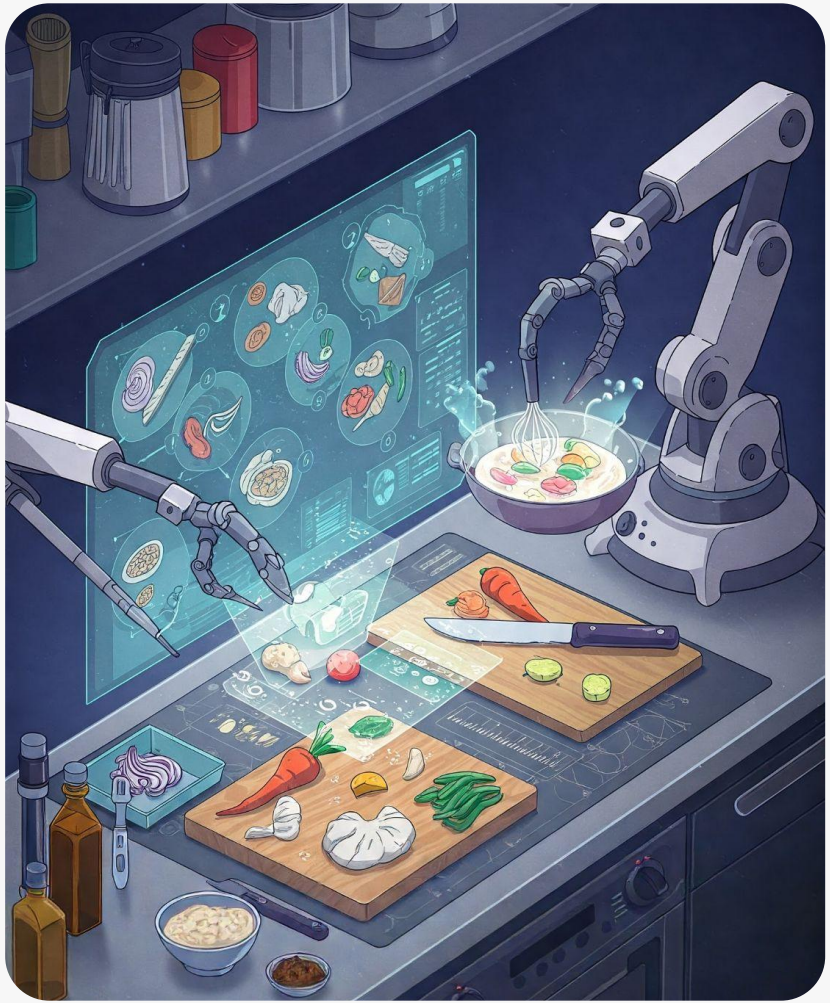
✨ Async Pipeline Secret Sauce ✨

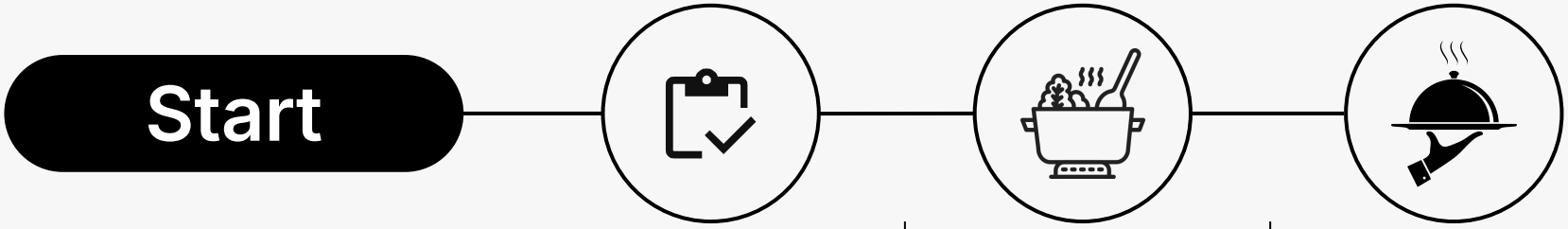
Beyond Sequential:

A Recipe for Async Pipeline Observability and Alerting

Jash Mistry, Gabriela Medvetska



Agenda



PREPARE INGREDIENTS

Gather your metrics

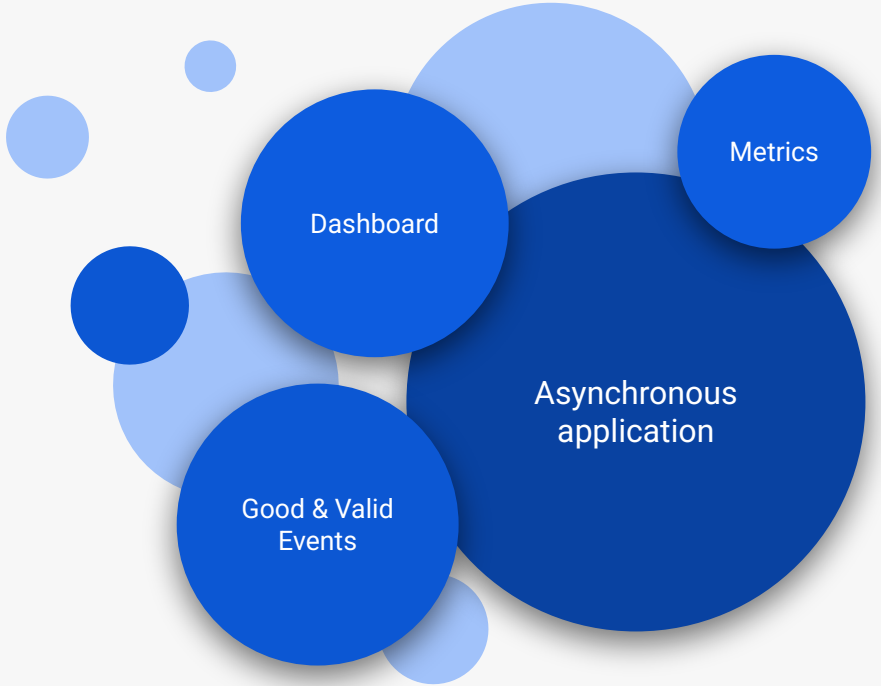
BOIL ‘EM MASH ‘EM

Create SLOs and dashboards

GARNISH & SERVE

Maintain coverage and compliance

Prepare Ingredients



What Makes an Application Asynchronous?

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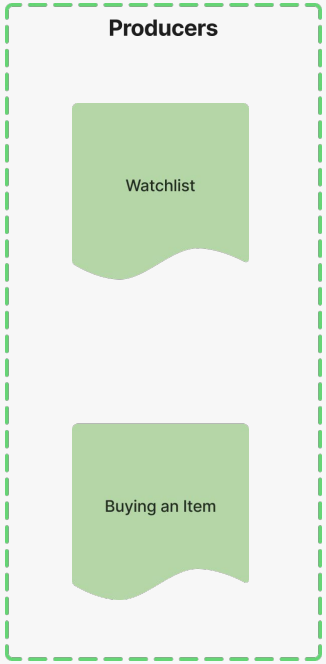

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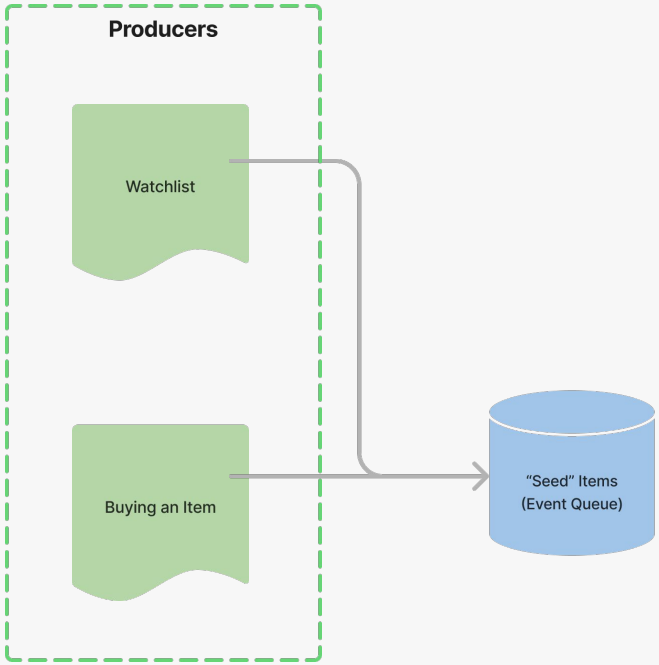

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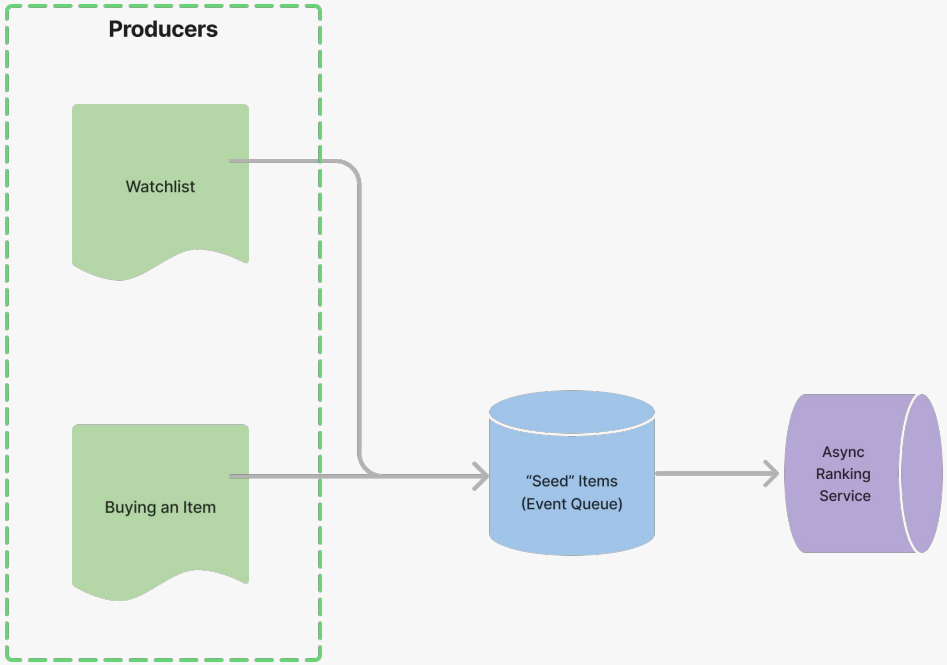

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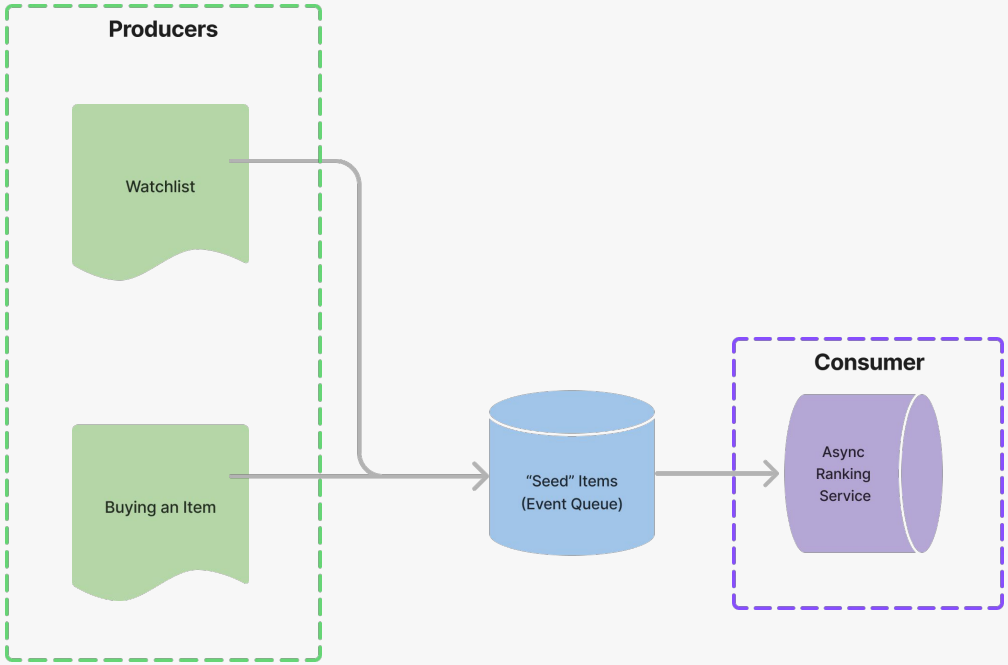

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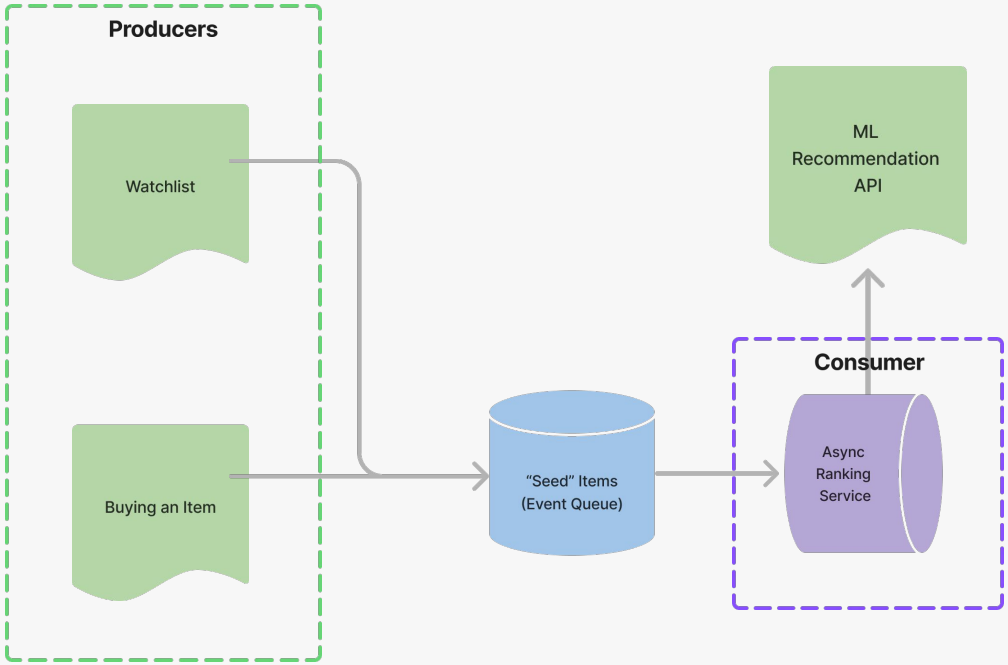

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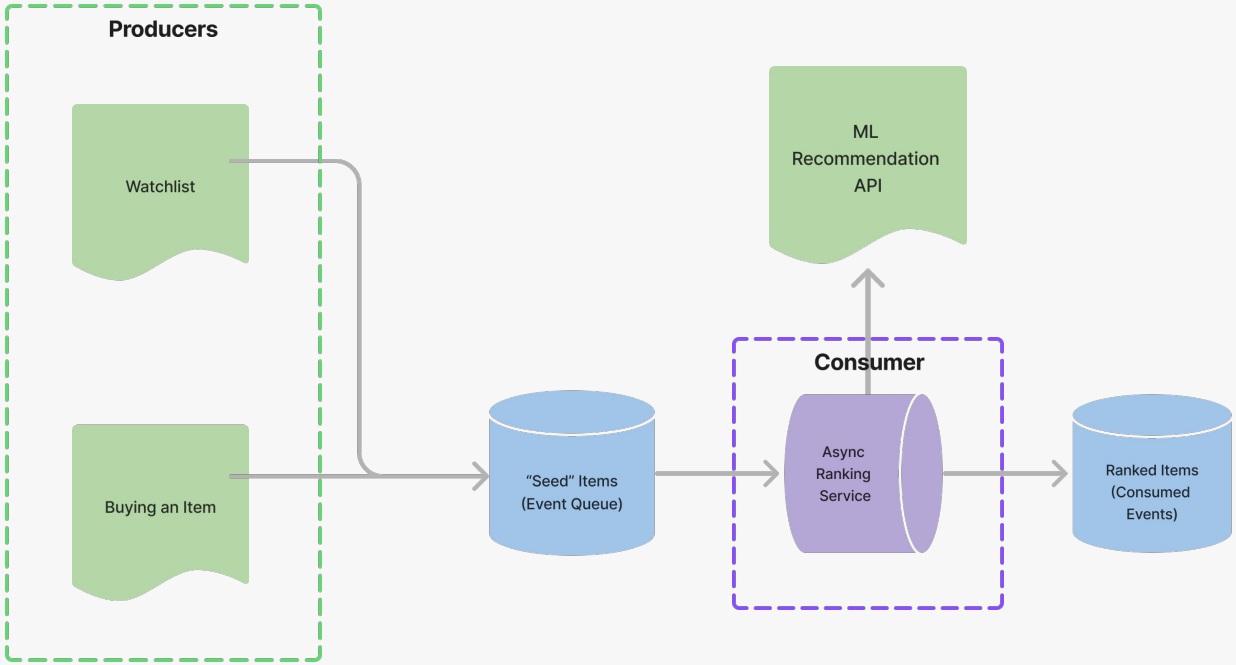

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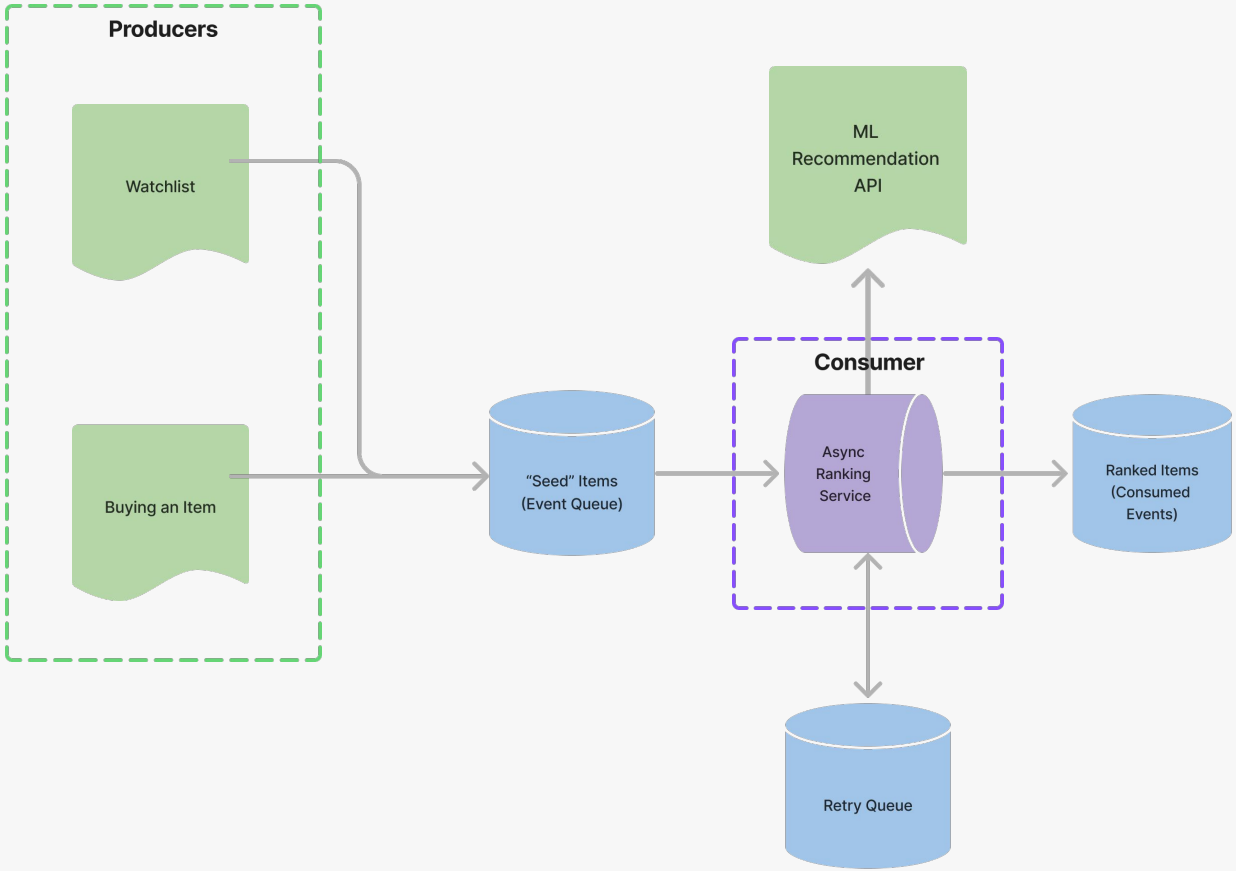

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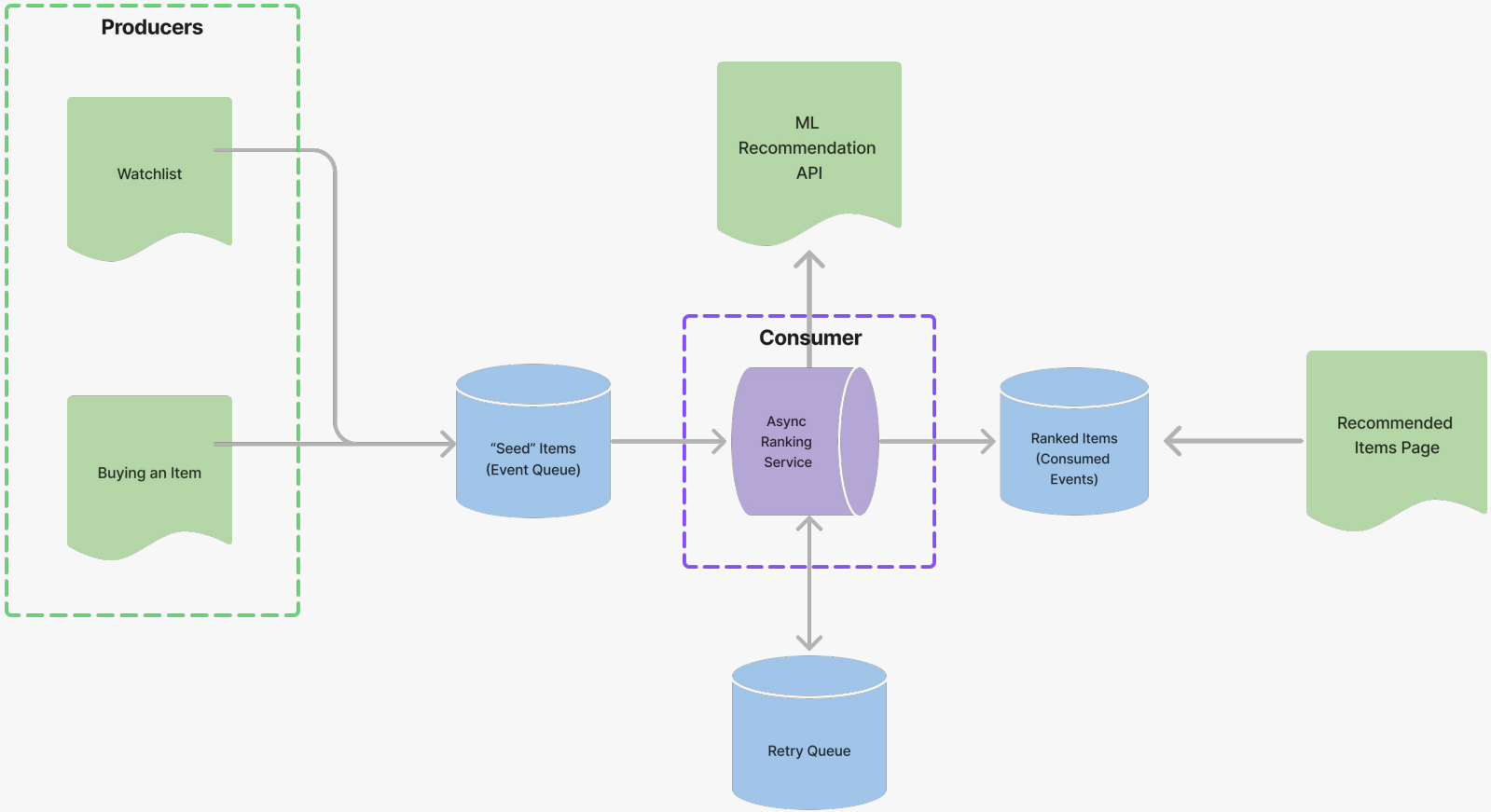

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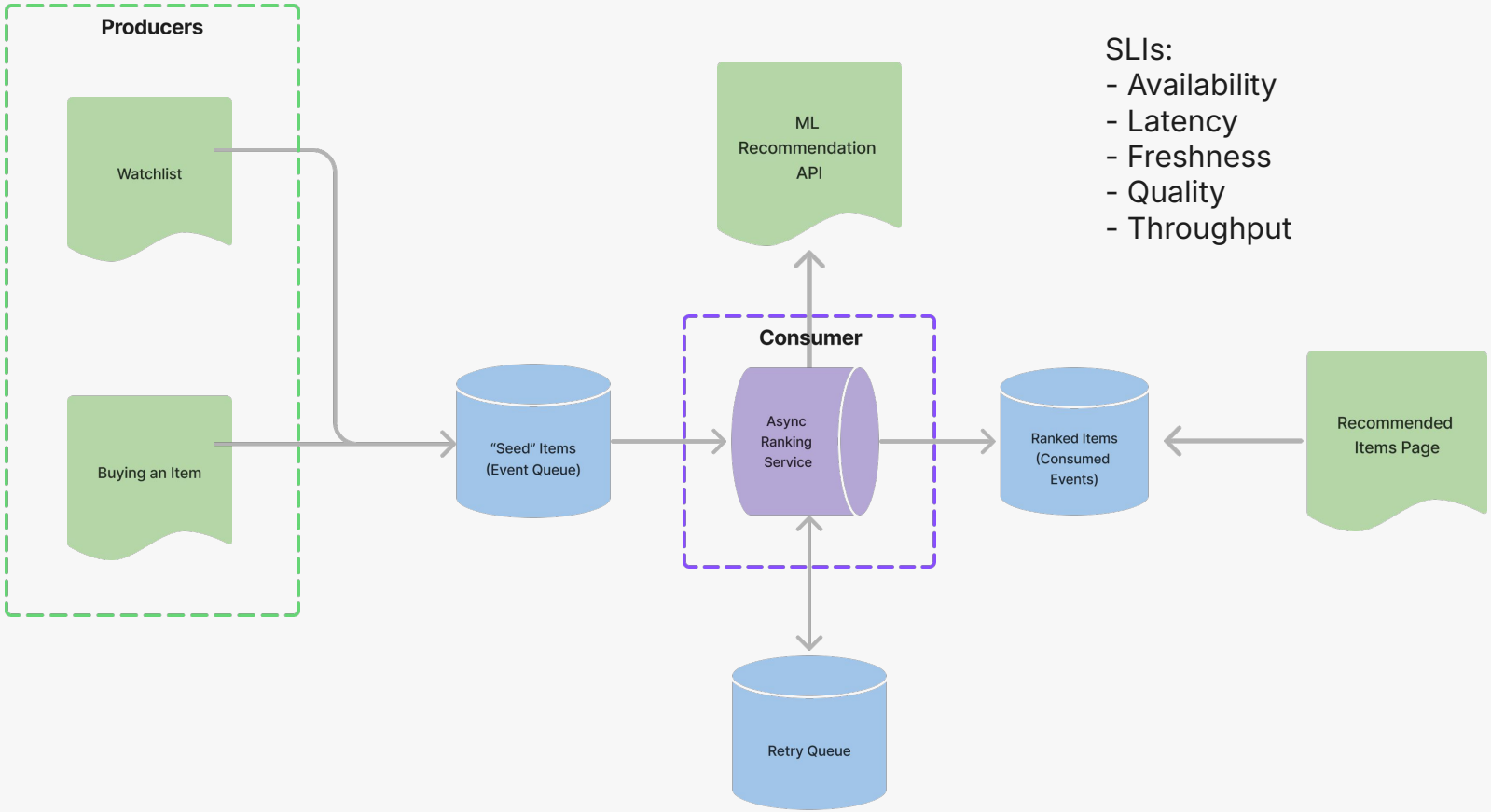
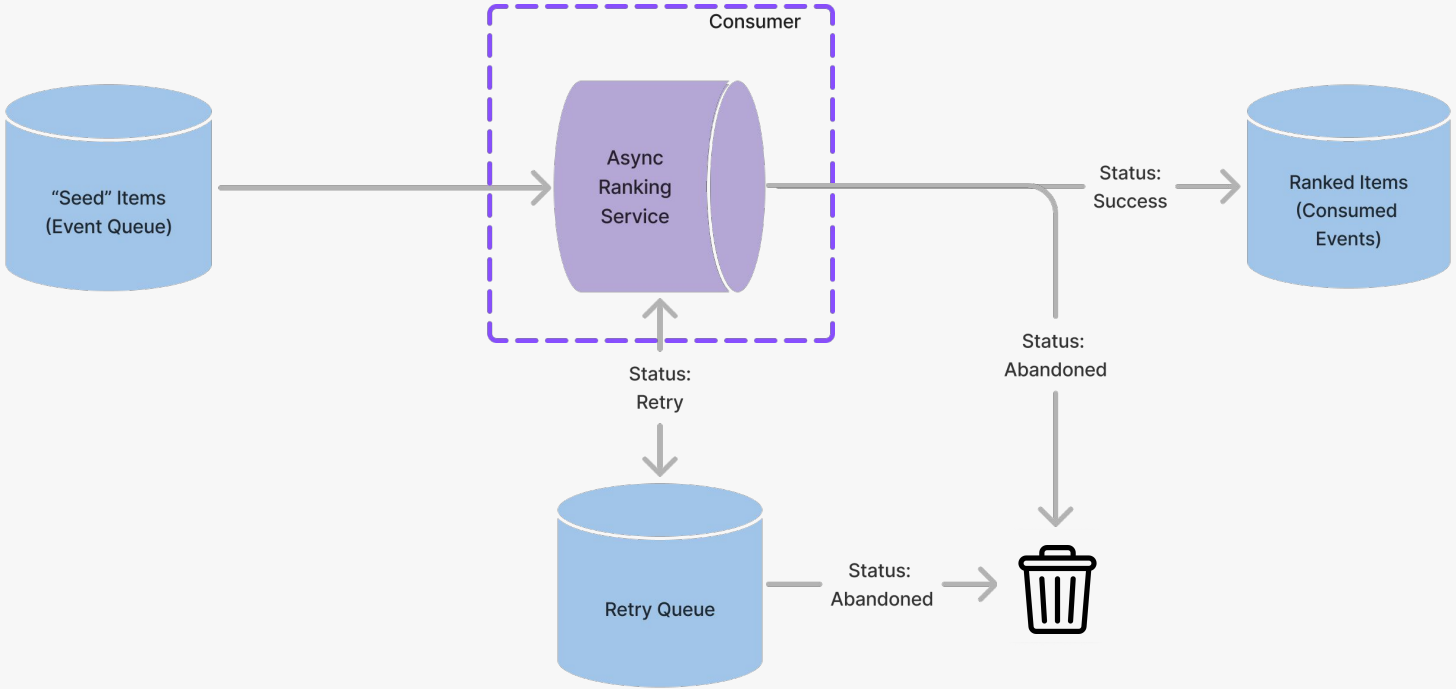


SLIs:
- Availability
- Latency
- Freshness
- Quality
- Throughput

Availability Metric



Availability Service Level Objective (SLI)

Number of successful events per second

```
sum(rate(consumed_item_count{consumer_name="RankingConsumer",
event_name="RANK.SEED.ITEM",status="SUCCESS"}[5m]))
```

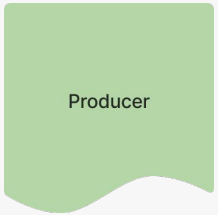
Number of total events per second

```
sum(rate(consumed_item_count{consumer_name="RankingConsumer",
event_name="RANK.SEED.ITEM",status="SUCCESS|ABANDONED"}[5m]))
```

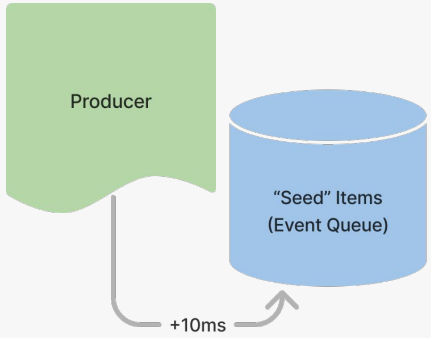
SLI formula:

$$\text{SLI} = \left(\frac{\text{Good Events}}{\text{Valid Events}} \right) \times 100\%$$

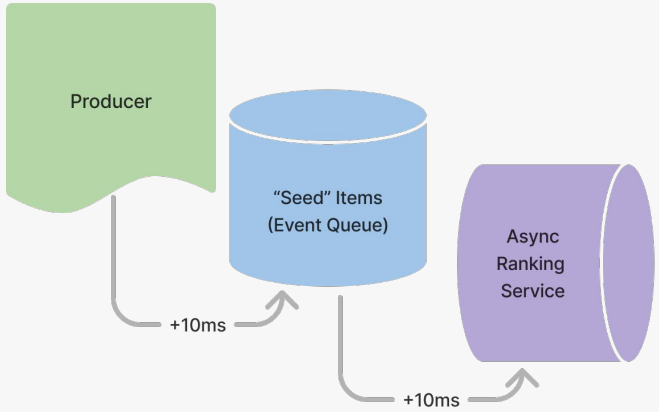
Latency Metric



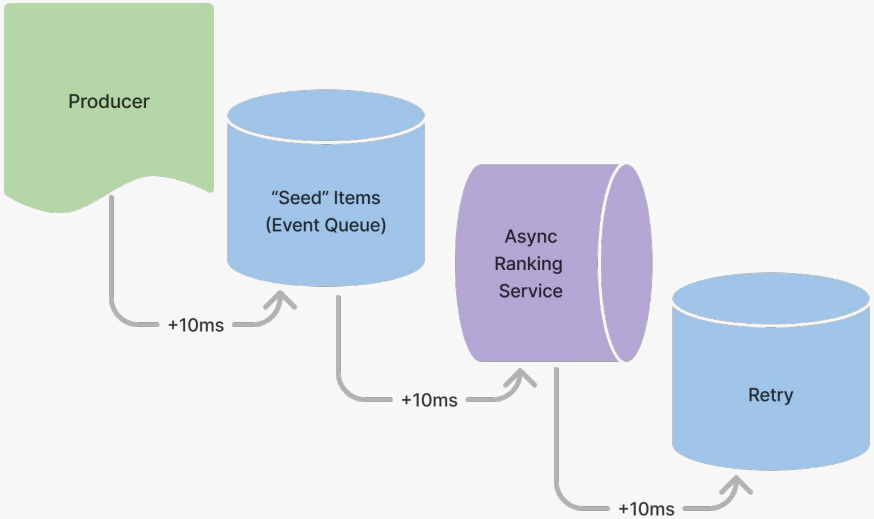
Latency Metric



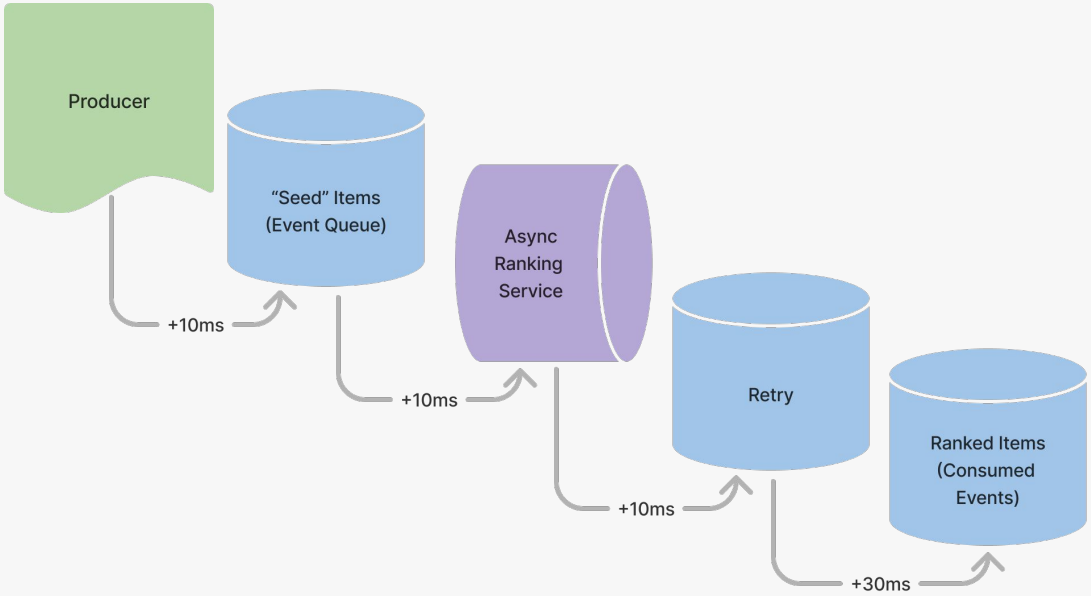
Latency Metric



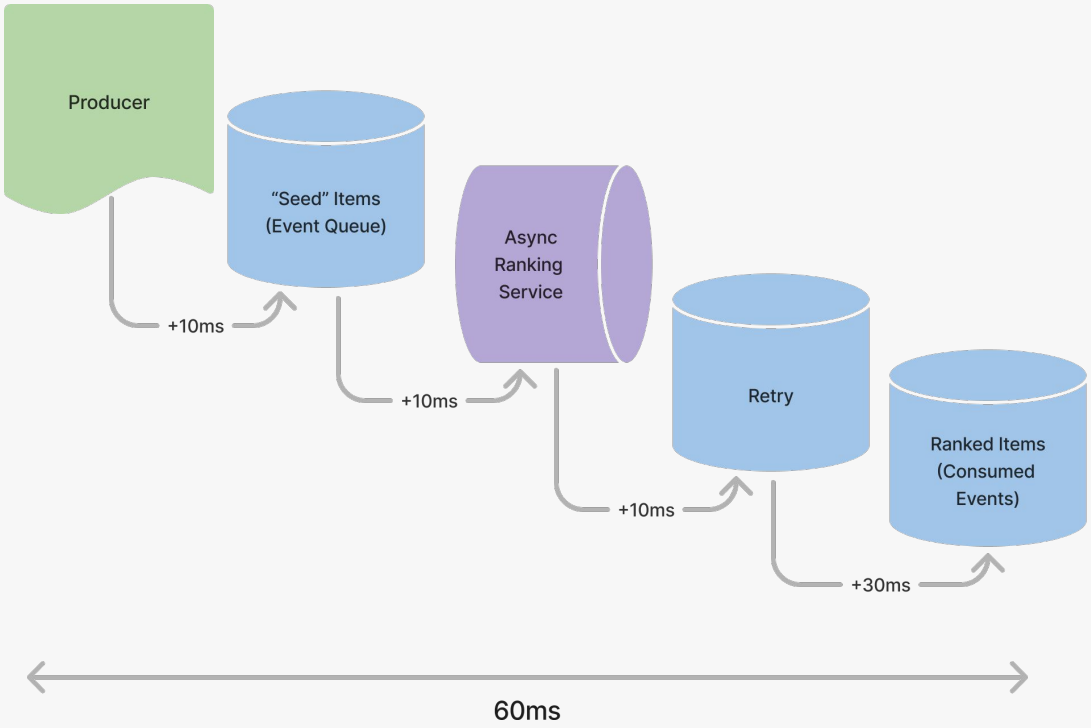
Latency Metric



Latency Metric



Latency Metric



Latency Service Level Objective (SLI)

Number of successful events per second

```
sum(rate(consumed_item_count{consumer_name="RankingConsumer",
event_name="RANK.SEED.ITEM", le="10000"}[5m]))
```

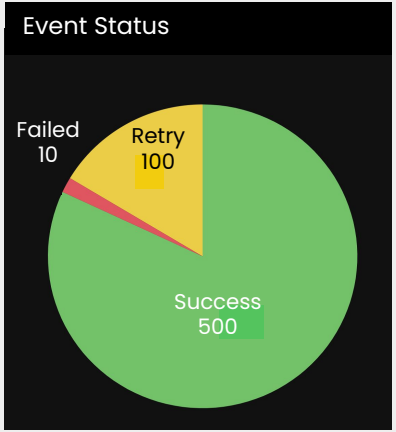
Number of total events per second

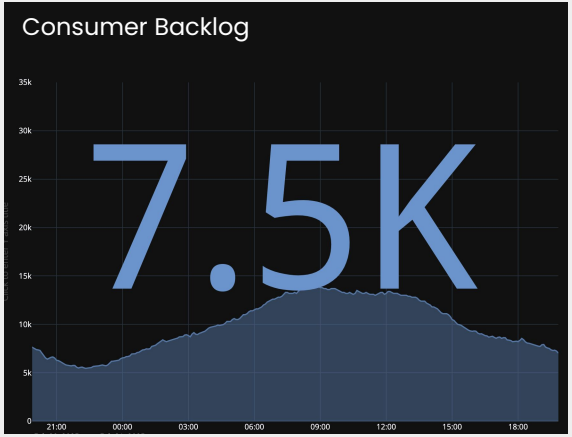
```
sum(rate(consumed_item_count{consumer_name="RankingConsumer",
event_name="RANK.SEED.ITEM", le="+Inf"}[5m]))
```

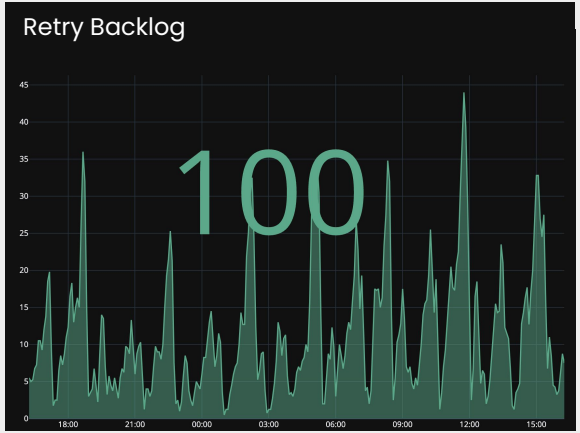
SLI formula:

$$\text{SLI} = \left(\frac{\text{Good Events}}{\text{Valid Events}} \right) \times 100\%$$

Metrics Must Flow







We are the whisk takers

Cre8tiveSVGDesigns. *Pastry Chef Svg*. Etsy. https://www.etsy.com/listing/1257629580/pastry-chef-svg-if-theres-a-whisk-theres

Let your SLOs handle the heavy whisking

SLO - Service Level Objective - is an internal promise to meet customer expectations.

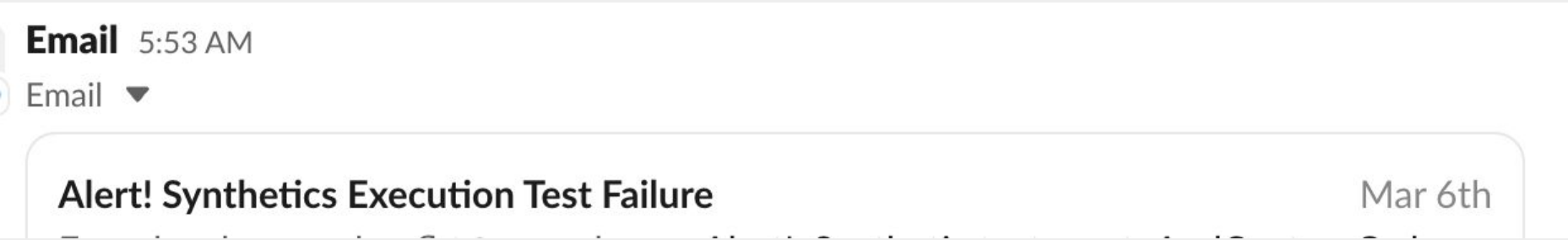
An **SLO** sets the target of an **SLI** - Service Level Indicator - over a period of time.

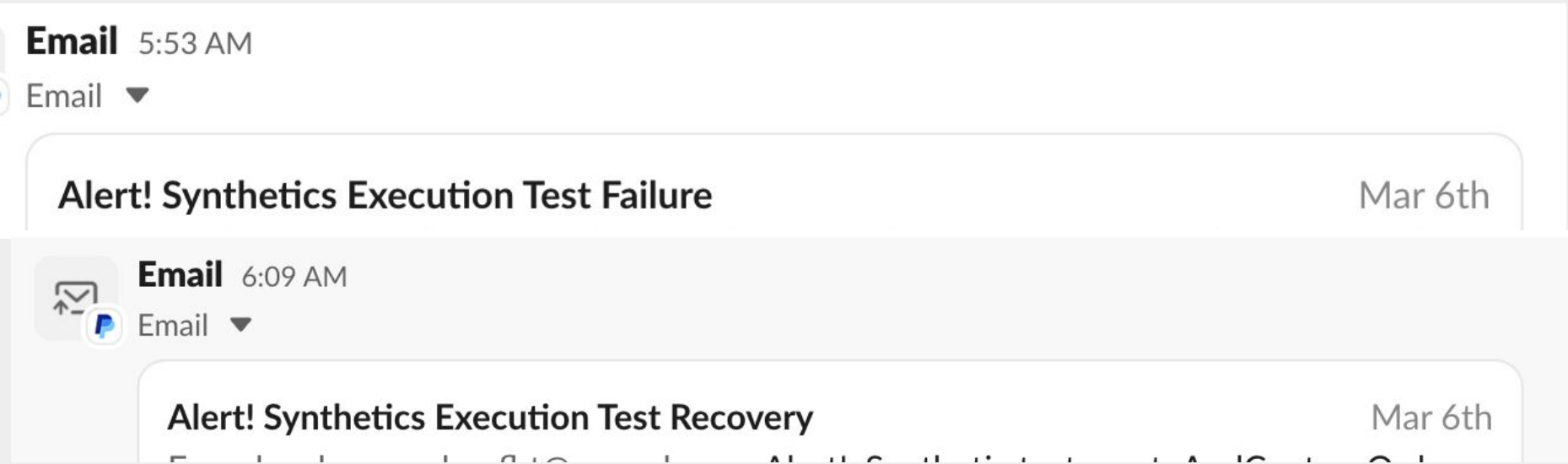
goal — period

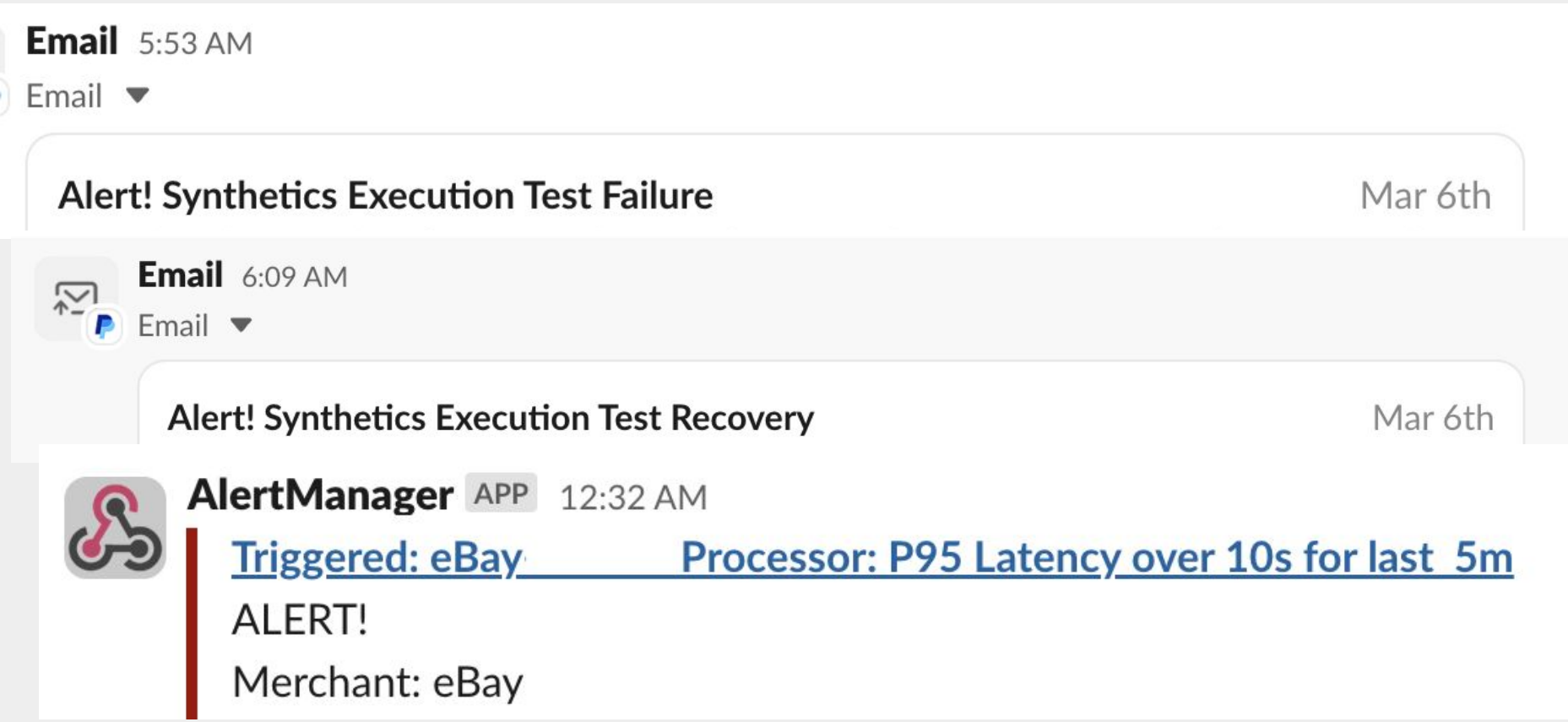
99% of events over 30 days should be processed within 10s

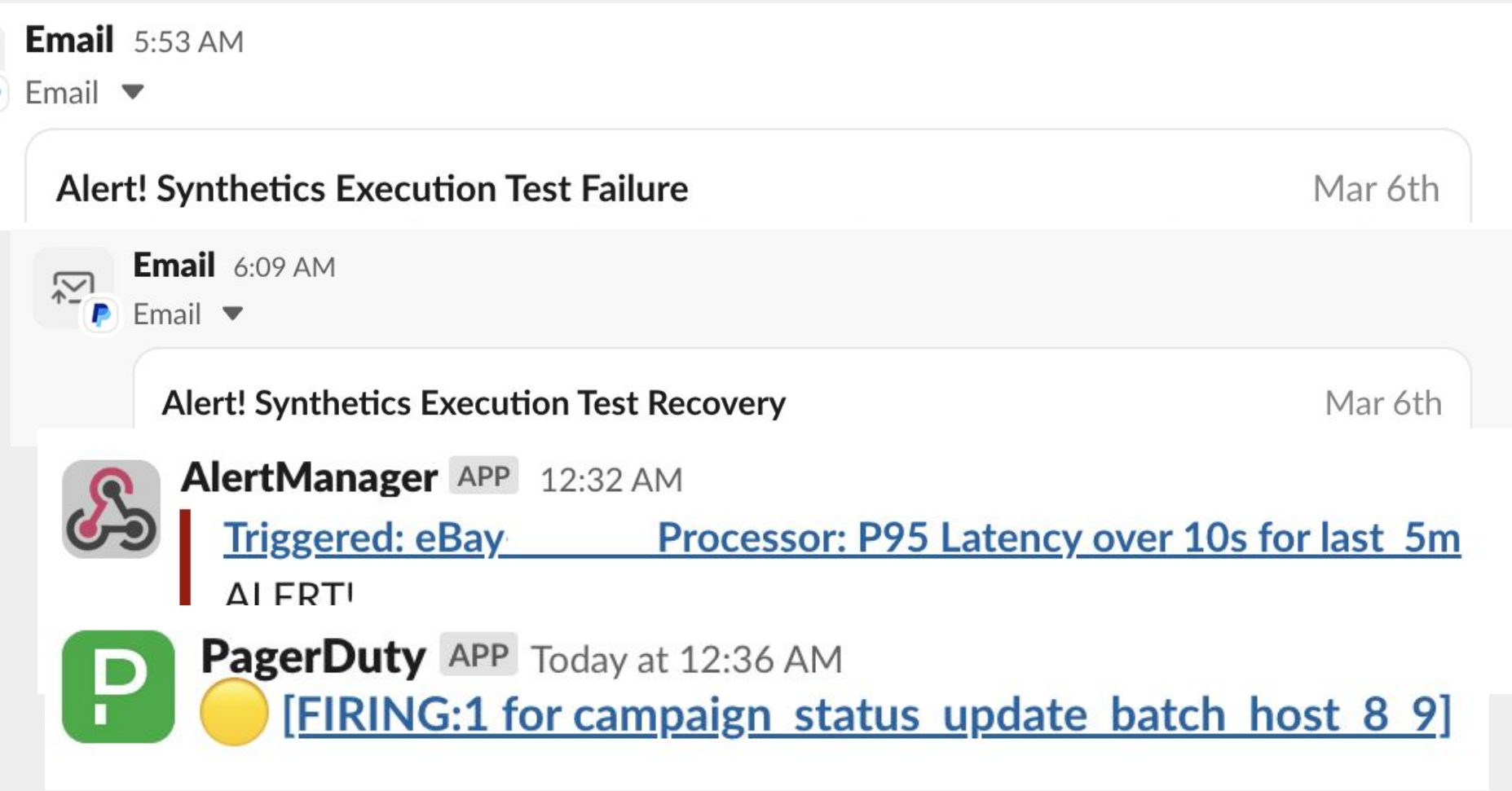
SLI metric

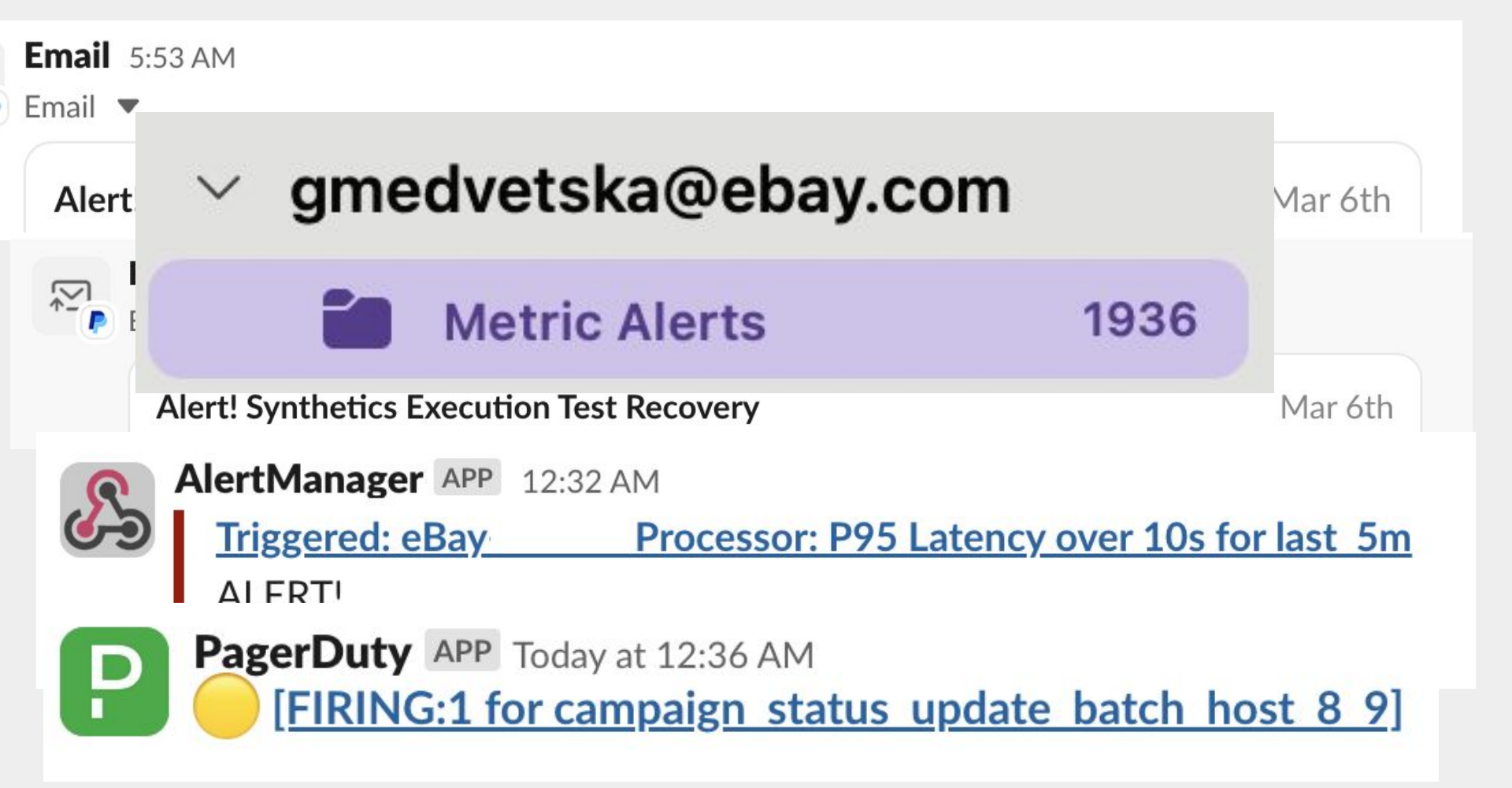
Wicks, R. (2021, December 6). *a mixer mixing a mixture in a glass bowl*. Unsplash. https://unsplash.com/photos/a-mixer-mixing-a-mixture-in-a-glass-bowl-mvl8LEshy6U

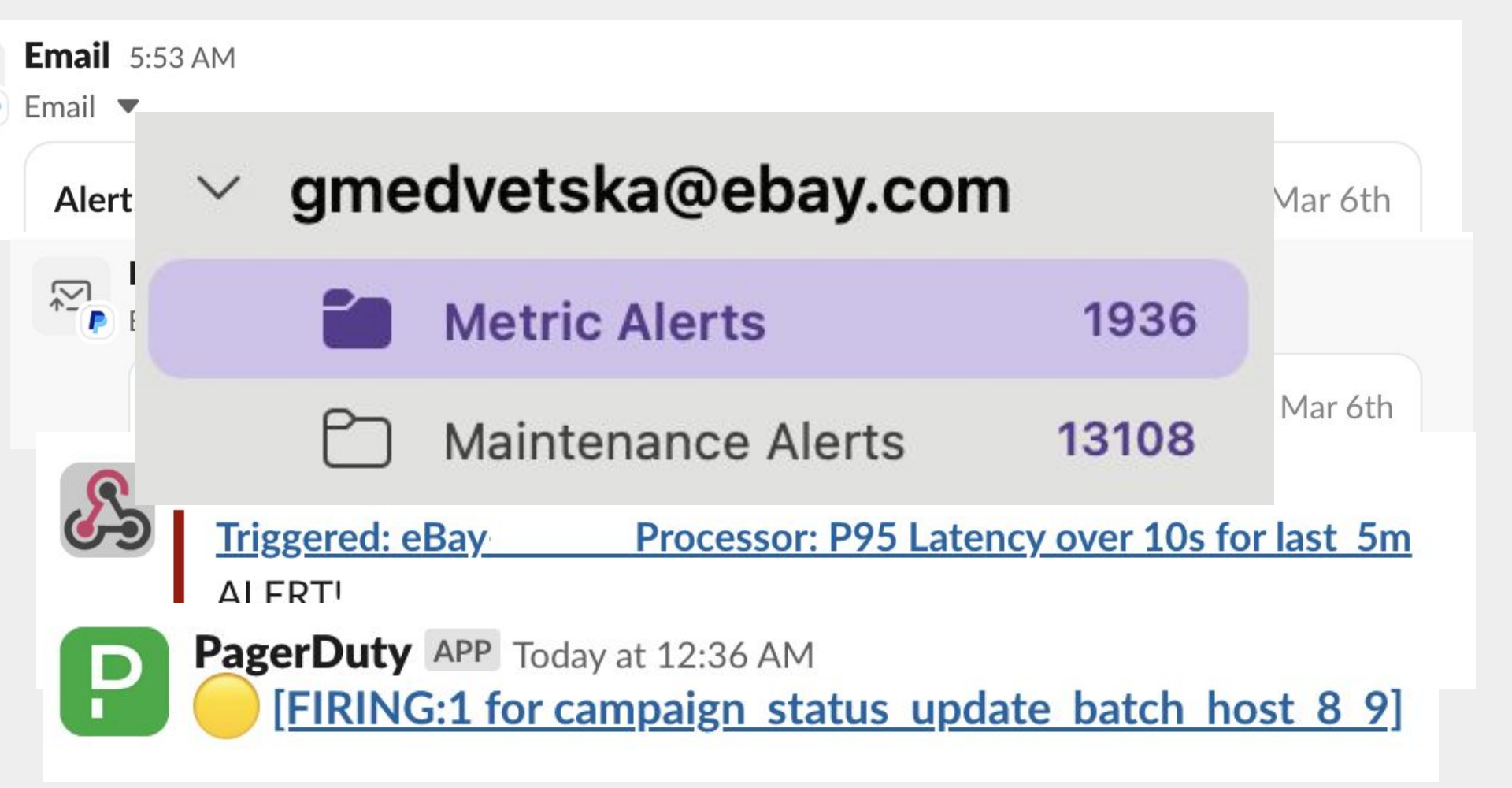


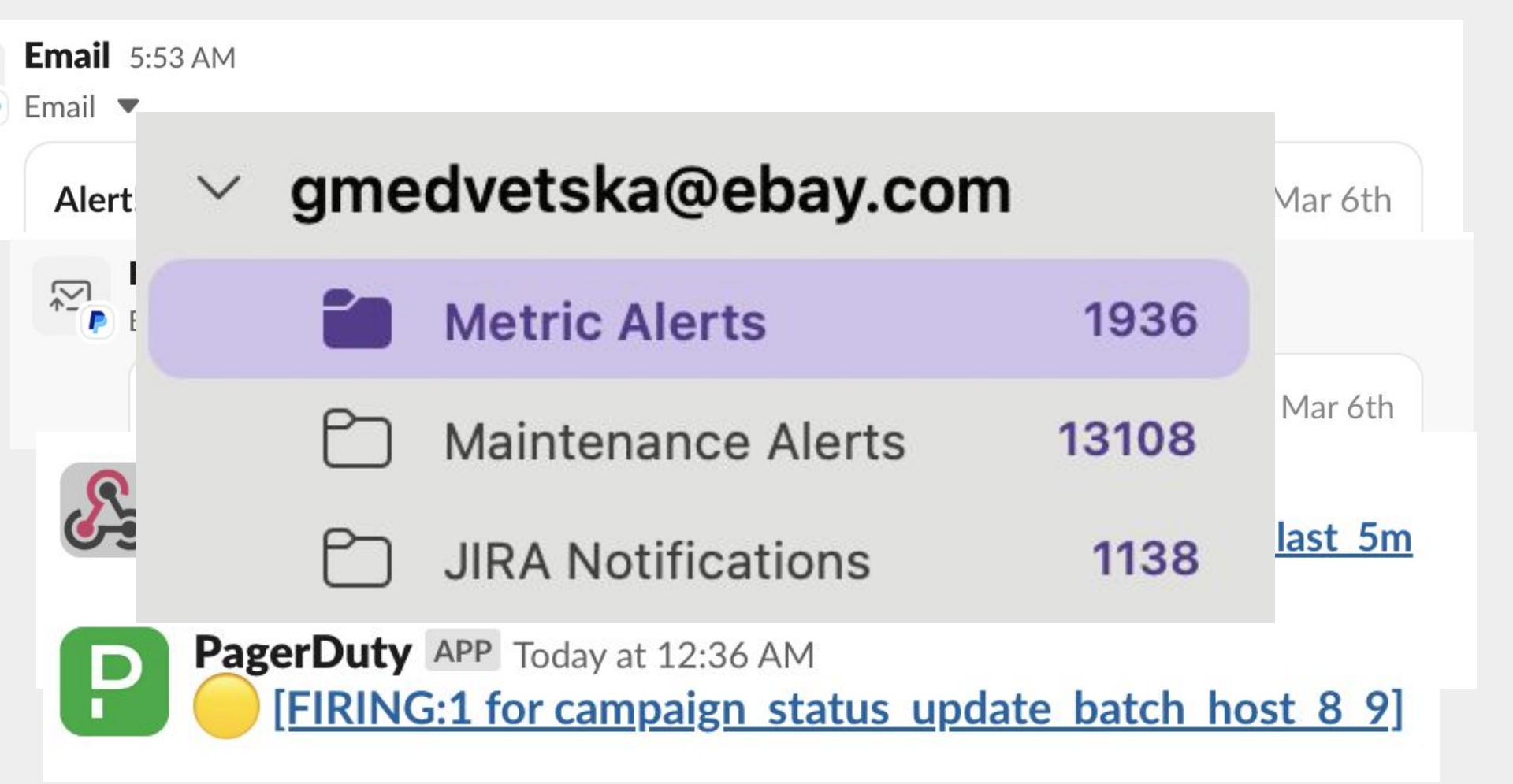


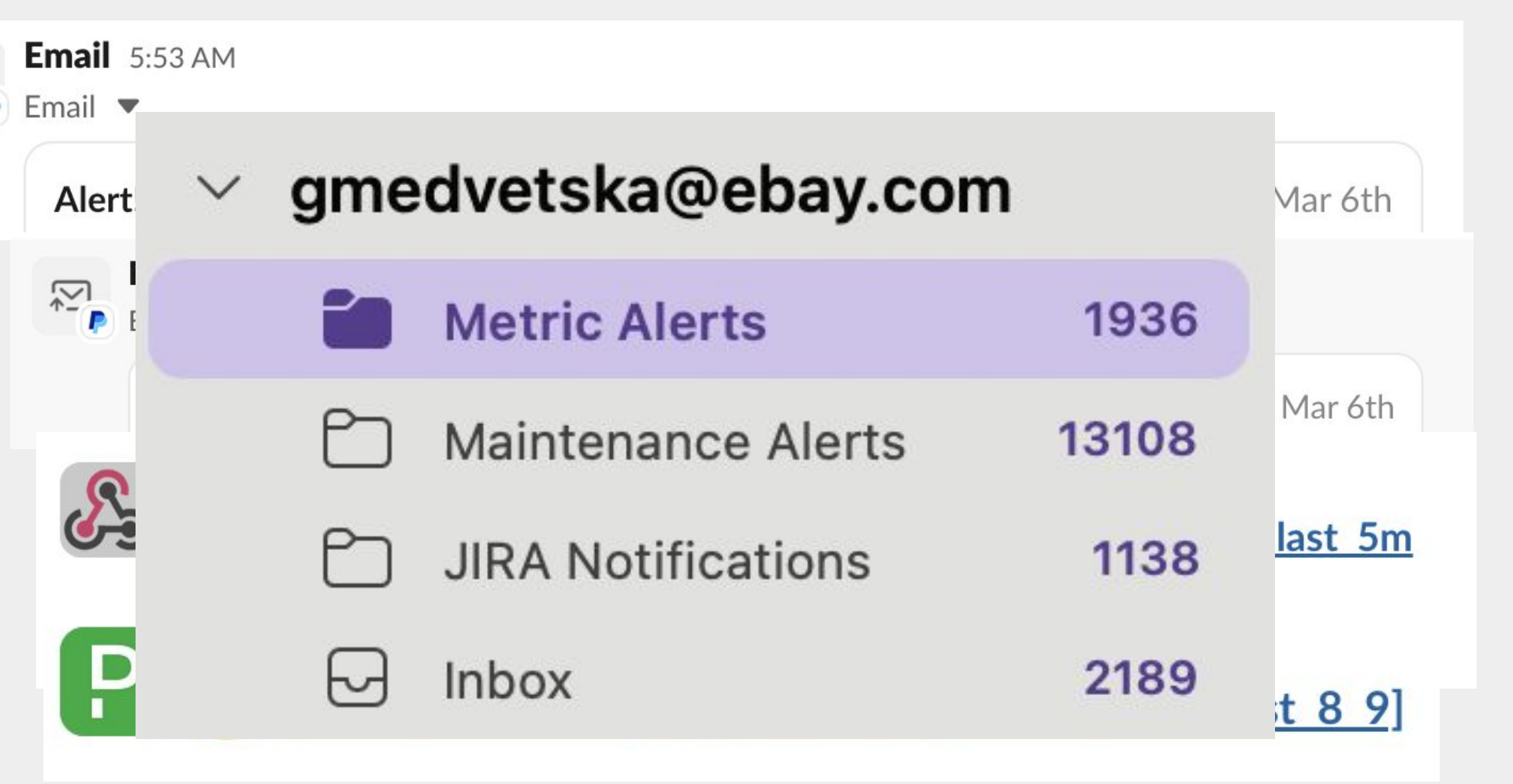




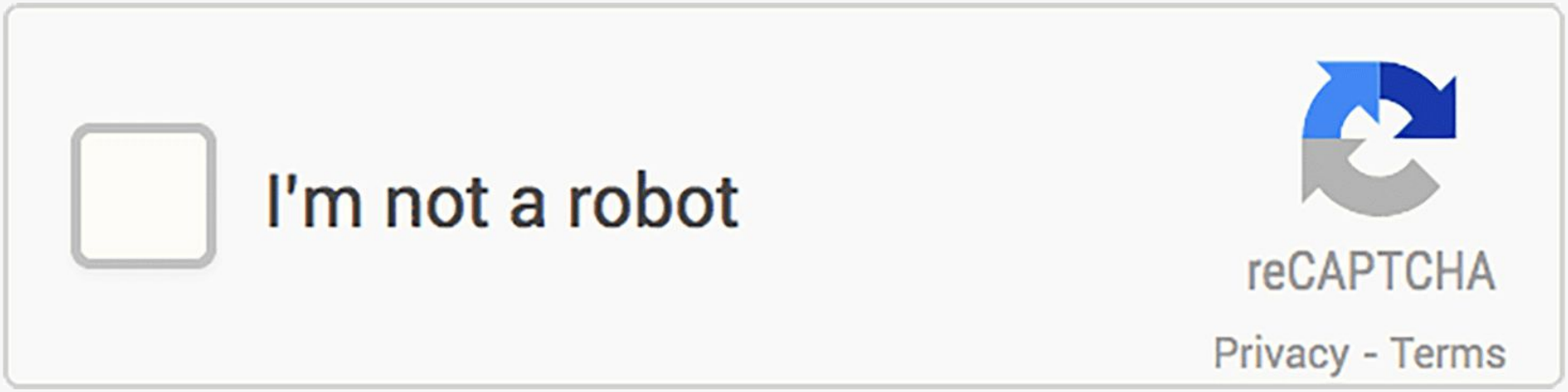








We burn out



Balance Your Flavors

Metrics -> 99 Alerts -> Alert Fatigue

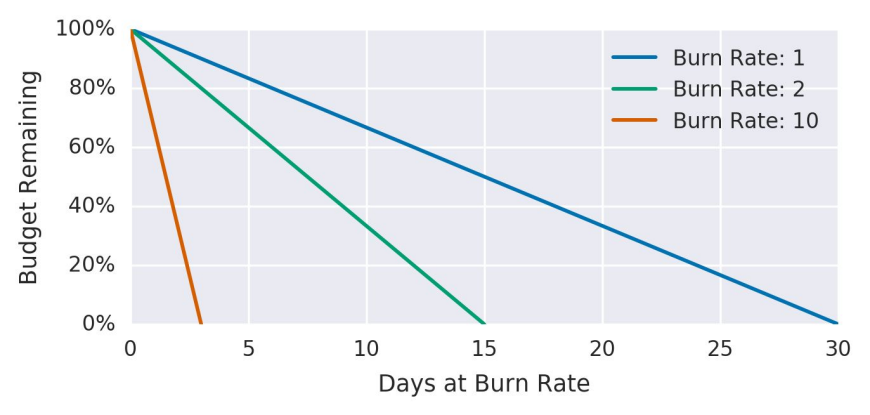
Error Budget & Burn Rate

Error Budget - number of errors accumulated over a certain period of time before your services go out of compliance.

```
Budget of Unreliability (Error Budget) = 100% - availability target %

Budget of Unreliability (Error Budget) = 100% - latency target %
```

Burn rate - how fast relative to your SLO your service consumes error budget.



Jones, Chris; Wilkes, John; Murphy, Niall. Betsy Beyer (ed.). "Site Reliability Engineering: How Google Runs Production Systems". *Google Site Reliability Engineering*. O'Reilly.

Season your alerts to taste

Multi-window multi-burn rate alerts strike the right balance between false positives and sufficient performance monitoring.

```
Burn rate = budget consumed * compliance period / alerting window

Error Budget Consumed = 2%
Compliance Period = 30 days * 24 hours = 720 hours
Alerting Window = 1 hour

Burn rate = 0.02 * 720 hrs / 1 hr = 14.4
```

Alert	Long Window	Short Window	Burn Rate	Error Budget Consumed
Critical (Page)	1 hour	5 minutes	14.4	2%
Critical (Page)	6 hours	30 minutes	6	5%
Warning (Notification)	1 day	2 hours	3	10%
Warning (Notification)	3 days	6 hours	1	10%

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Season your alerts to taste

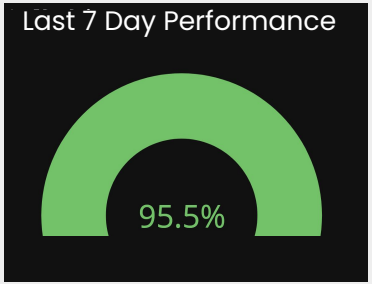
Availability Alert

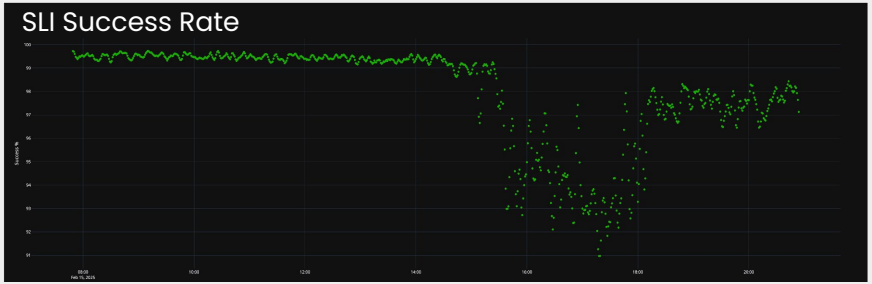
```
((
    sli_error:ratio_rate5m{sli_name="SLI_RankingConsumer_RANK_SEED_ITEM_availability"} > 0.144
  ) and (
    sli_error:ratio_rate1h{sli_name="SLI_RankingConsumer_RANK_SEED_ITEM_availability"} > 0.144
)) or ((
    sli_error:ratio_rate30m{sli_name="SLI_RankingConsumer_RANK_SEED_ITEM_availability"} > 0.06
  ) and (
    sli_error:ratio_rate6h{sli_name="SLI_RankingConsumer_RANK_SEED_ITEM_availability"} > 0.06
))
```

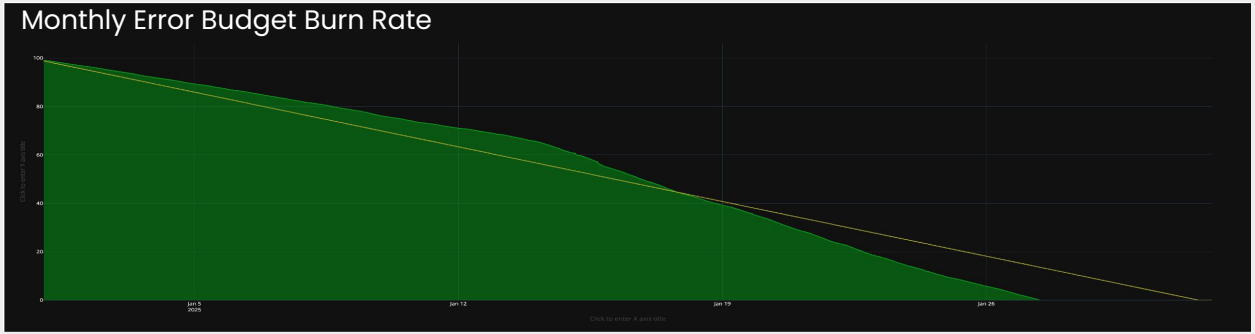
Data Loss Alert

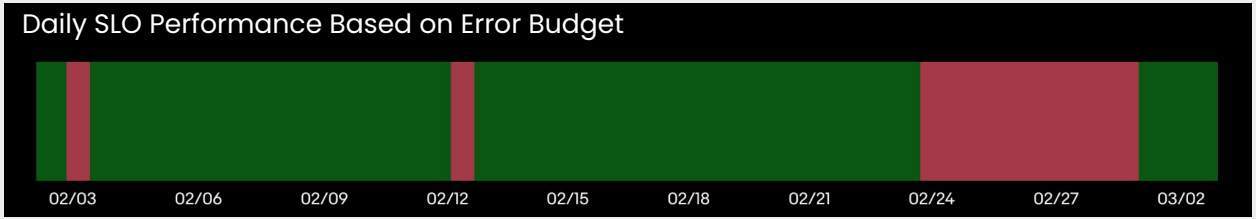
```
absent(
    sum(
        sli_valid_events{sli_name="SLI_RankingConsumer_RANK_SEED_ITEM_availability"}
)) or absent(
    sum(
        sli_good_events{sli_name="SLI_RankingConsumer_RANK_SEED_ITEM_availability"}
))
```

Harnessing Your SLO Metrics









Serving Suggestions

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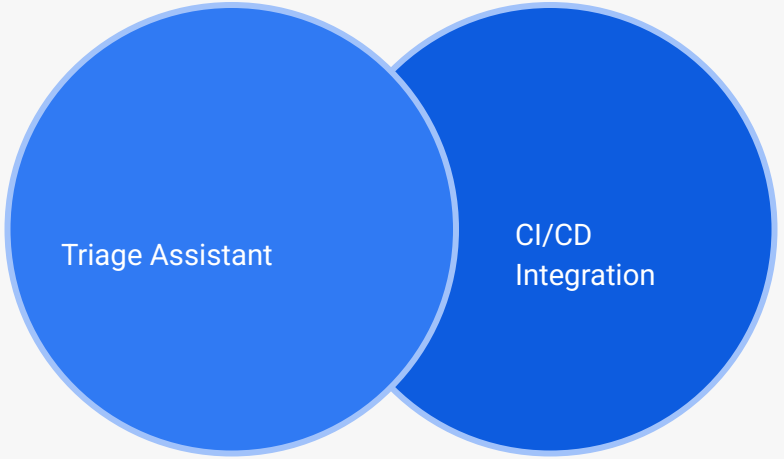

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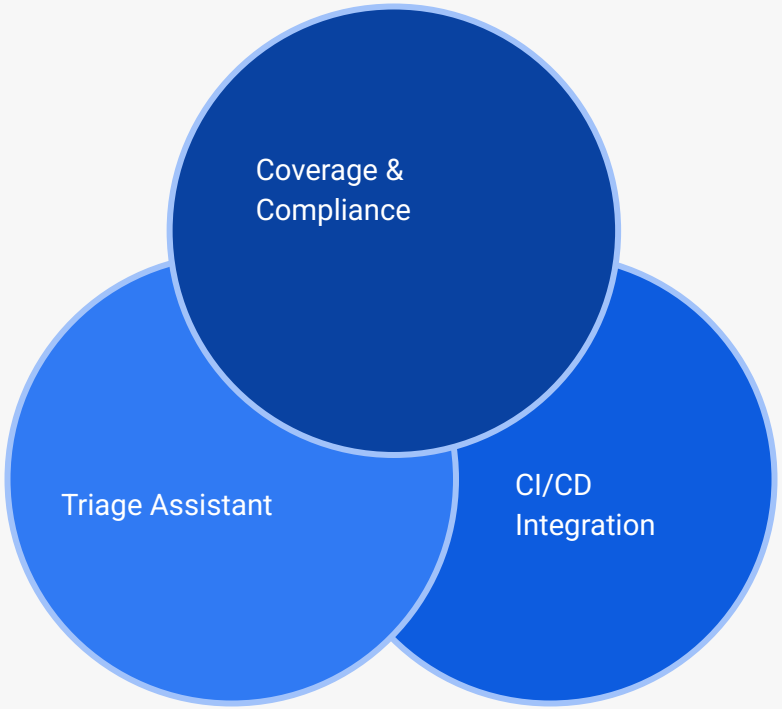


Async SLO case study #1

SLO Burn Rate Alert for pool - r1rmmbescont

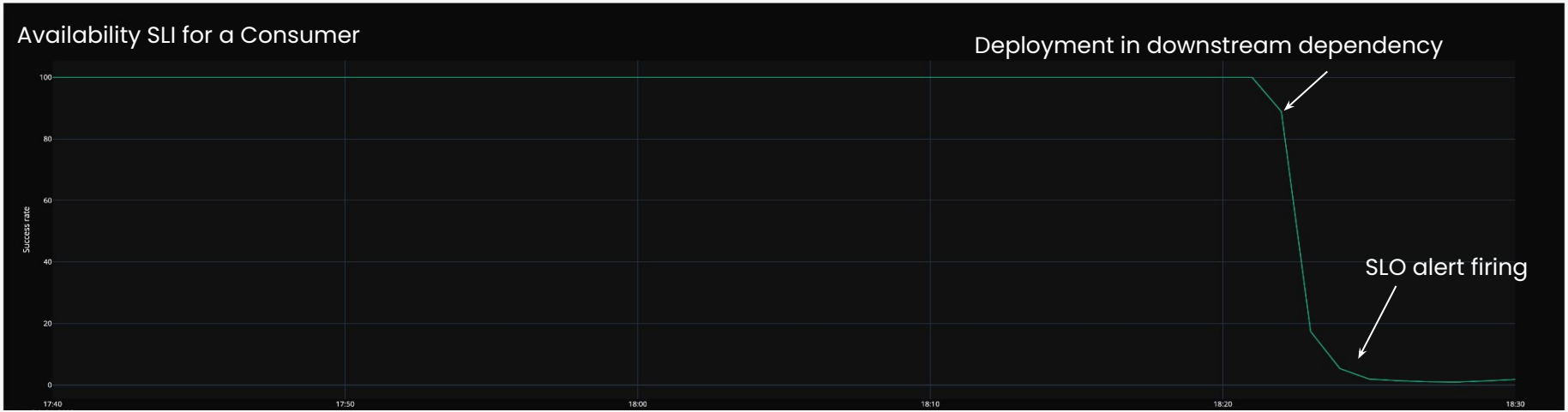
⏰ Alert Details:

- **Started:** 2025-02-19 10:13:04.143 +0000 UTC

🏷️ Labels:

SLI Name

SLI_r1rmmbescont_RmmConsumer_RRP_FLOW_UPDATE_availability

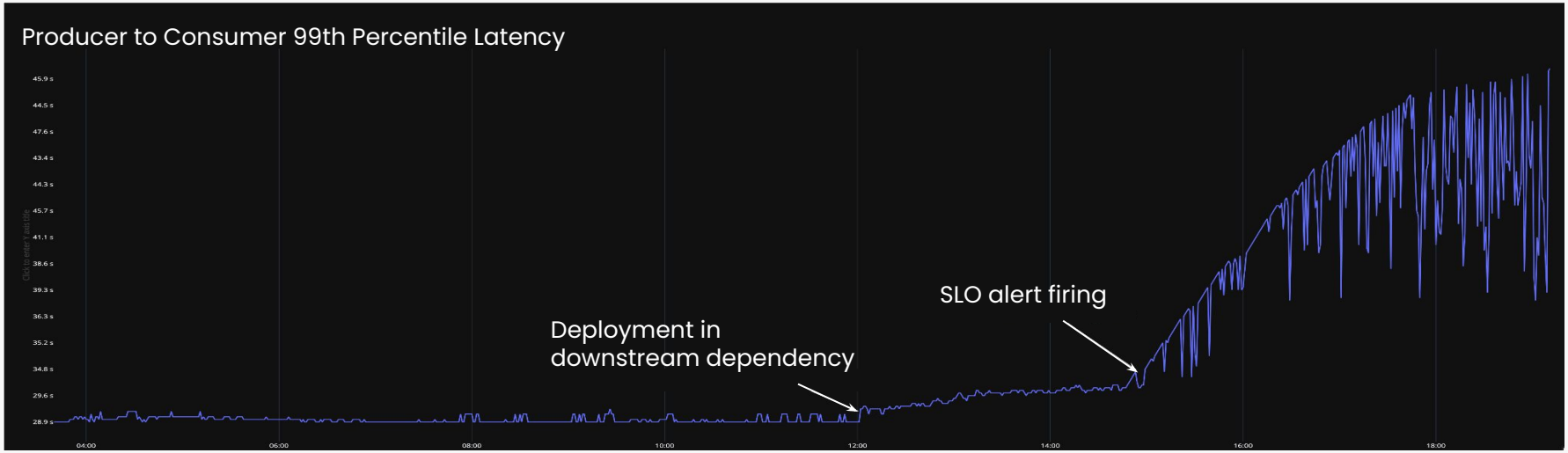


Async SLO case study #2

MyeBay SLO Alert ALERT

Belongs to Incident: [#1283514] MyeBay SLO Alert (Resolved)

Severity	Critical
Alert Times	Open from Jan 15, 2025 at 2:34 PM to Jan 15, 2025 at 8:31 PM (for 6 hours)
Alert Key	b1d25fc5a82c5a9b0ab0953fe881a45e503e281909f323dc702b370d02e48896



It’s a wrap

Stay in touch

Jash Mistry

Member of Technical Staff at eBay

Gabriela Medvetska 🇺🇦

Proud Ukrainian 🇺🇦 | Site Reliability Engineer at eBay 👩‍💻🛍️