

Logging & Monitoring

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Overview

1. Presentation

- a. Logging
- b. Monitoring
- c. Observability

2. Demos

- a. Logging in Python
- b. Prometheus
- c. Grafana



Why logging?

We log events in applications to help with:

- Debugging
 - Identify errors and unexpected behavior
 - Confirm correct behavior
 - Measure performance
- Auditing
 - Business & legal audits
 - Data Analytics



Why monitoring?

We monitor deployed software applications so that we can:

- Sleep at night
 - Having insight into system performance increases confidence in reliability
 - Monitoring usually includes alerting as well
- Improve system performance
 - Identifying performance bottlenecks allows for optimization
- Improve user satisfaction / system value
 - Users don't like errors and software bugs

Logging





What is Logging?

- Logging is the process of creating Logs from a series of events
- Within software development, Logs are text files created as an application runs
- Ideally logs are **Write Once, Read Never**



Logging frequency vs data storage:

Log Rotation

Data volumes get out of control with high resolution high speed logging:

~100 ascii characters per log entry = 100 bytes per line.

~10 logged entries per second * 100 bytes per entry = 1 kbps = 3.6 mbph = 86 Mb / Day

1 kbs of new logs would fill up **10GB in 115 days ... a 10GB server would fall over in 4 months just due to log files**

This can be solved by 'rotating' logs: create a new log file frequently and dispose of the old files



Log rotation techniques

Techniques to rotate logs:

1. Create a new log file every time period or amount of data
 - a. New log file every hour/day
 - b. New log file every GB
2. Delete old log files after a time period
 - a. 30/90 day retention policies
3. Compress / reduce log files
 - a. Reduce storage by compressing files and deleting unneeded details
4. Archive / extract log files to another server
 - a. They don't take up space on your machine anymore.

Monitoring





What is monitoring?

- Monitoring is the process of observing system performance
- Types of Metrics that can be *monitored* include:
 - Counts - # of requests served
 - Rates - % of cpu utilization
 - Statistics - Avg request latency



Logs --> Metrics

Many interesting metrics are derived from logs:

```
2021-02-21 14:48:45,062 Request returned HTTP 200
2021-02-21 14:48:45,352 Request returned HTTP 200
2021-02-21 14:48:45,575 Request returned HTTP 200
2021-02-21 14:48:46,913 Request returned HTTP 200
```

=

4 successful requests

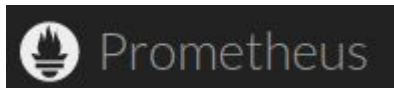


Monitoring Ecosystem

Monitoring platforms
make life easier.

And are big money:

Datadog IPOd in 2019 and
now is worth \$30B



Questions & Demo

<https://github.com/DataDrivenAngel/logging>

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