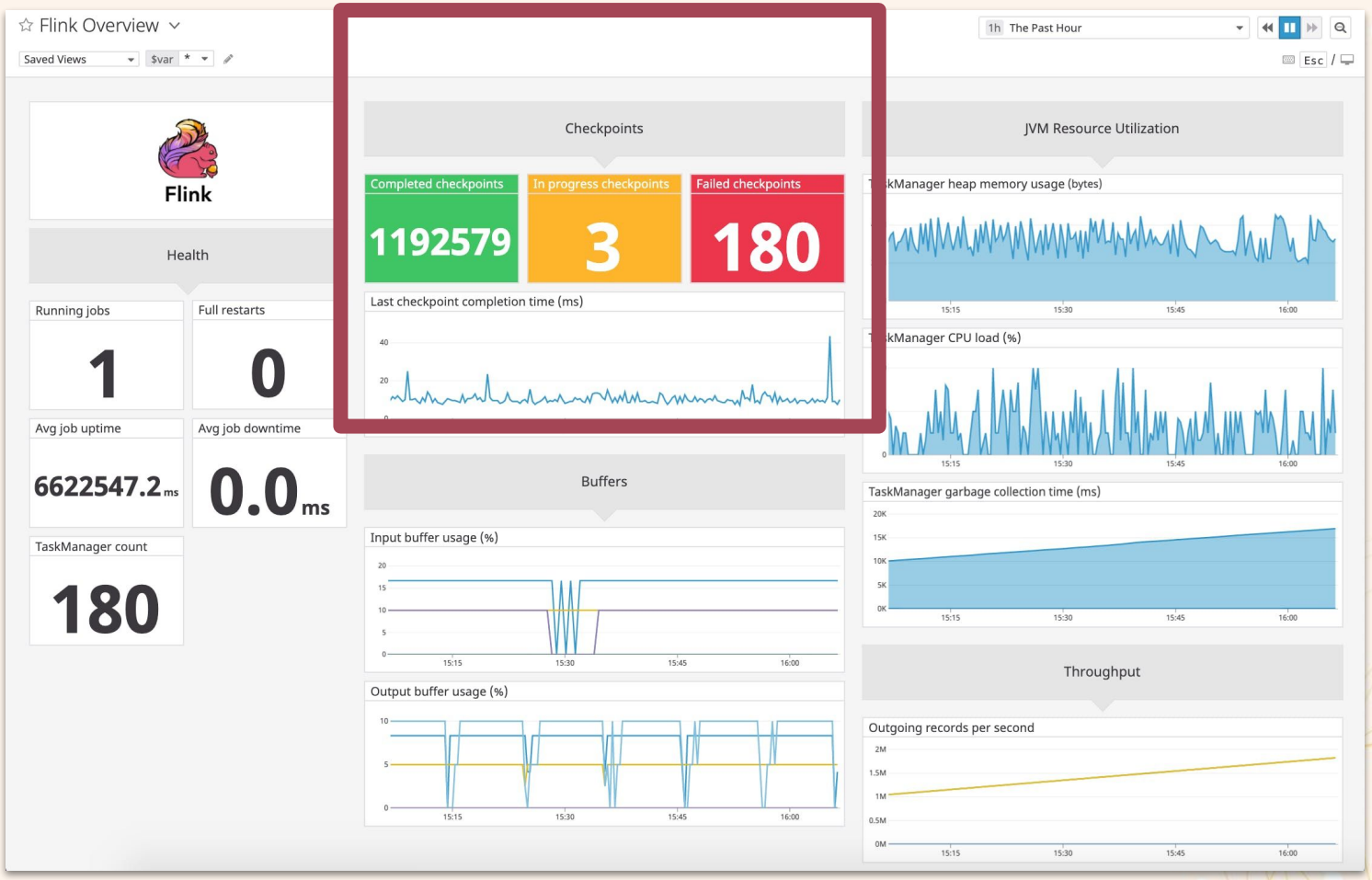

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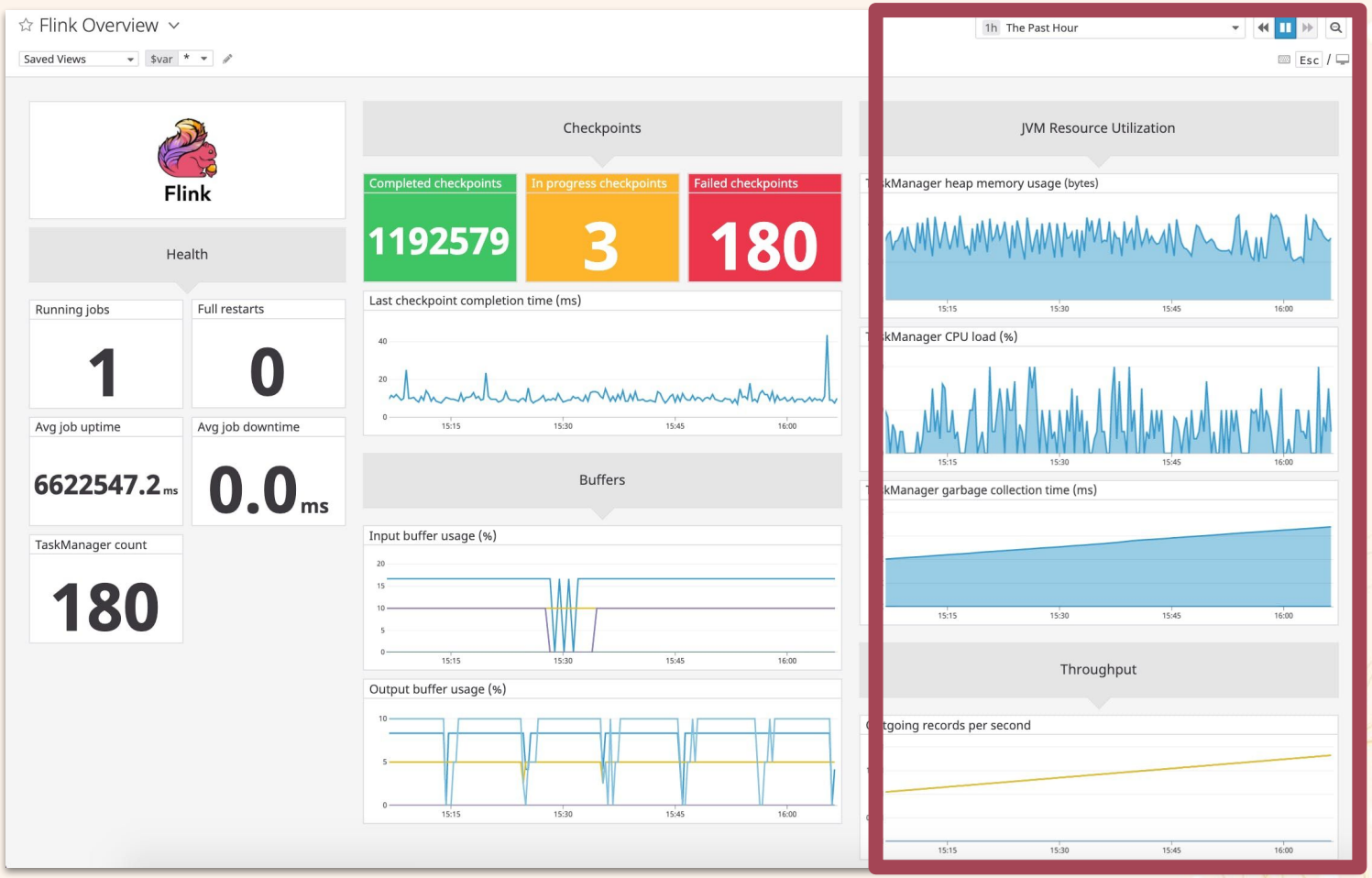

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Metrics-Driven Metrics

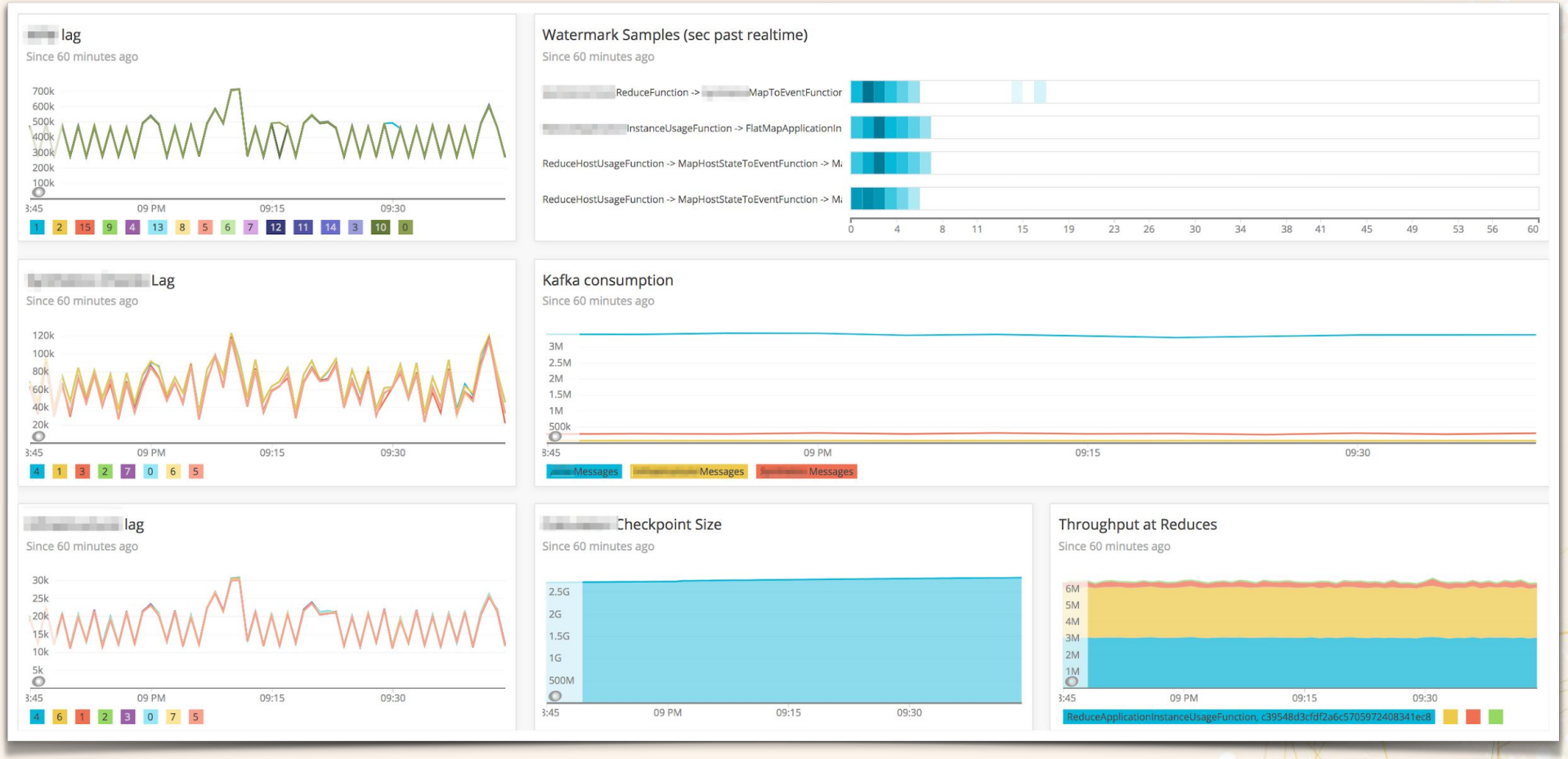
Prometheus

```
metrics.reporter.prom.class: org.apache.flink.metrics.prometheus.PrometheusReporter
```

DataDog

```
metrics.reporter.dghttp.factory.class: org.apache.flink.metrics.datadog.DatadogHttpRepo
rterFactory
metrics.reporter.dghttp.apikey: xxx
metrics.reporter.dghttp.tags: myflinkapp,prod
metrics.reporter.dghttp.proxyHost: my.web.proxy.com
metrics.reporter.dghttp.proxyPort: 8080
metrics.reporter.dghttp.dataCenter: US
metrics.reporter.dghttp.maxMetricsPerRequest: 2000
metrics.reporter.dghttp.interval: 60 SECONDS
```

Metrics-Driven Metrics



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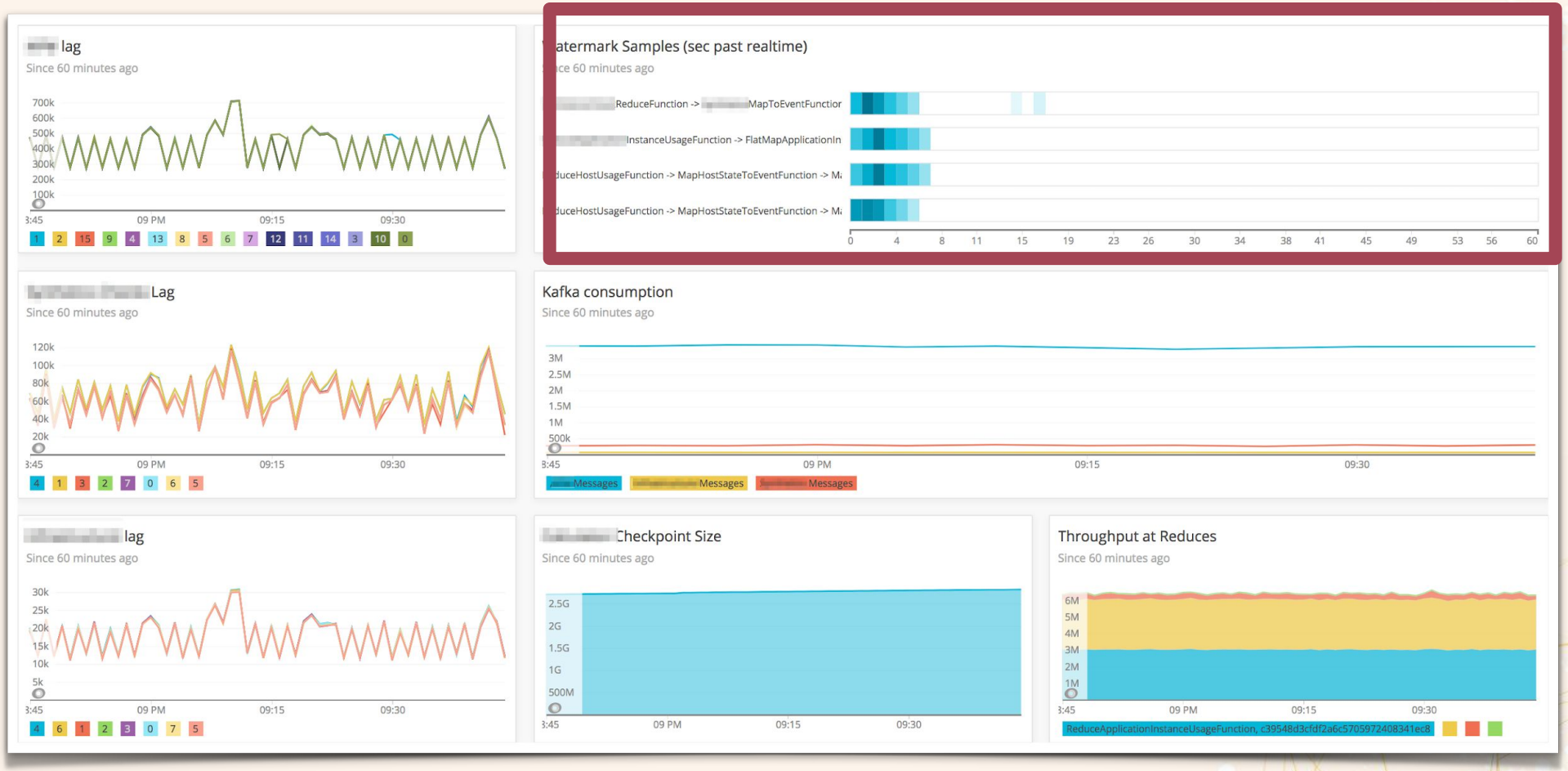

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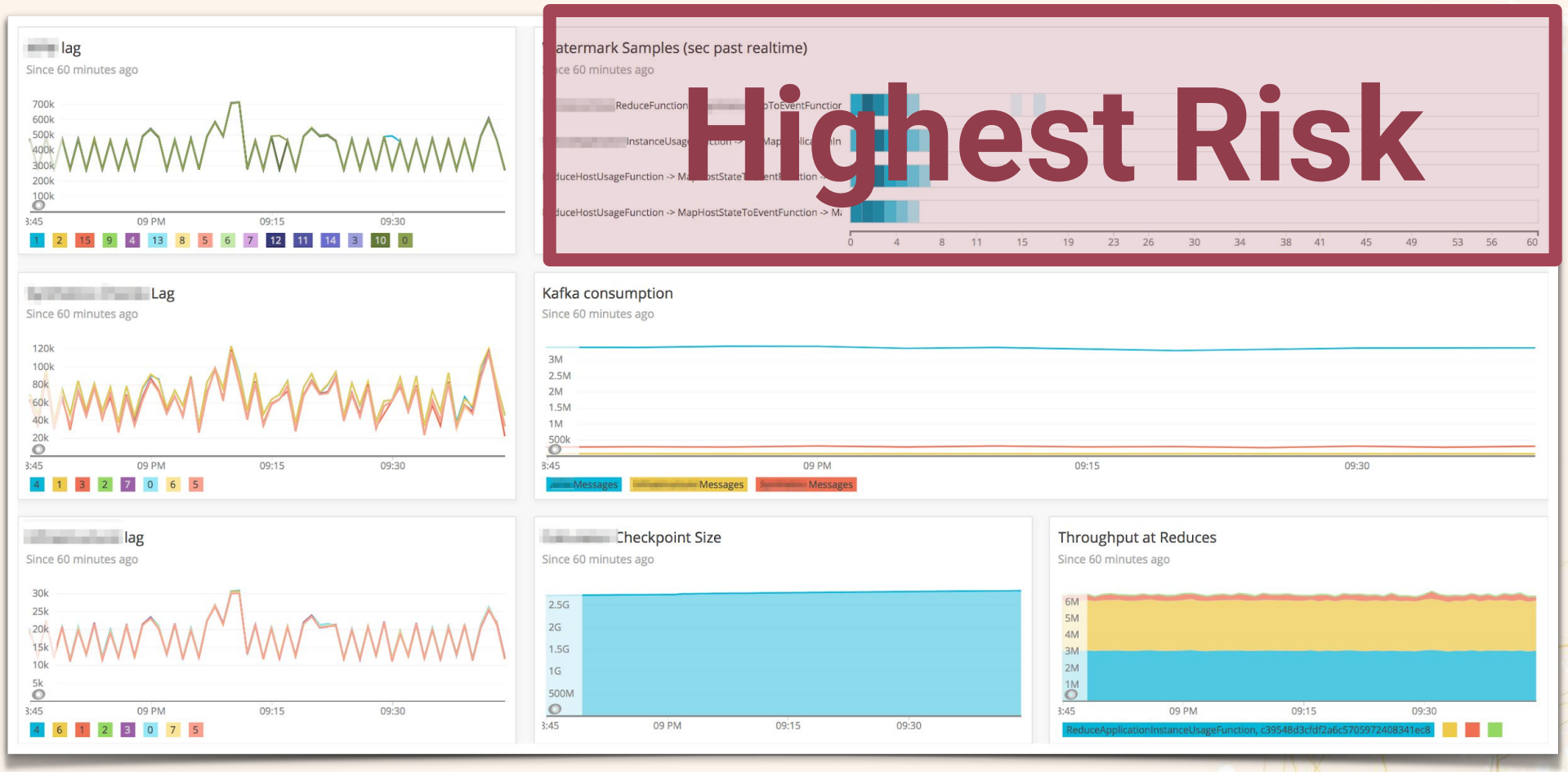

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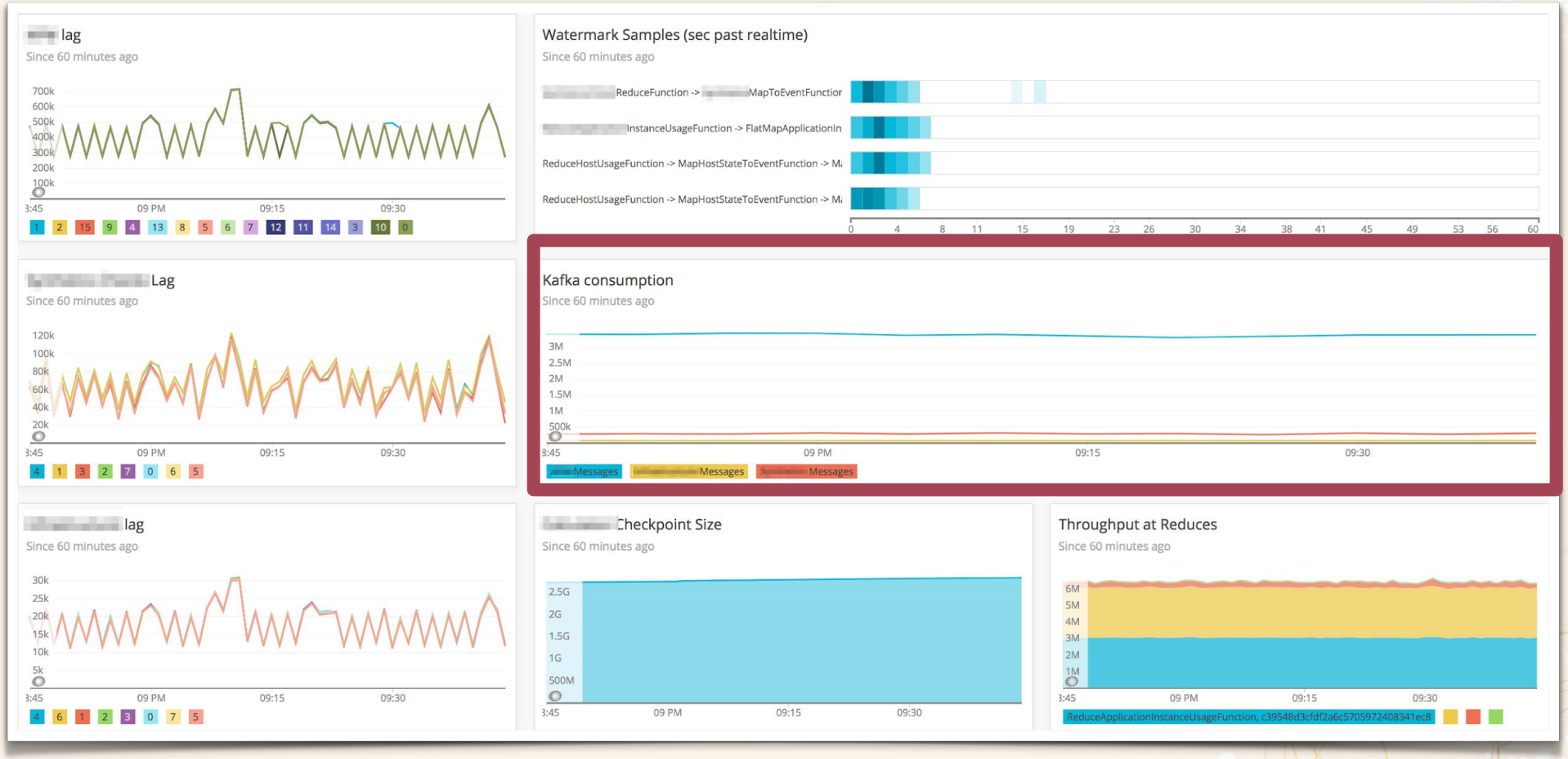

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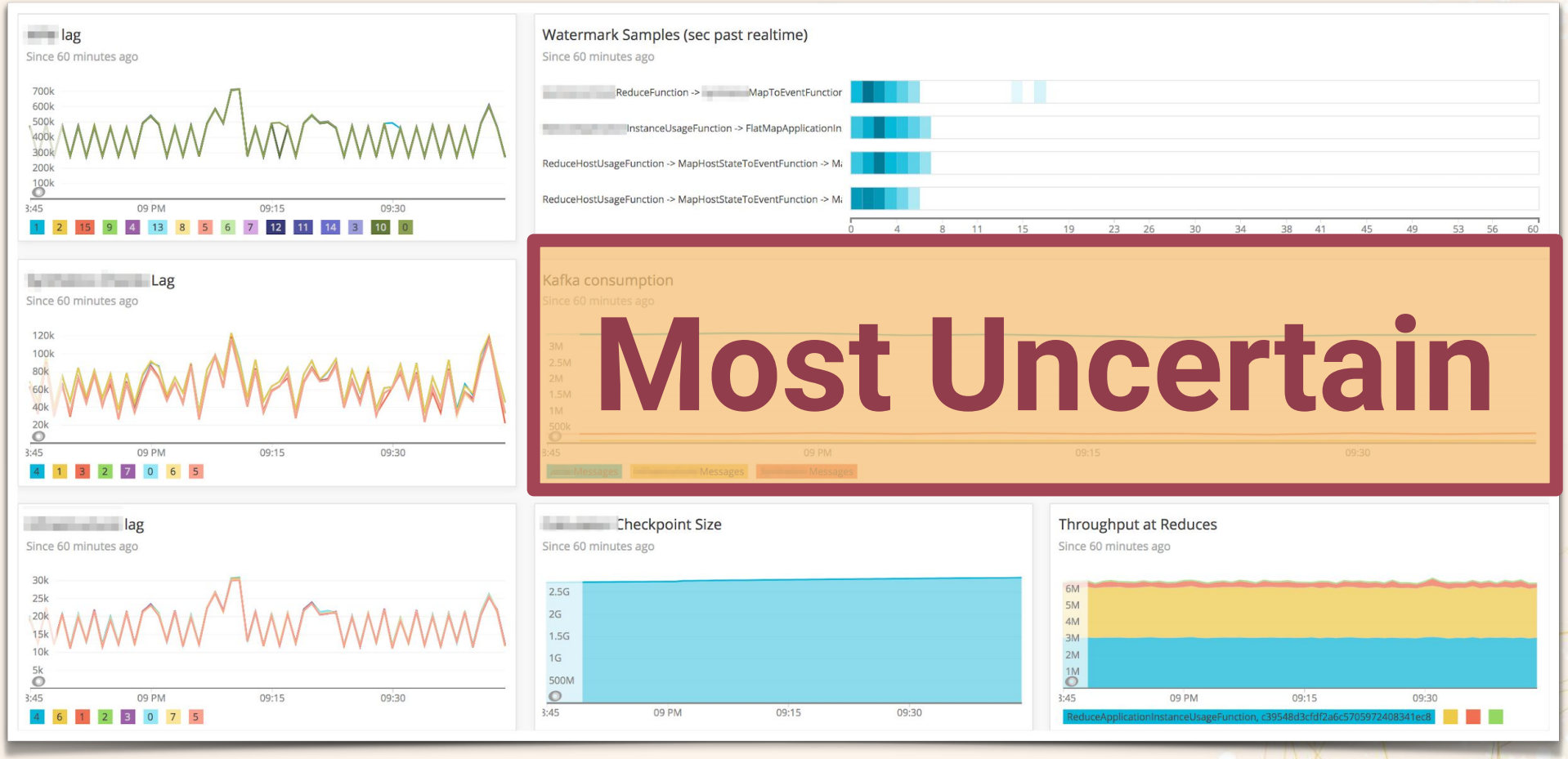

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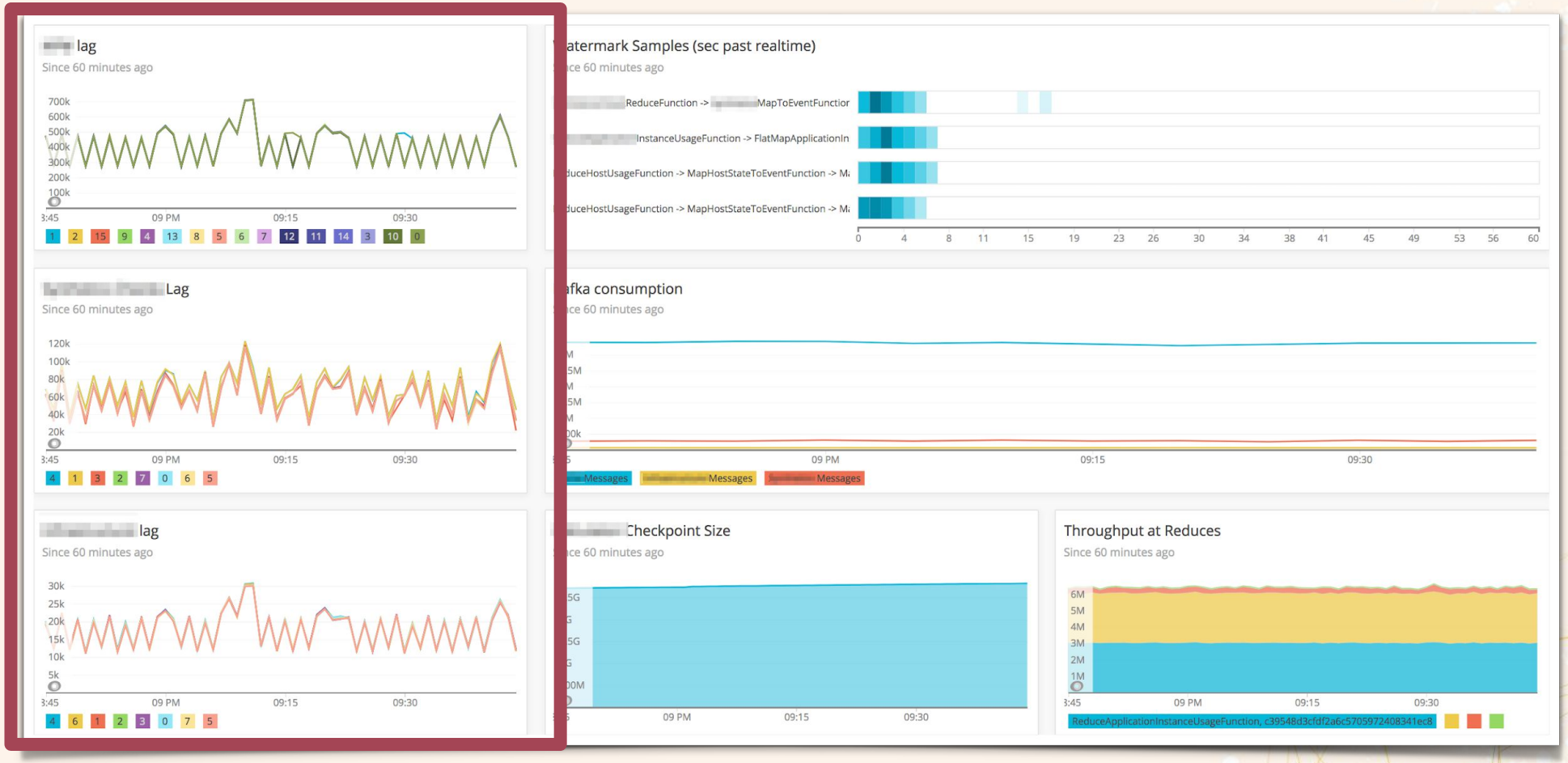

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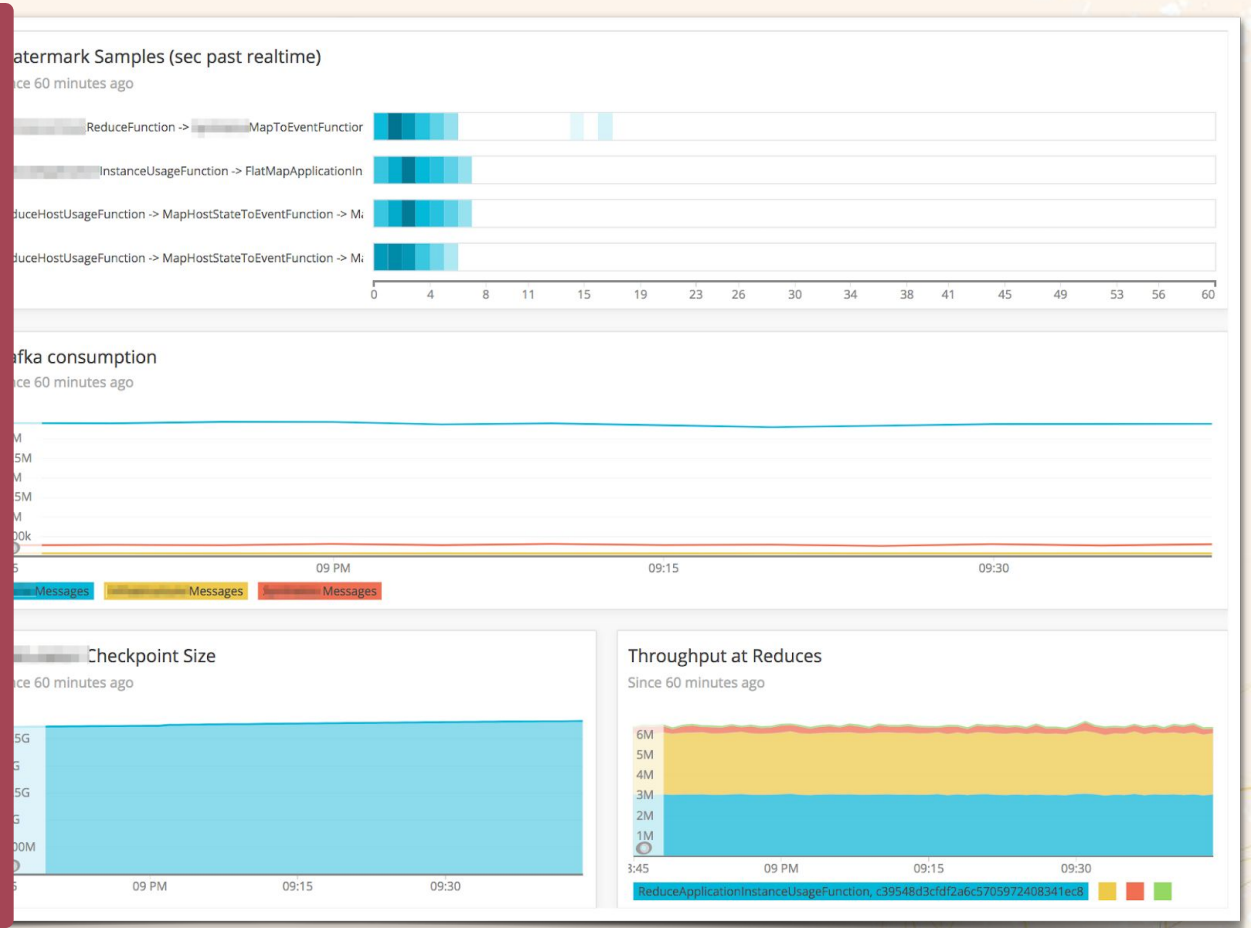
Metrics-Driven Metrics

Current Roadmap Priority



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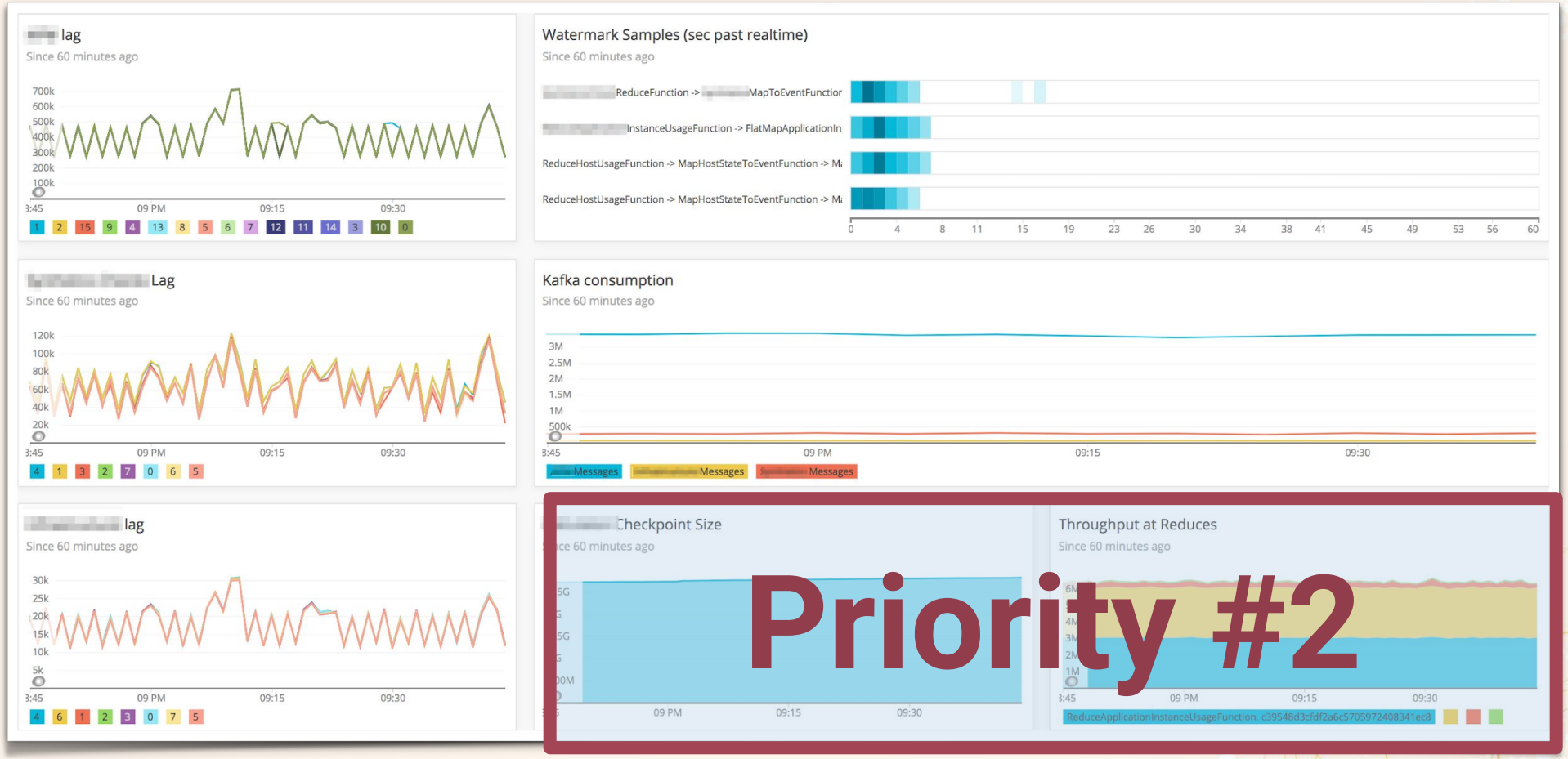

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Metrics-Driven Metrics

Current Roadmap Priority

Highest Risk

Most Uncertain

Priority #2

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Metrics as a Shared Language

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Shared Language

"Even the best metrics driven development fails easily, when it's only built for yourself"

Shared Language

Implementation:

- Identify your impacted groups
- Identify the most effective tools for each group
- Enable automation

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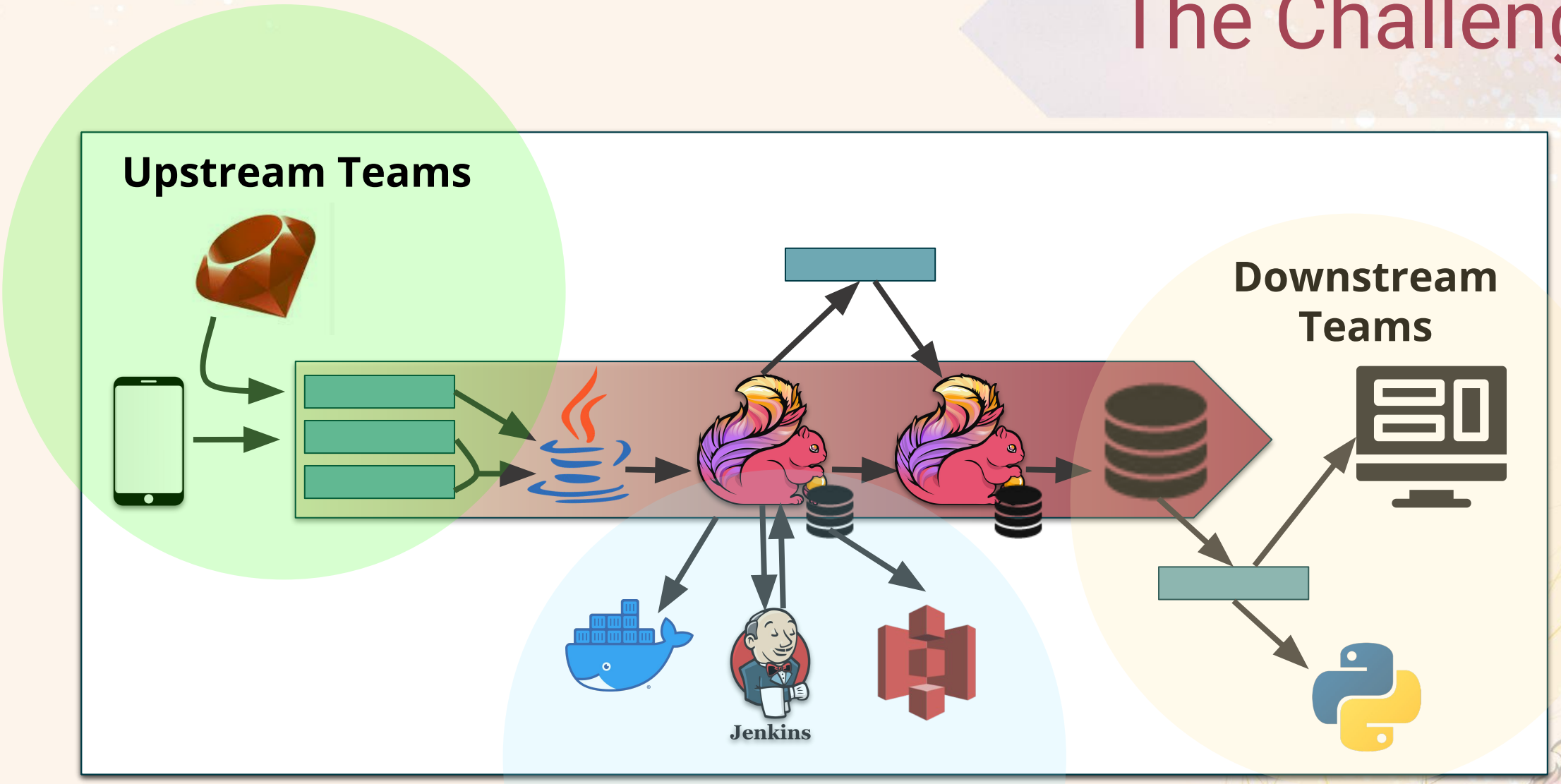
The Challenge



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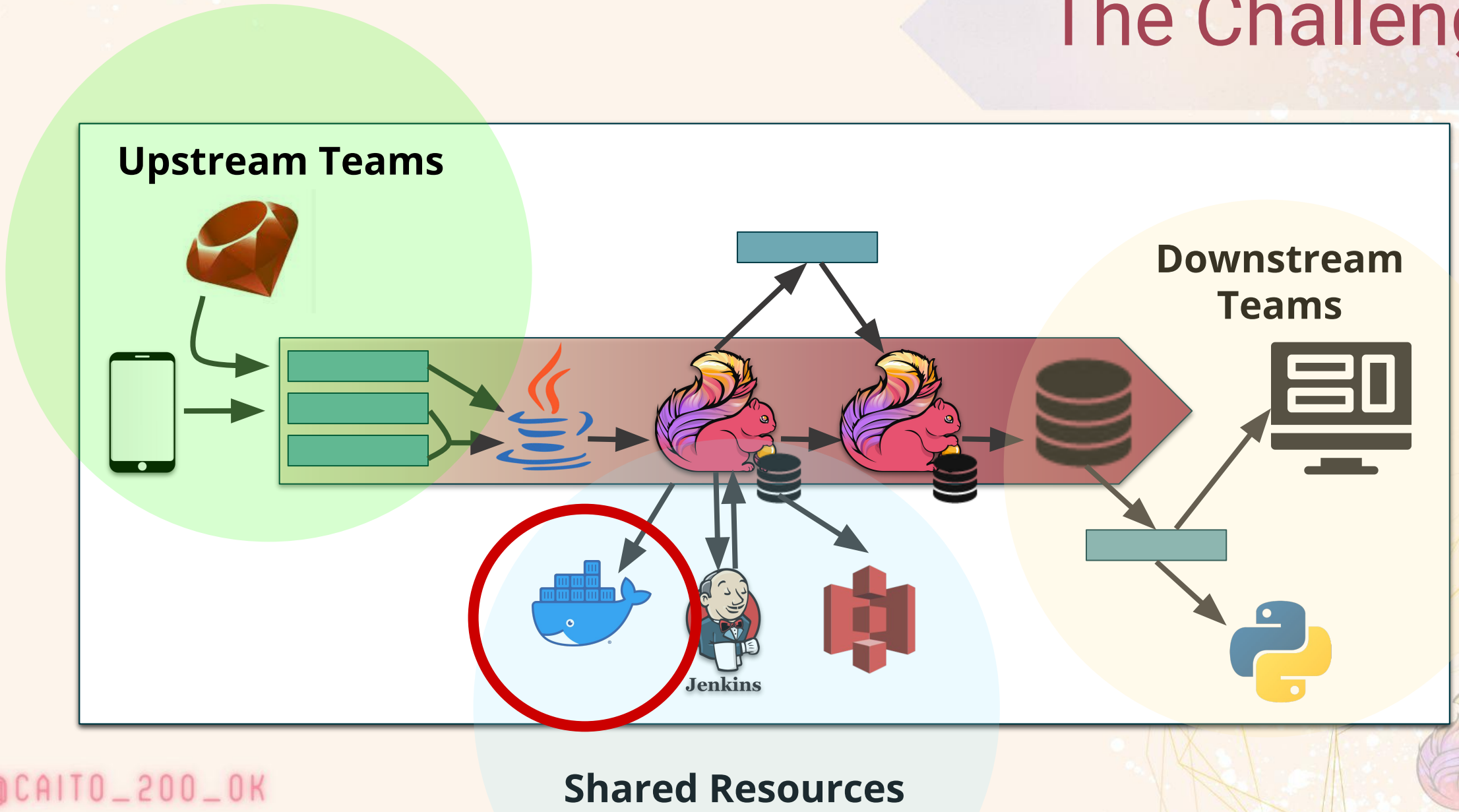

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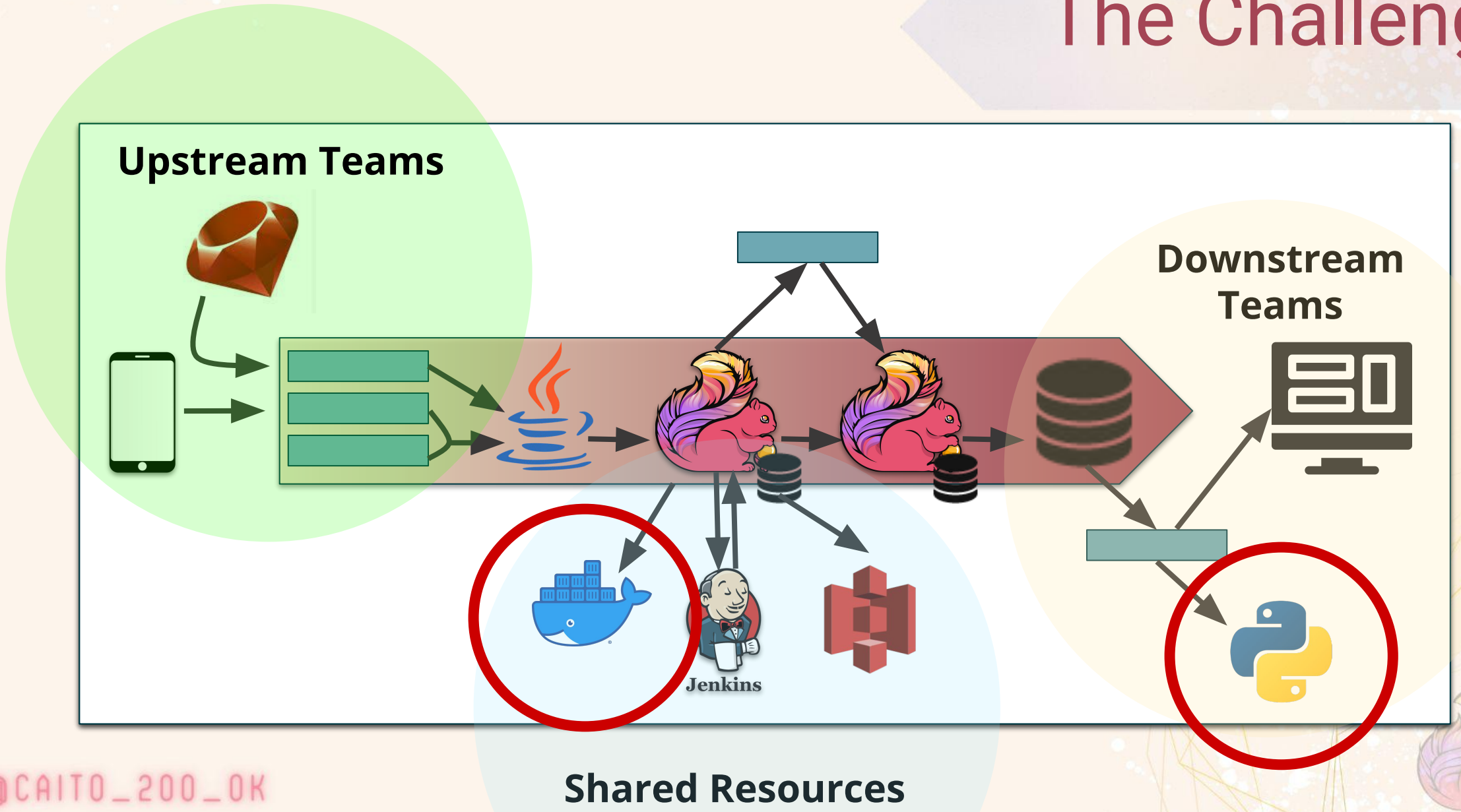

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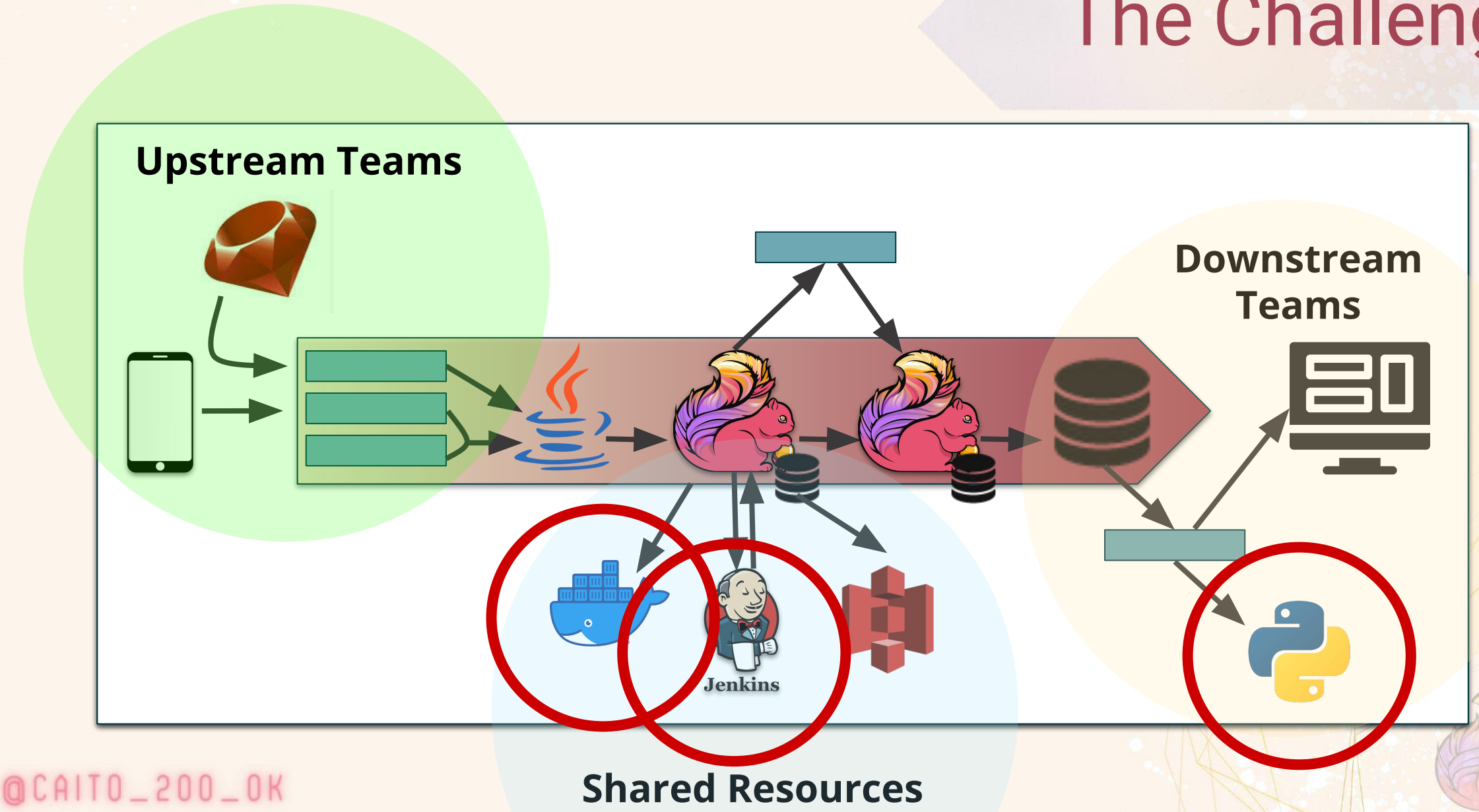

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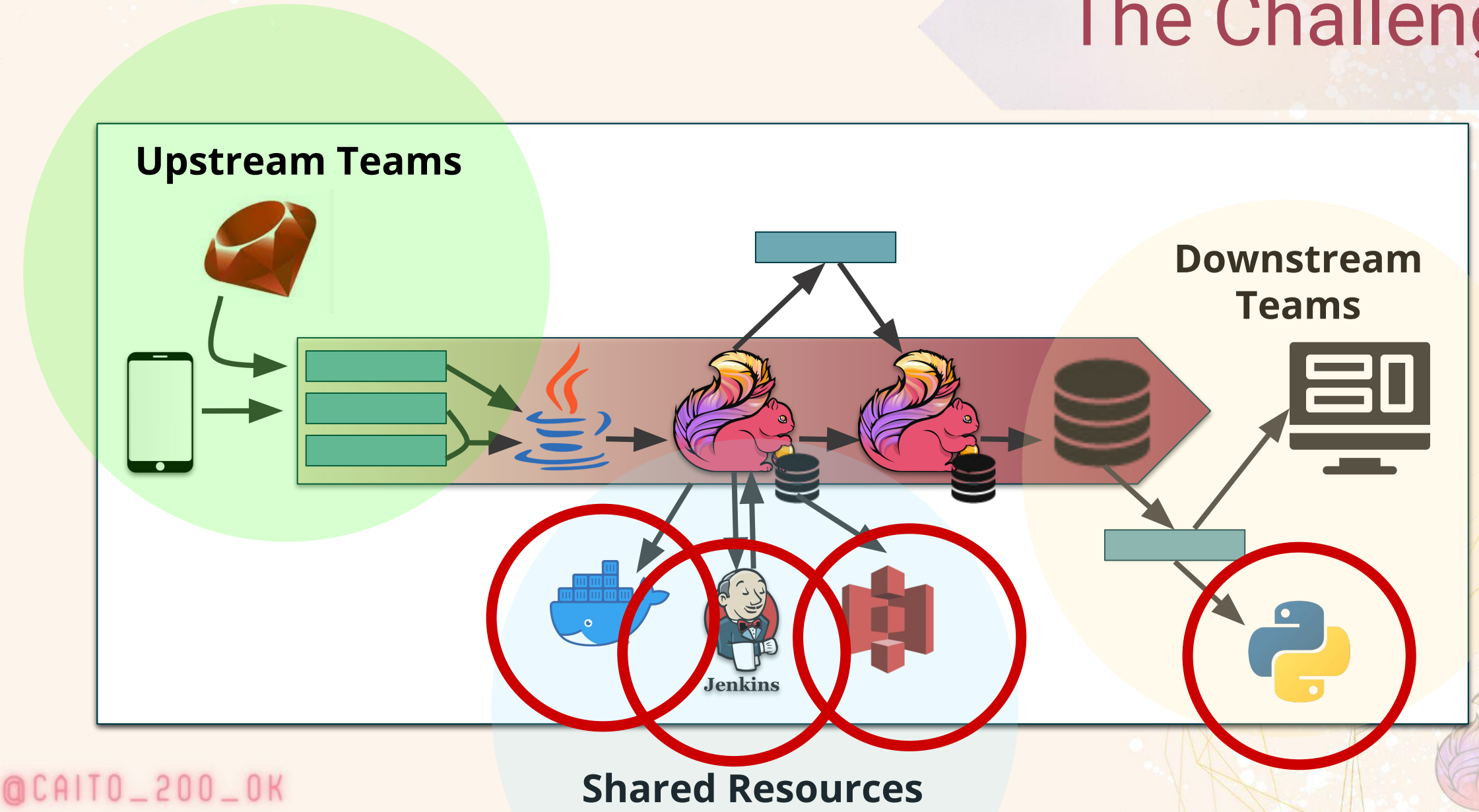

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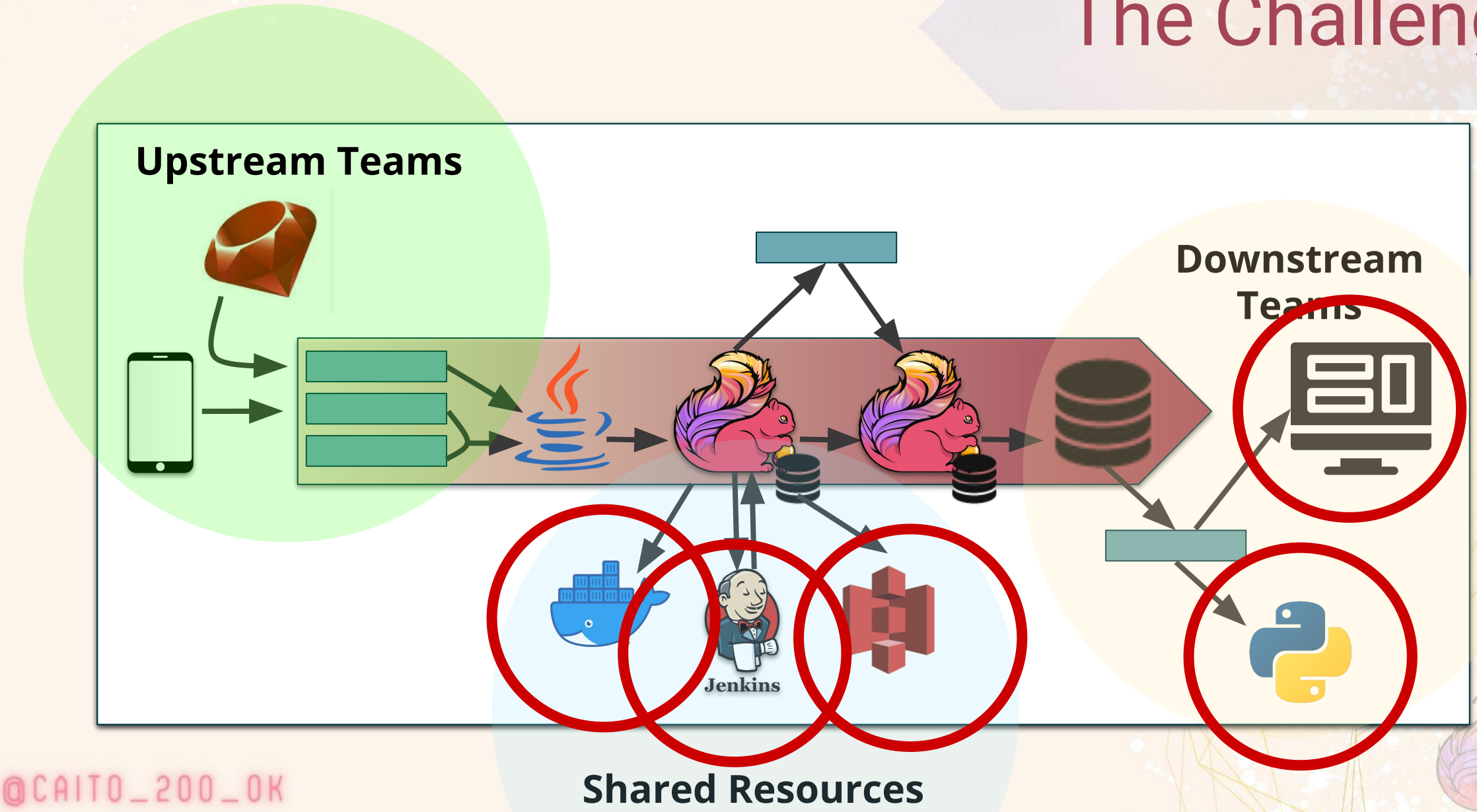

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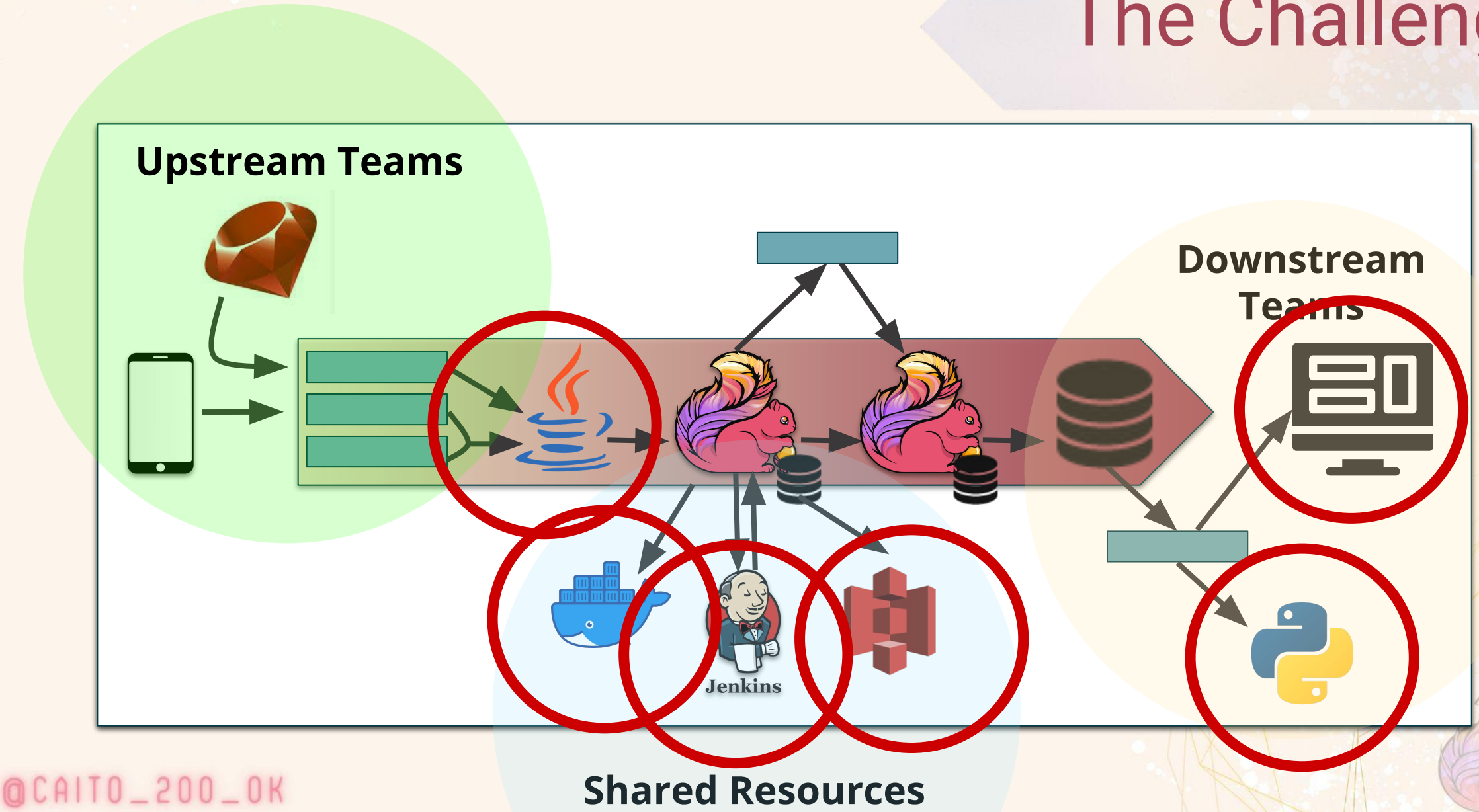

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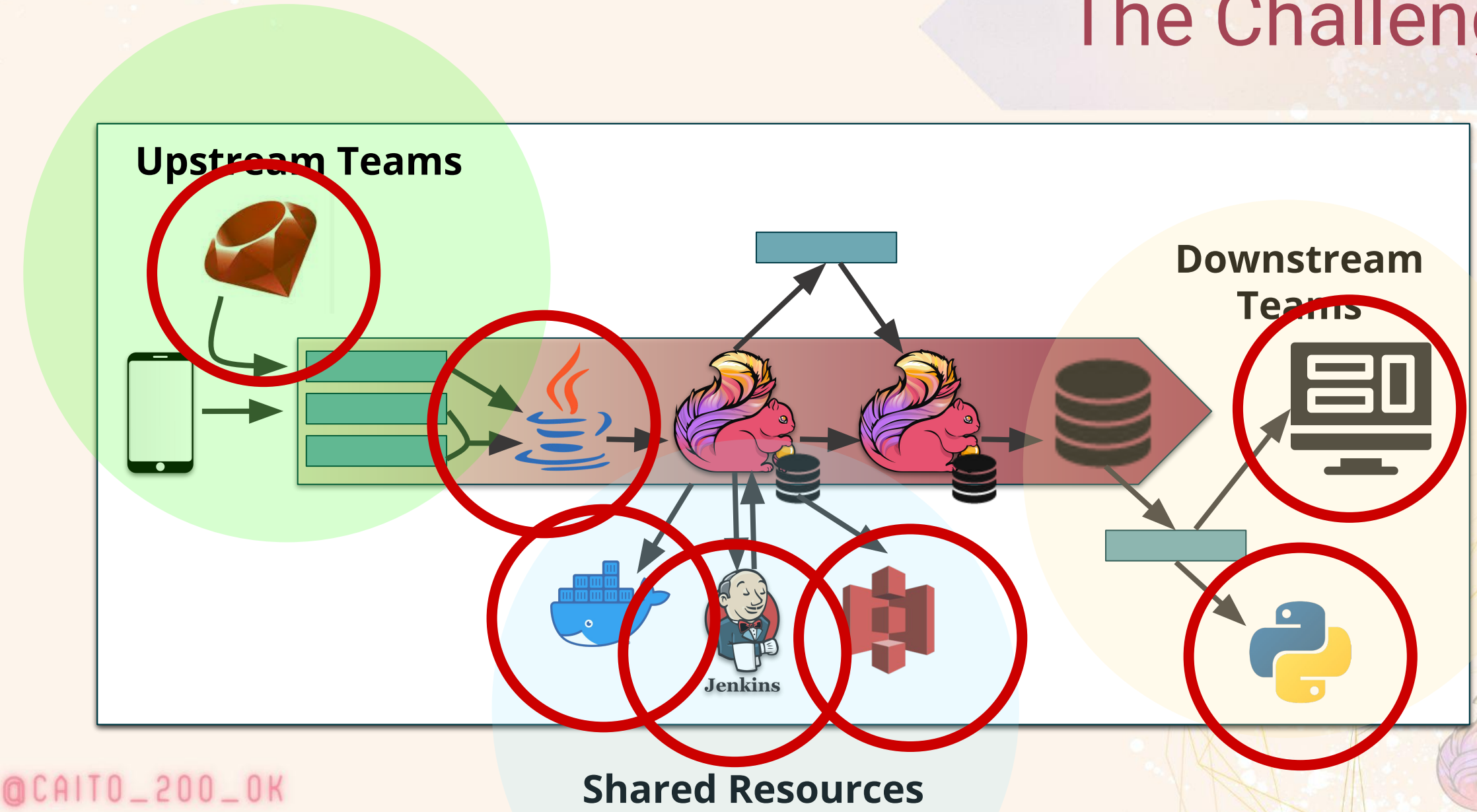

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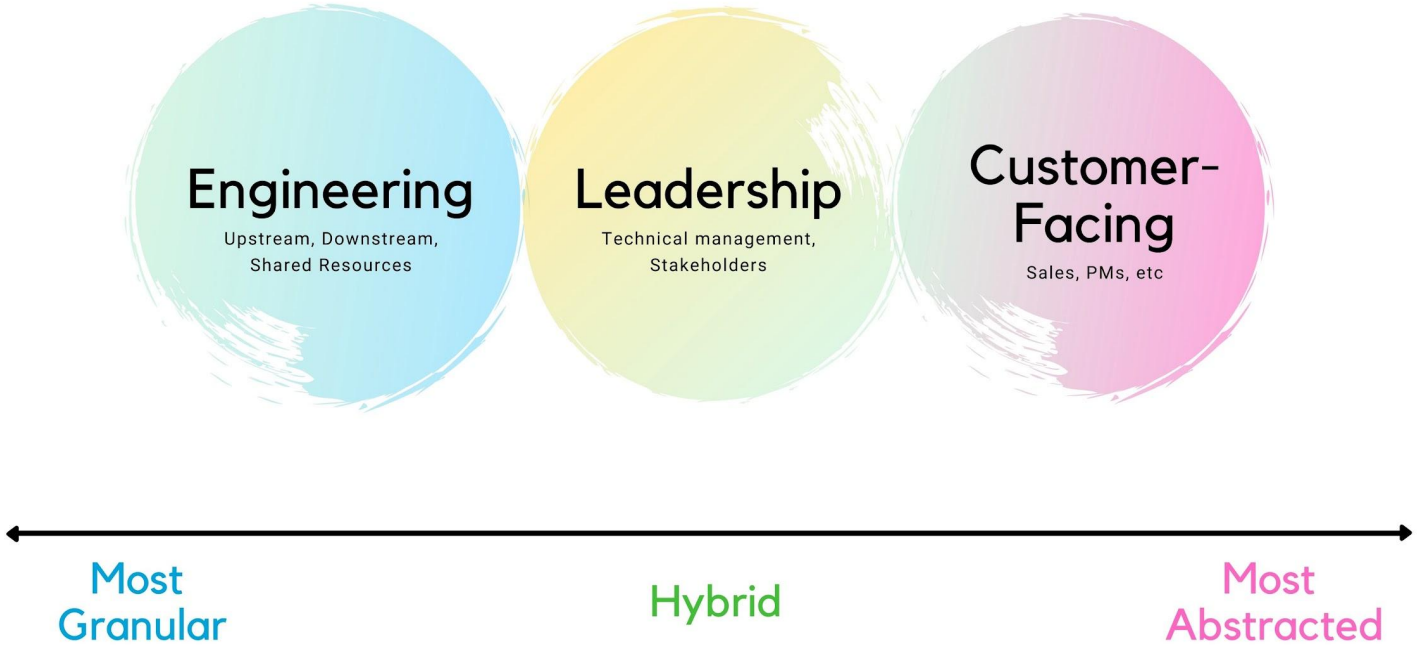
Shared Language



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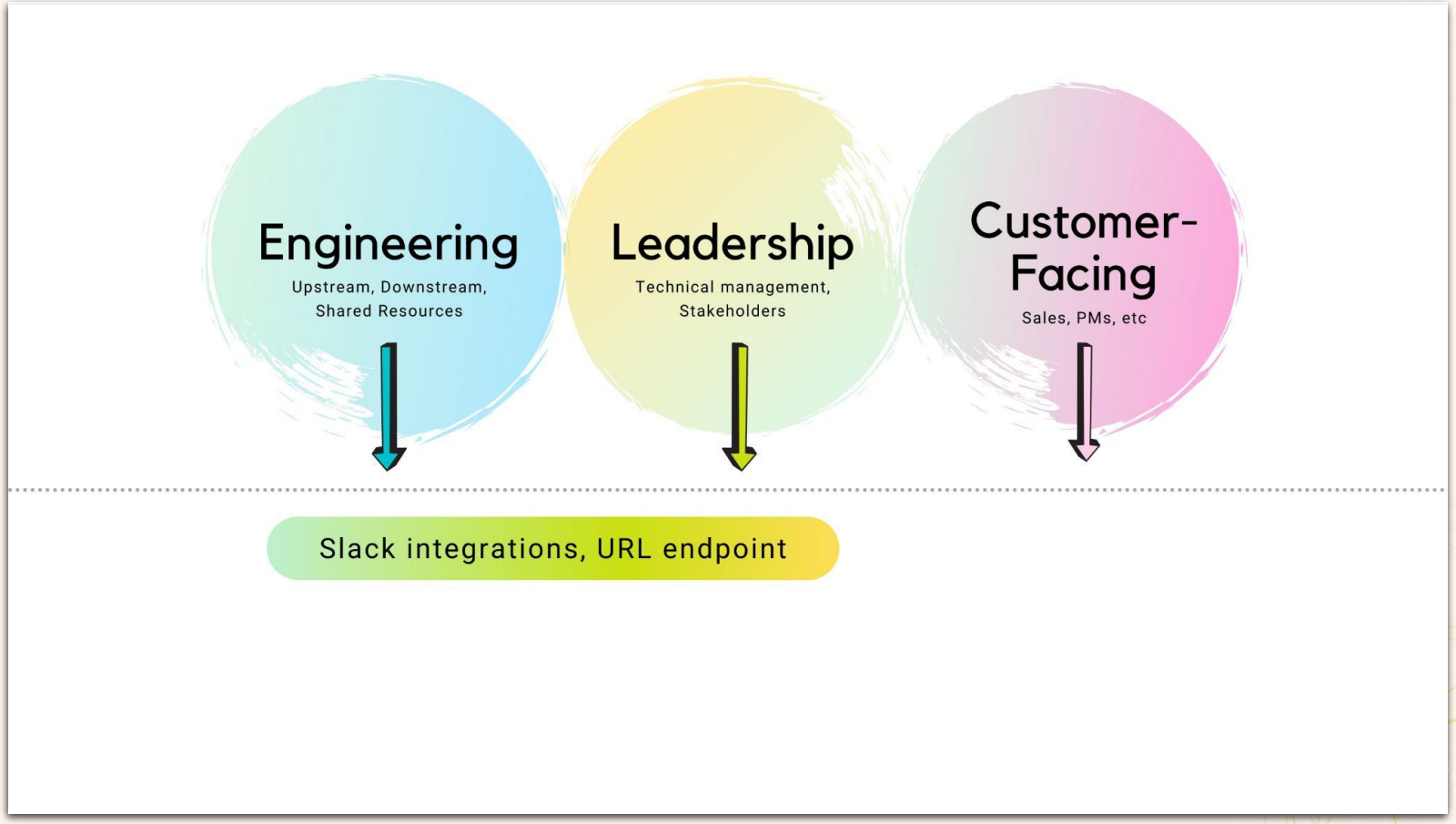

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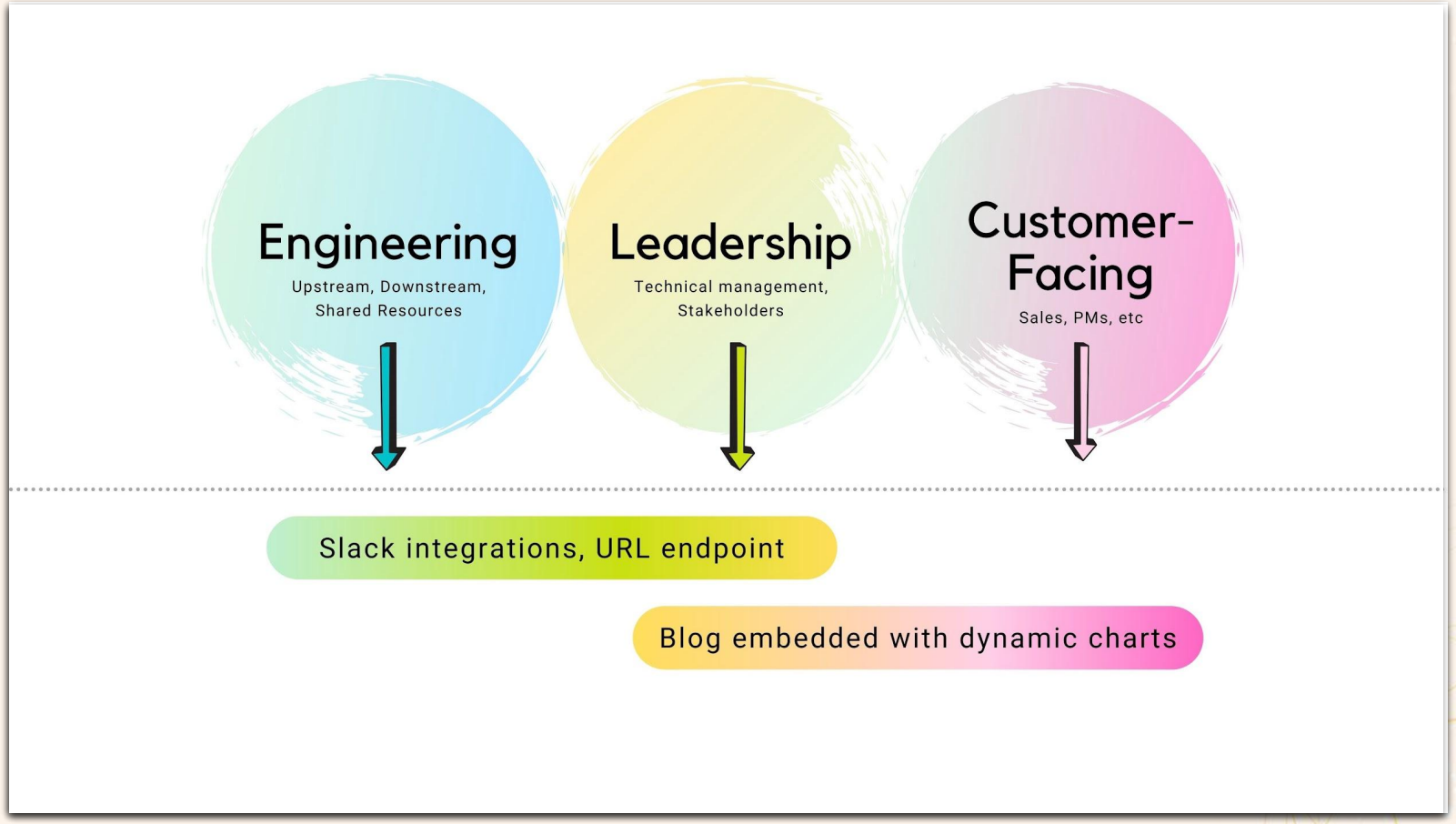

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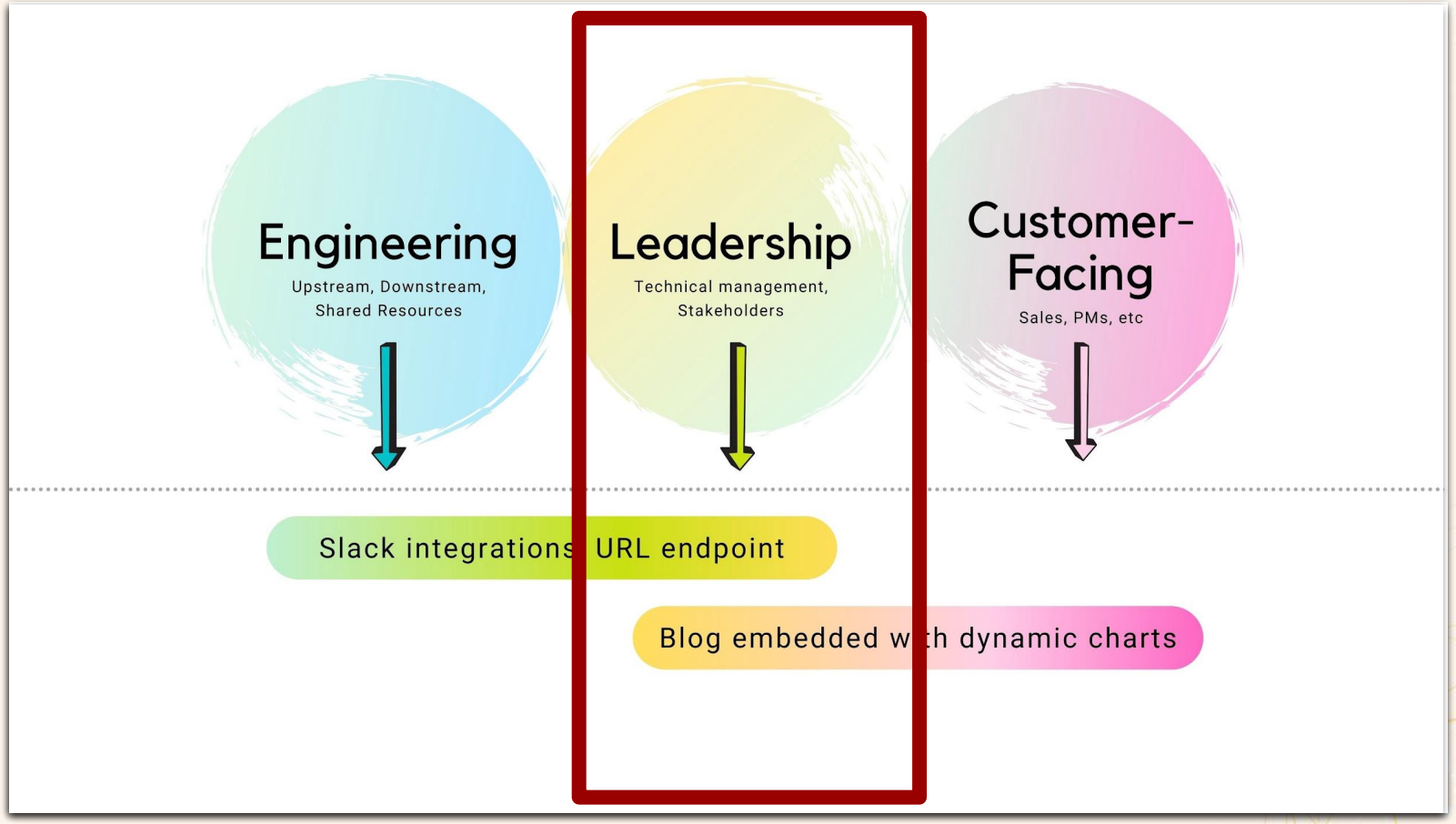

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Conclusion

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Conclusion

For systems with complex integration points:

- **Metrics-Driven Metrics**: streamline technical complexity
- **Metrics as a Shared Language**: streamline interpersonal complications

Contact

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- http://caito-200-ok.com

Upcoming

- Flink Forward 2022
  - August 3, 2022
  - San Francisco

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Thank You!

- **O'Reilly Conference staff!!**
- "Shared Language" photo models:
  - **Zack Hobson**, CTO
  - **Cory Johannsen**, Senior Software Engineer

Quoted Contributors & Reviewers:

- **Mandy Riso** - DevOps Engineer
- **Eric Shamow** - Engineering Manager
- **Mike Hix** - Senior Software Engineer
- **Ben Ford** - Product Manager
- **Noçnica Fee** - Developer Advocate
- **Lucy Wyman** - Senior Software Engineer
- **Logan Ballard** - Site Reliability Engineer

Resources

- Prometheus push gateway - when to use it/documentation: https://prometheus.io/docs/practices/pushing/
- Prometheus push gateway on GitHub: https://github.com/prometheus/pushgateway
- Prometheus Flink example: https://github.com/mbode/flink-prometheus-example
- Flink monitoring: https://flink.apache.org/news/2019/02/25/monitoring-best-practices.html

Credits - Images

- Flink logos:
  https://wints.github.io/flink-web//community.html
- Data-Driven/Aware/Informed Design:
  https://uxdesign.cc/becoming-a-data-aware-designer-1d7614ebc3ed
- Stream processing diagram:
  https://www.ververica.com/what-is-stream-processing
- 747 Airplane cockpit:
  https://www.reddit.com/r/pics/comments/5vv8qt/the_pilots_seat_and_cockpit_of_a_boeing_747/
- DataDog Flink dashboard:
  https://www.datadoghq.com/blog/monitor-apache-flink-with-datadog/
- All other photos & Images:
  Caito Scherr

Credits

- Basic Data-Driven Development principles https://www.portable.com.au/reports/principles-of-data-driven-design
- Data-driven design: https://www.springboard.com/blog/data-driven-design/
- Becoming A Data-Aware Designer, + definition image - Illustration from “Designing with Data” by King, Churchill, & Tan https://uxdesign.cc/becoming-a-data-aware-designer-1d7614ebc3ed
- https://digitalprinciples.org/wp-content/uploads/PDD_Principle-BeDataDriven_v2.pdf
- Harvard Business Review - Data Driven Culture: https://hbr.org/2020/02/10-steps-to-creating-a-data-driven-culture