CS 2270: Managing and Mining Massive Time series

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Agenda

- What this class is about
- Projects
- Readings

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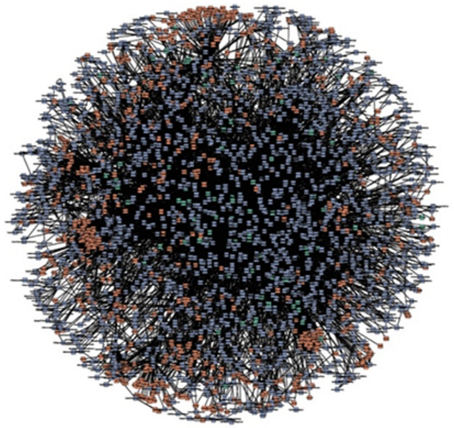
What this class is about

- Storing and Querying Time Series
- Time Series Analytics (e.g. Similarity Search)
- Observability

Storing and Querying Time Series

- Time Series Data Model and Workload
- Ingesting High-Cardinality Time Series Data
- Compressing Massive Time Series Data
- Planet-Scale Time Series Data



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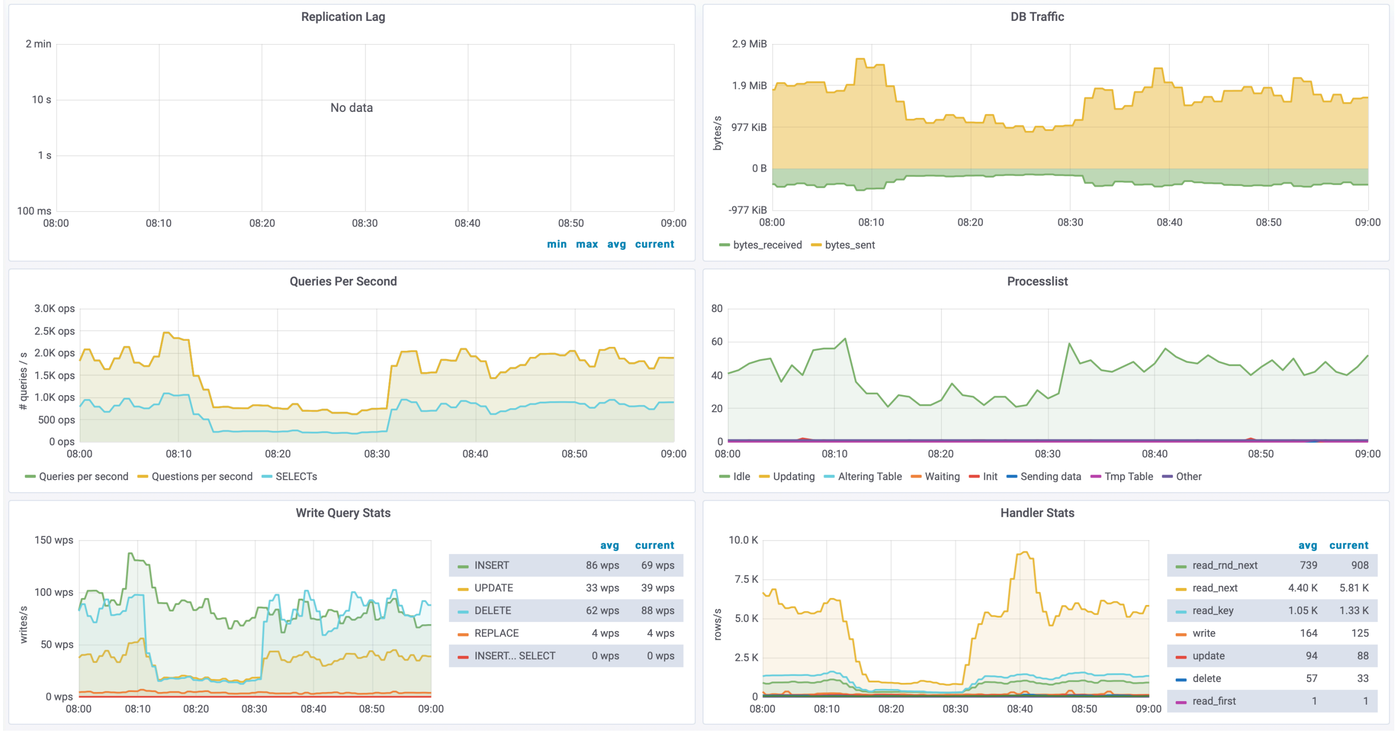
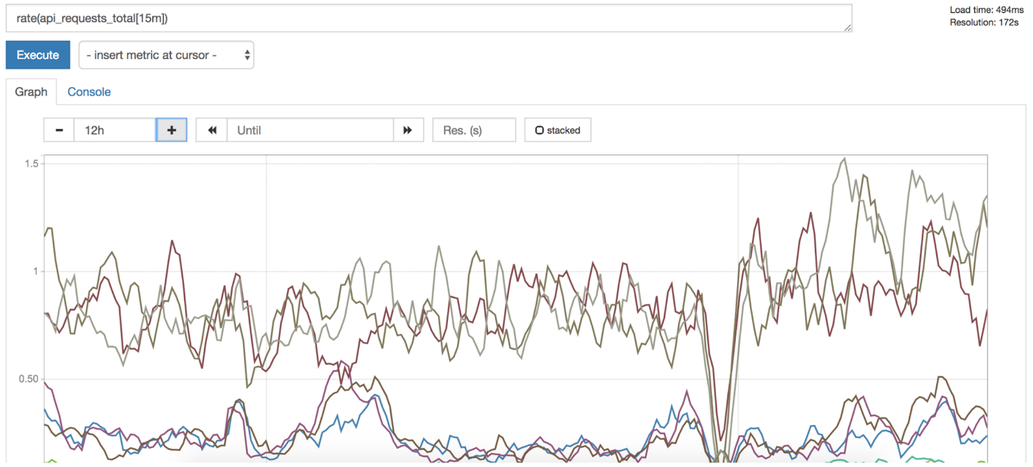
Complex Time Series Queries: Similarity Search

- Two Perspectives: Similarity Search and Databases
- Anomaly Detection
- Representation Learning



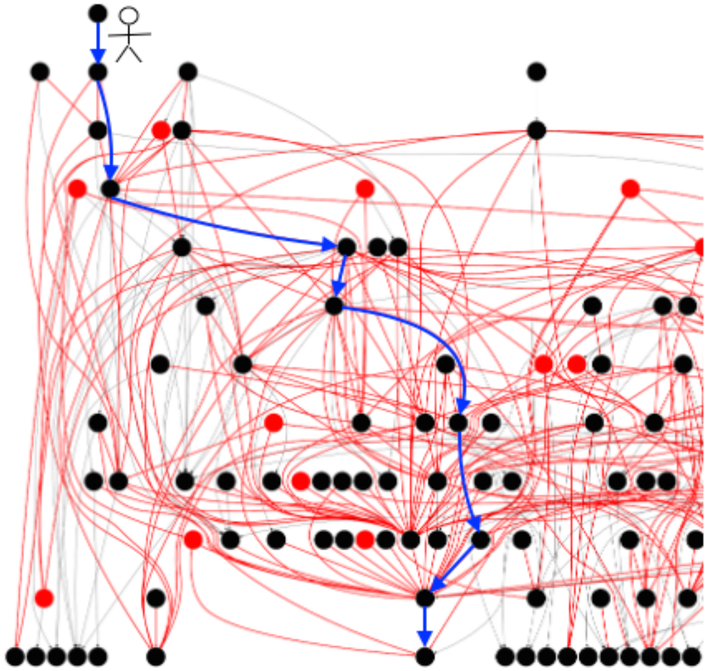
Observability: Metrics

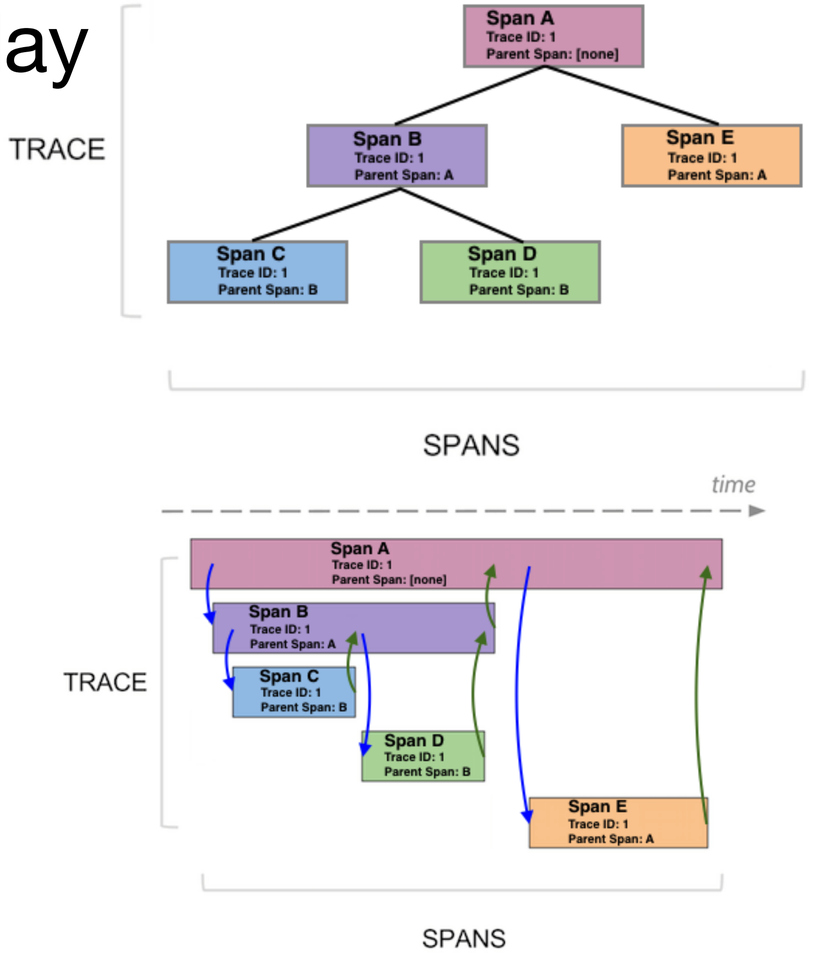
- Use metrics to learn about a complex system (12TB/day)



Observability: Traces are Time Series?

- Execution paths of an operation 2TB/day





Weekly Logistics

- 2 papers per week
- 2 presenters per week
- Paper-review form for non-presenters
- Raise hands and Participation

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Projects

- Systems: Storage and querying for high cardinality data
- Analytics: autoencoder to learn time series representation
- Decide by February 8

Systems: Time Series Storage and Querying

- Provide you with a simple code base in Rust
- Support inserts and selections
- Time series benchmark suite
- **Goal**: High performance and high compression

Analytics: Time Series autoencoder for clustering

- Provide you with evaluation code (Python and probably TensorFlow)
- UCR/UEA Time Series collection
- **Goal**: good training and clustering performance across ALL datasets

Final Presentation and Report

- Project Presentation summarizes your report
- Project report will follow SIGMOD paper format style

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Readings

- 2 readings per week
- 2 presenters each week (likely also project partners)
- Weekly reading review form (except the presenters)