BUILDING BETTER HUNT DATA

SANS THREAT HUNTING SUMMIT 2021, JOSH LIBURDI

Agenda

or ... Data: The Good, the Bad, and the Ugly

- » How should we evaluate data quality?
- » Why do we want high quality data?
- » What are signs of low quality data?
- » How can we improve data quality?

BACKGROUND

- Experience: 8+ years in detection & response, including hunting and systems engineering
- Work: Security Engineer @ Brex
- GitHub/Medium/Twitter: @jshlbrd

GOALS FOR THIS TALK

- Threat Hunters
  - "Do we have good data? Could it be better?"
- Security / Data Engineers
  - "Do our systems provide the best data possible?"
- Security Leaders
  - "I should ask about the quality of our data!"

EVALUATING DATA QUALITY

OR ... WHAT IS GOOD DATA?[1]

- Accuracy
- Completeness
- Consistency
- Timeliness
- Uniqueness
- Validity

[1] https://threathunterplaybook.com/pre-hunt/data_quality.html

BENEFITS OF HIGH QUALITY DATA

INCREASED EFFICIENCY & IMPACT!

- Reduces time and complexity of going from hypothesis to analysis
- Improves trust in analysis
- Increases impact hunt has on other groups, especially detection engineering
  - Collaboratively share content
  - Cooperatively improve data

SIGNS OF LOW QUALITY DATA

Warning Signs

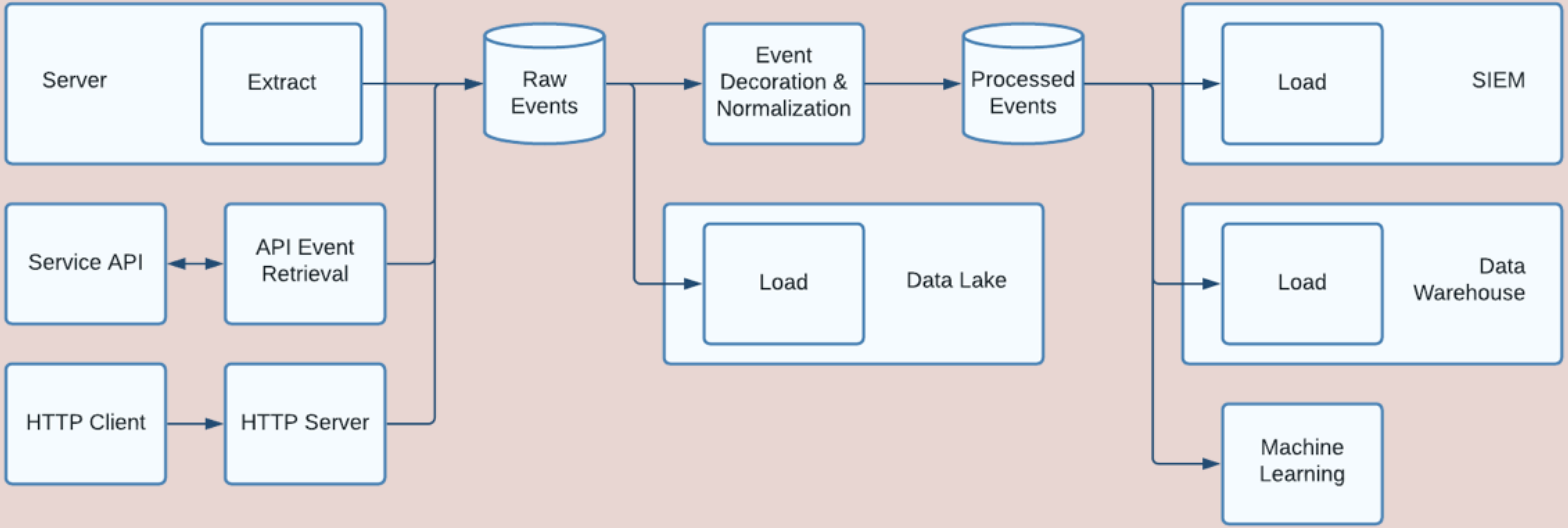
- You look for data that doesn't exist
- You can't find data that you know is there
- You wait, and wait, and wait for data to arrive
- You triple check your results
- You spend more time in data prep than analysis

AD HOC DATA PREPARATION

- Annoyed with converting between data formats?
  - CSVs haunt your dreams? Terrified of XML?
- Tired of copy+pasting code to slice field values?
  - Wasting time tinkering with regular expressions?
- Sick of adding context?
  - "Who is 8.8.8.8 anyway?"

HOW CAN WE IMPROVE DATA QUALITY?

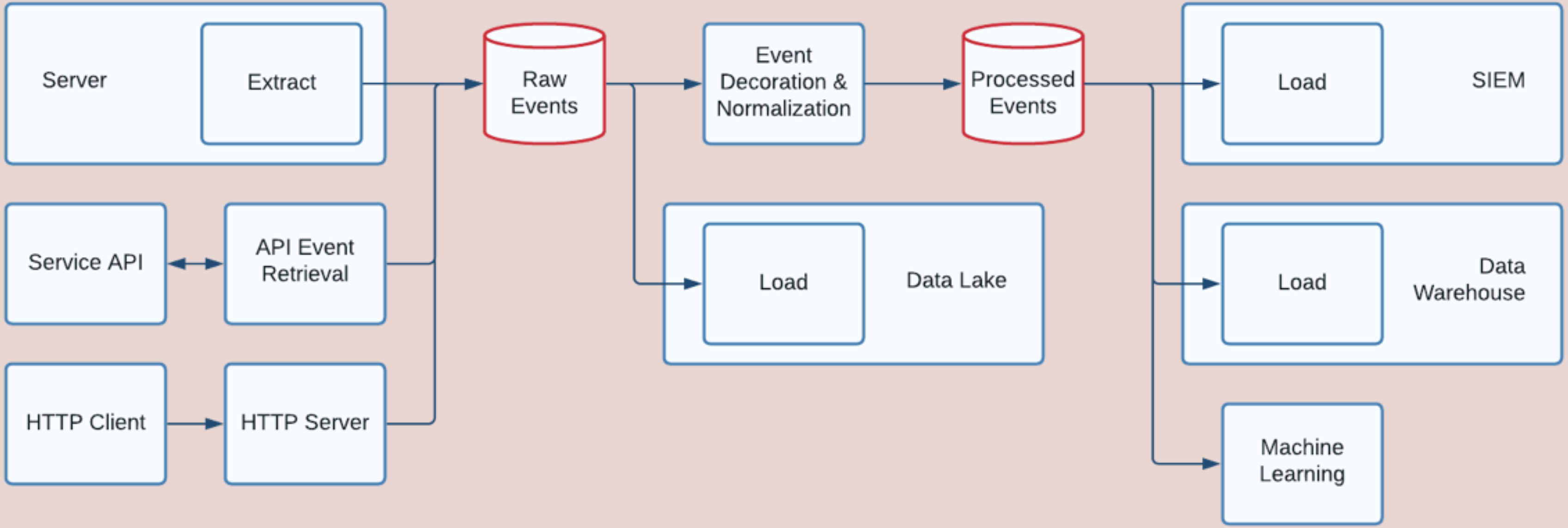
DATA PIPELINES!



FOCUS ON ...

- Availability of data
- Consistency of data
- Timeliness of data
- Completeness of data

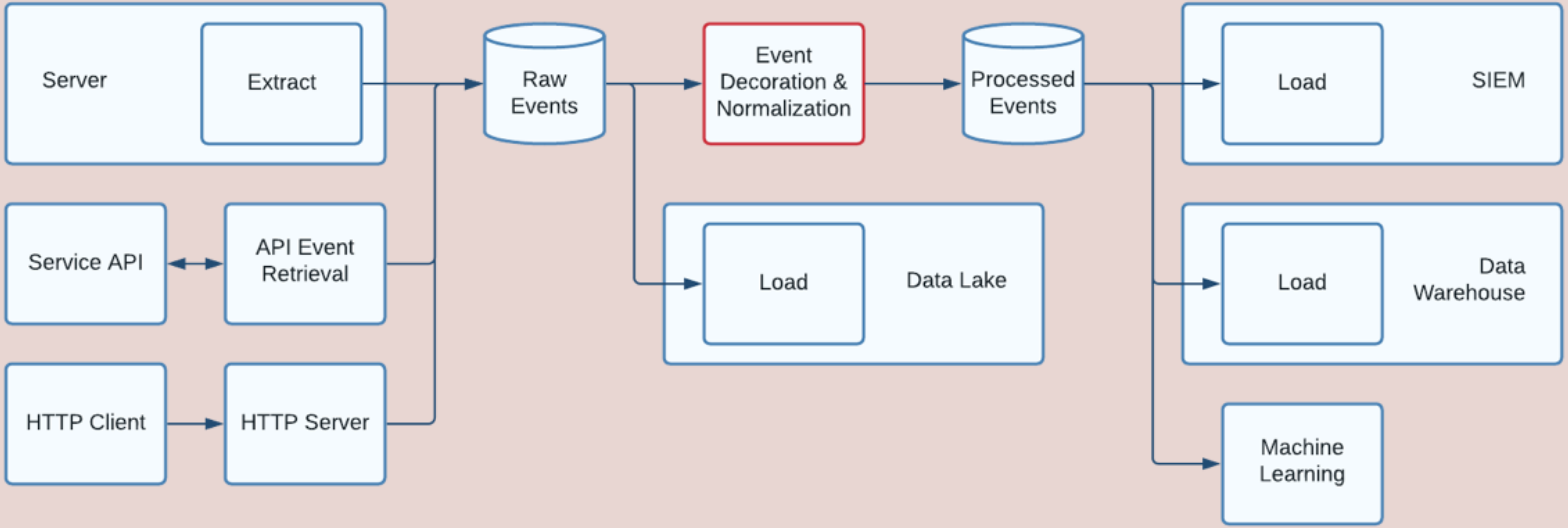
DATA AVAILABILITY



DATA AVAILABILITY

- 2 event streams per dataset
  - Raw: unmodified
  - Processed: formatted, normalized, decorated
- Supports concurrent downstream applications
  - Filter, selectively load events into each app
  - 50% into SIEM, 100% into warehouse, 5% into ML

DATA CONSISTENCY

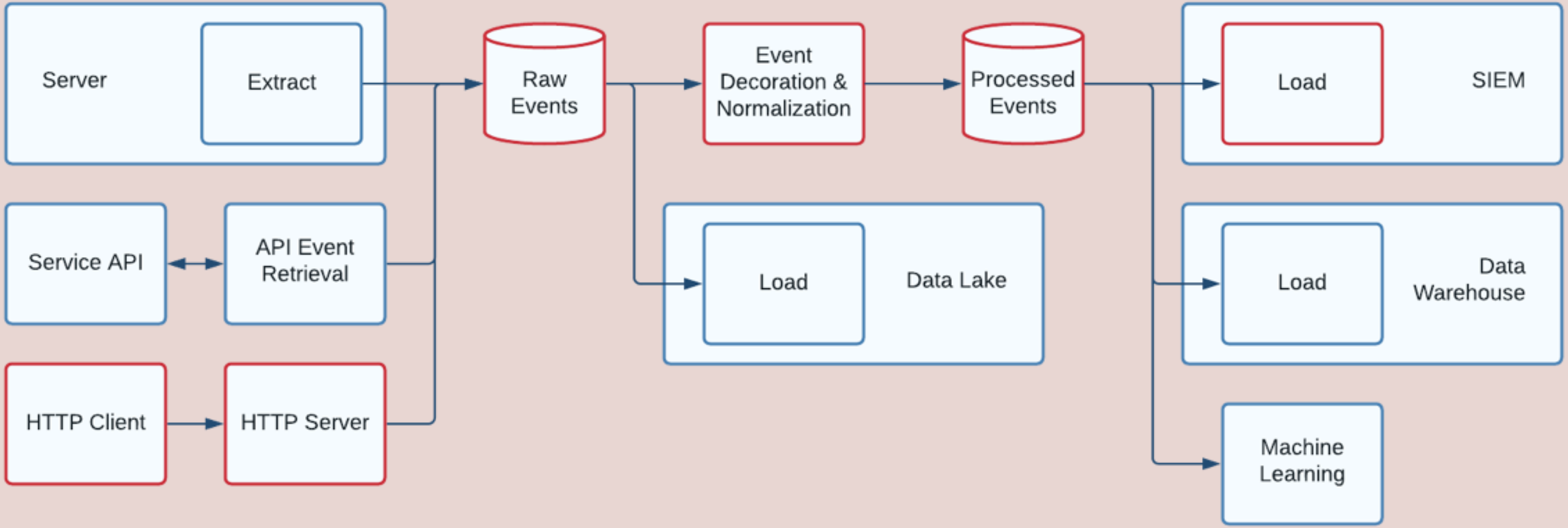


DATA CONSISTENCY

- Formatting
  - Convert data between formats (e.g, CSV to JSON)
- Normalizing (Common Information Models[2])
  - Prefer unified, permissive schemas
- Decorating
  - Enrich data with external & internal context

[2] https://threathunterplaybook.com/pre-hunt/data_standardization.html

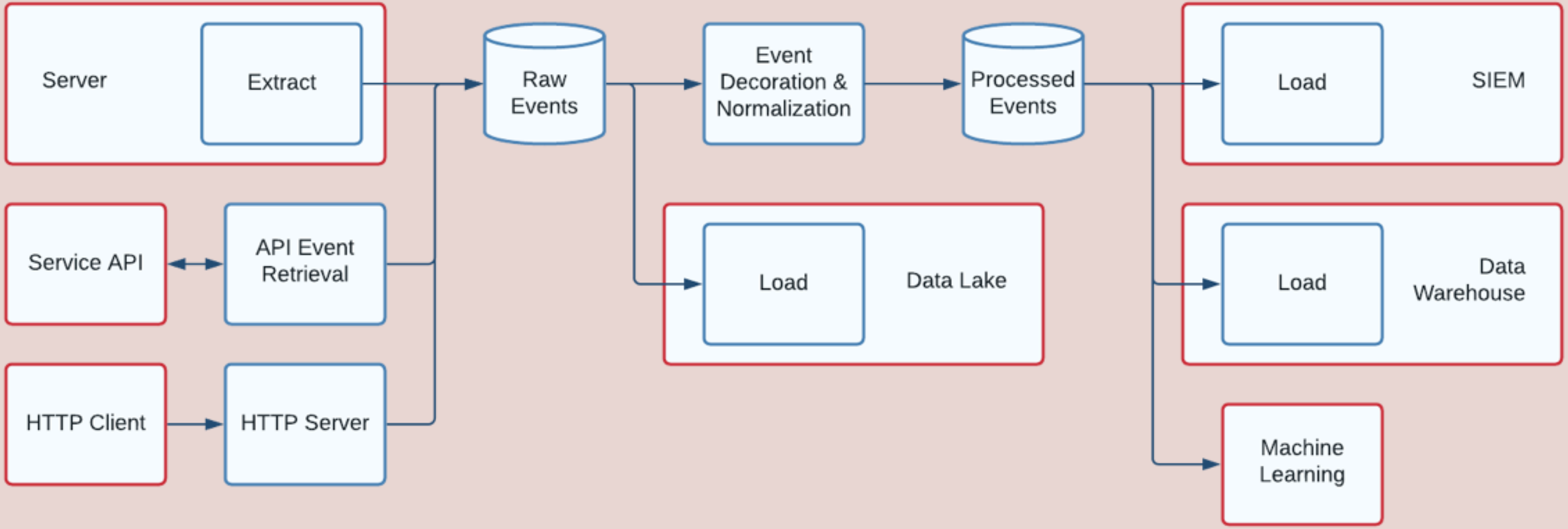
DATA TIMELINESS



DATA TIMELINESS

- Retention
  - How long should you keep your data?
- Speed
  - How soon does your data need to arrive?
- Focus on what, how, who for determining timeliness
  - Type of data (endpoint, network, service audit)
  - Type of analysis (real-time, batch, ad hoc)
  - End users, staffing model (24x7 vs 12x5)

DATA COMPLETENESS



Data Completeness

- Coverage
  - What % of systems delivered data?
  - Compare data against trusted sources
- Reliability
  - What % of data was delivered? lost? malformed?
  - Test with labeled, scheduled data (e.g. tracers, simulated attack data)

SUMMARY

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- Actively think about improving data quality
  - Remember the signs of low quality data
- Monitor & continuously improve data
  - Measure & test for timeliness & completeness
  - Use a unified, permissive CIM schema
- Own your data with a self-managed data pipeline
  - Focus on availability and consistency of data

APPENDIX

Resources for Data Pipelines

- What Is a Data Pipeline?
  - https://hazelcast.com/glossary/data-pipeline/
- Data Engineering and Its Main Concepts
  - https://www.altexsoft.com/blog/datascience/what-is-data-engineering-explaining-data-pipeline-data-warehouse-and-data-engineer-role/