



Market Data: Applying SRE Techniques to Legacy Designs

SREcon22 EMEA

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Engineering Division

Agenda

1. Market Data at Goldman Sachs

Bootstrapping a small SRE function in an established and critical team that predominantly uses vendor software

2. Black-box monitoring

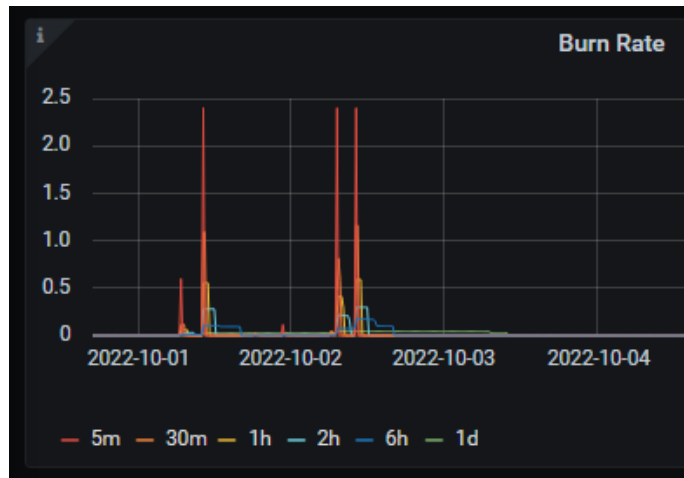
Using probes to rapidly form a benchmark without knowledge of system internals

3. Architecture

Targeted changes to allow future operational flexibility

4. White-box monitoring

Exporters as a method to enable standardisation on OpenMetrics while using incompatible software

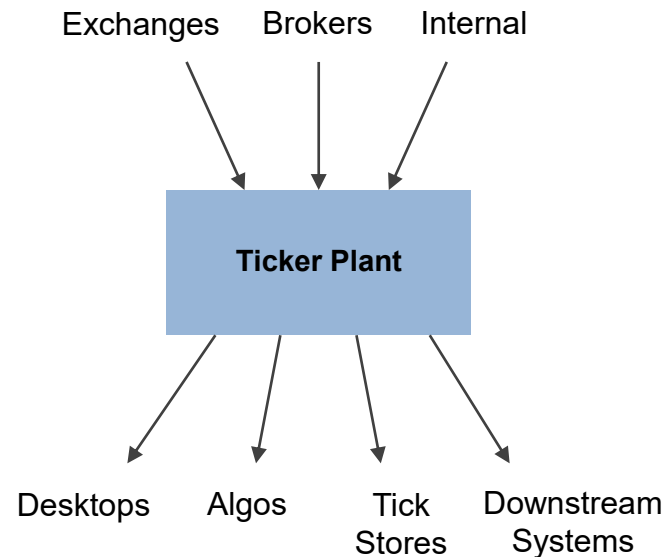


- Provision and distribution of pricing and trade-related data for financial instruments required by Goldman

Sachs businesses

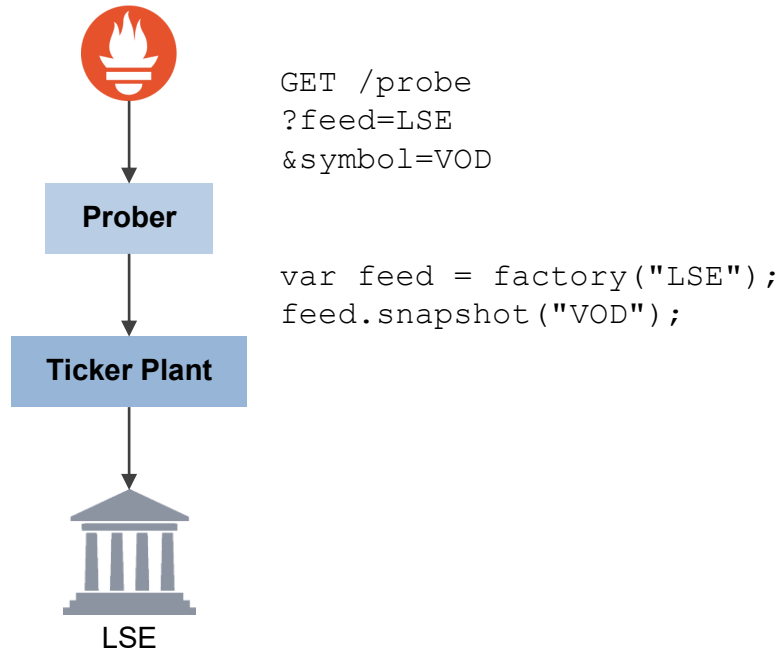
- 10s of engineers
- 100s of feeds
- 1,000s of servers
- 10,000s of internal clients
- 10,000,000s of instruments
- 100,000,000,000s updates per day

- SRE group formed in January 2022

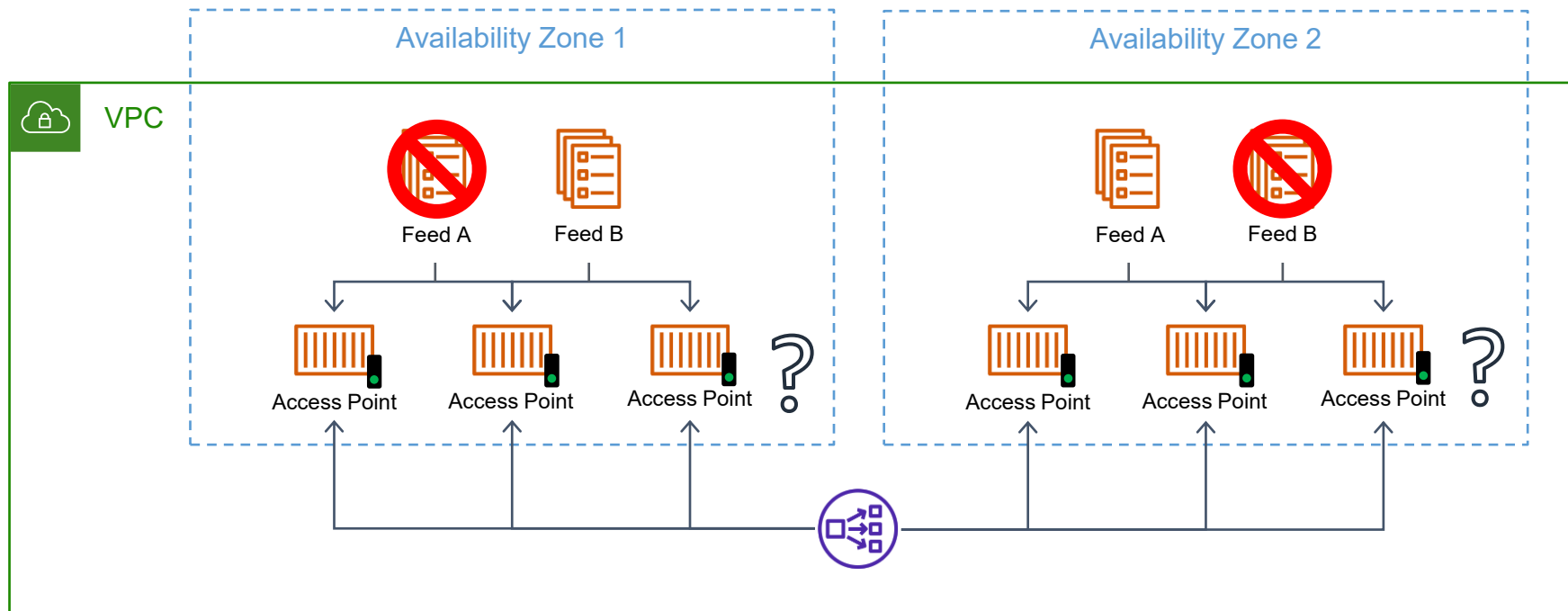


Black-box Monitoring

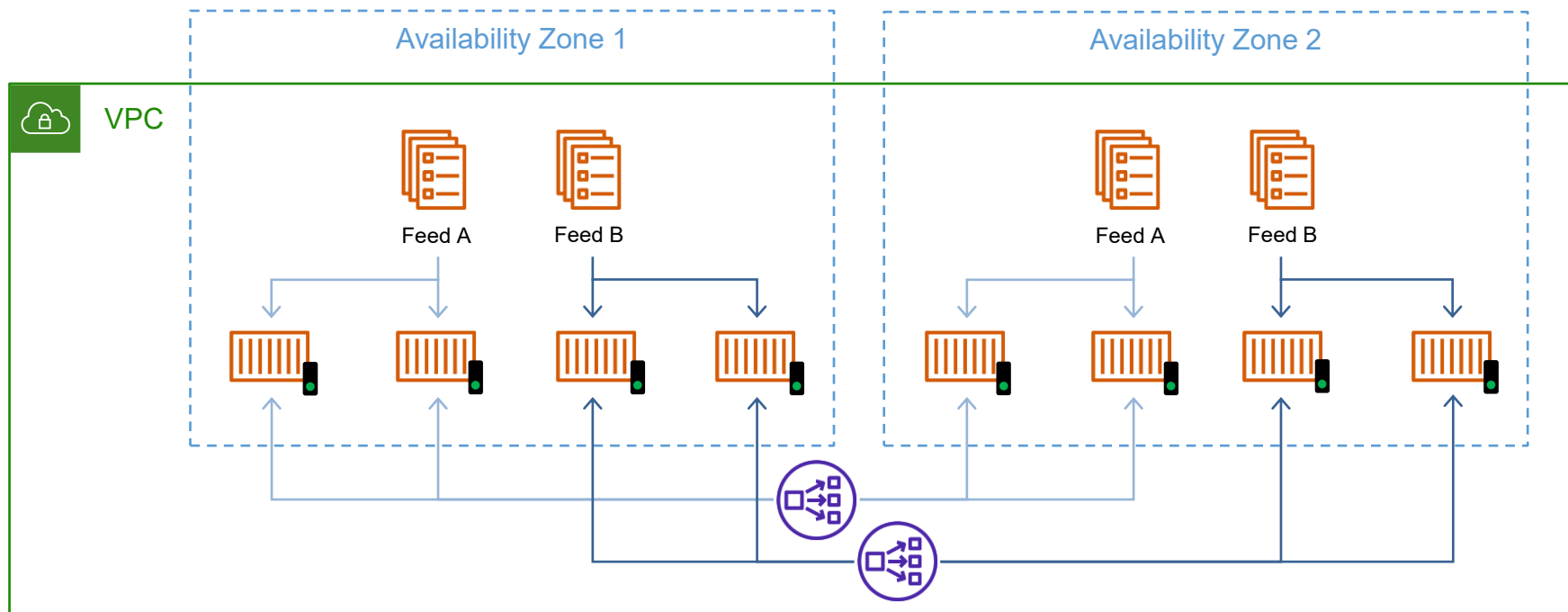
- Rapidly establish availability and latency SLIs
- No knowledge of or modifications required to the service
- Prober uses the same library as real clients
- Revealed undetected systematic issues
- Provided an initial benchmark for on-premise SLOs



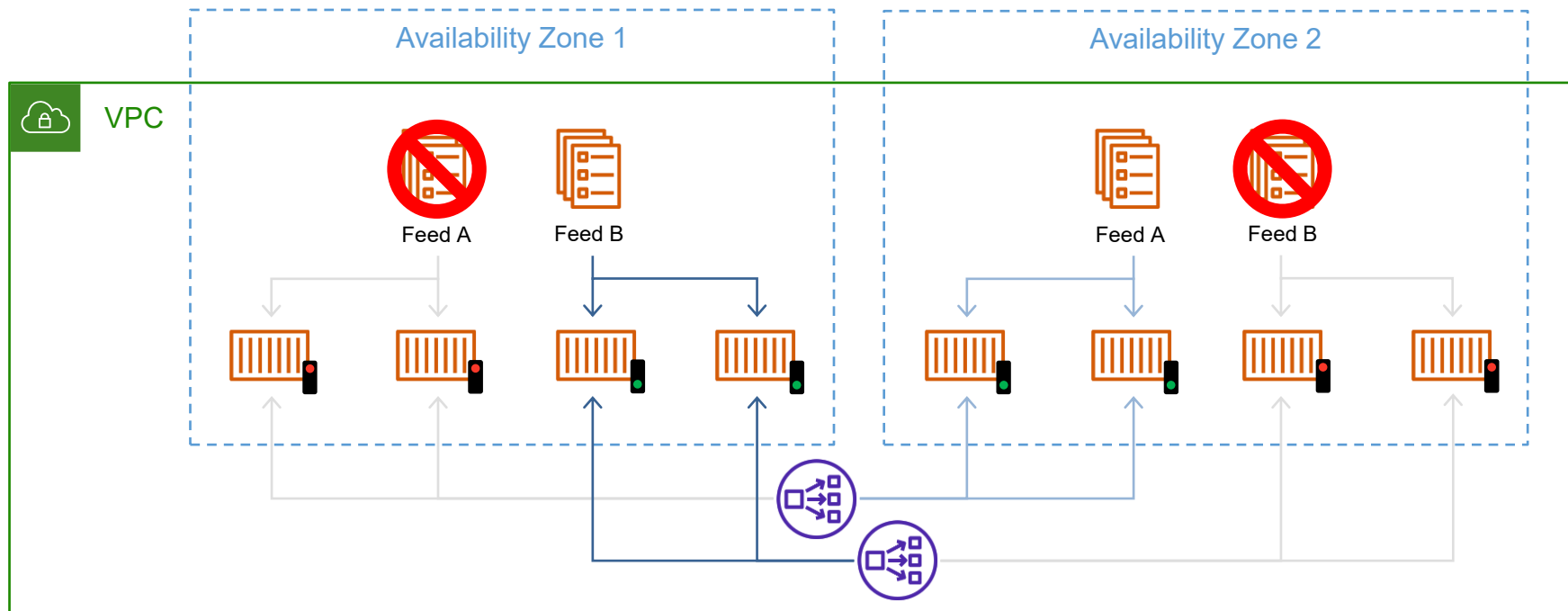
Ticker Plant Architecture



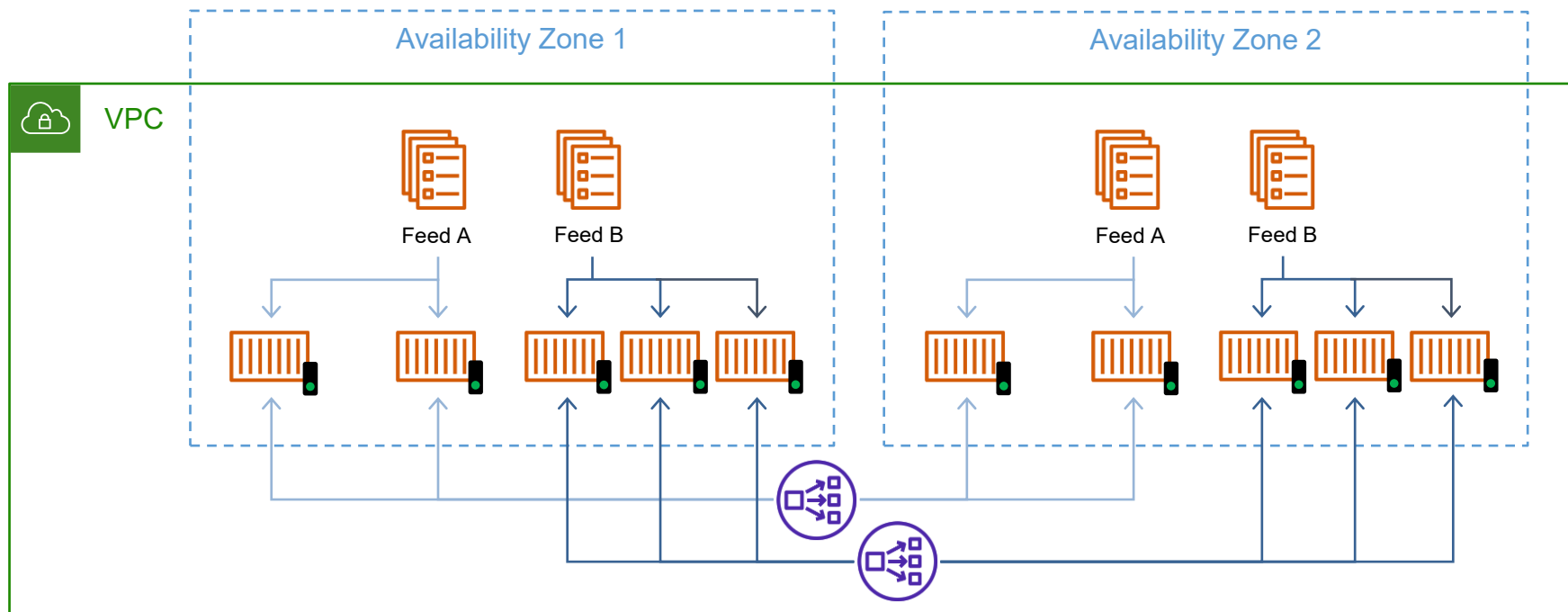
Ticker Plant Architecture



Ticker Plant Architecture

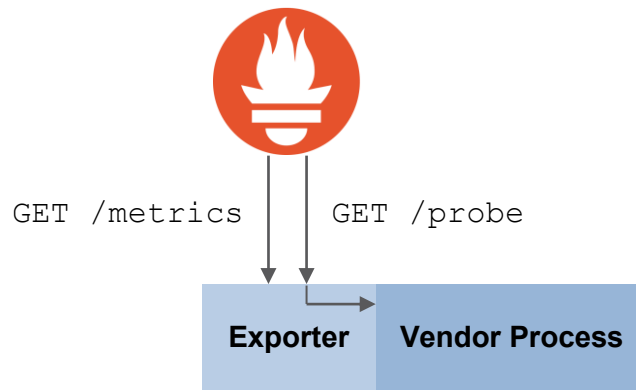


Ticker Plant Architecture



White-box Monitoring

- Exposition from vendor applications
 - **Simple**: JSON over HTTP
 - **Challenging**: debug tool, parsing stdout
- Rendering metrics
 - Separate endpoints for exporter-internal and main process
 - Strive to fully understand the meaning of each metric
 - Normalise labels, tidy up timestamps
 - Consider per-client metrics, being wary of cardinality
- Quality over quantity



```
{  
  "daysBeforeExpired": 36  
}
```



```
license_expiry_time_seconds 1.665417849e+09
```

Conclusion

1. Vendor software is challenging to work with, however especially worthwhile
2. Probers provide an early benchmark, without knowledge of internals
3. Small, targeted changes can drastically improve future maintainability
4. Invest in exporters to retrofit OpenMetrics
5. Talk to your vendors about observability