

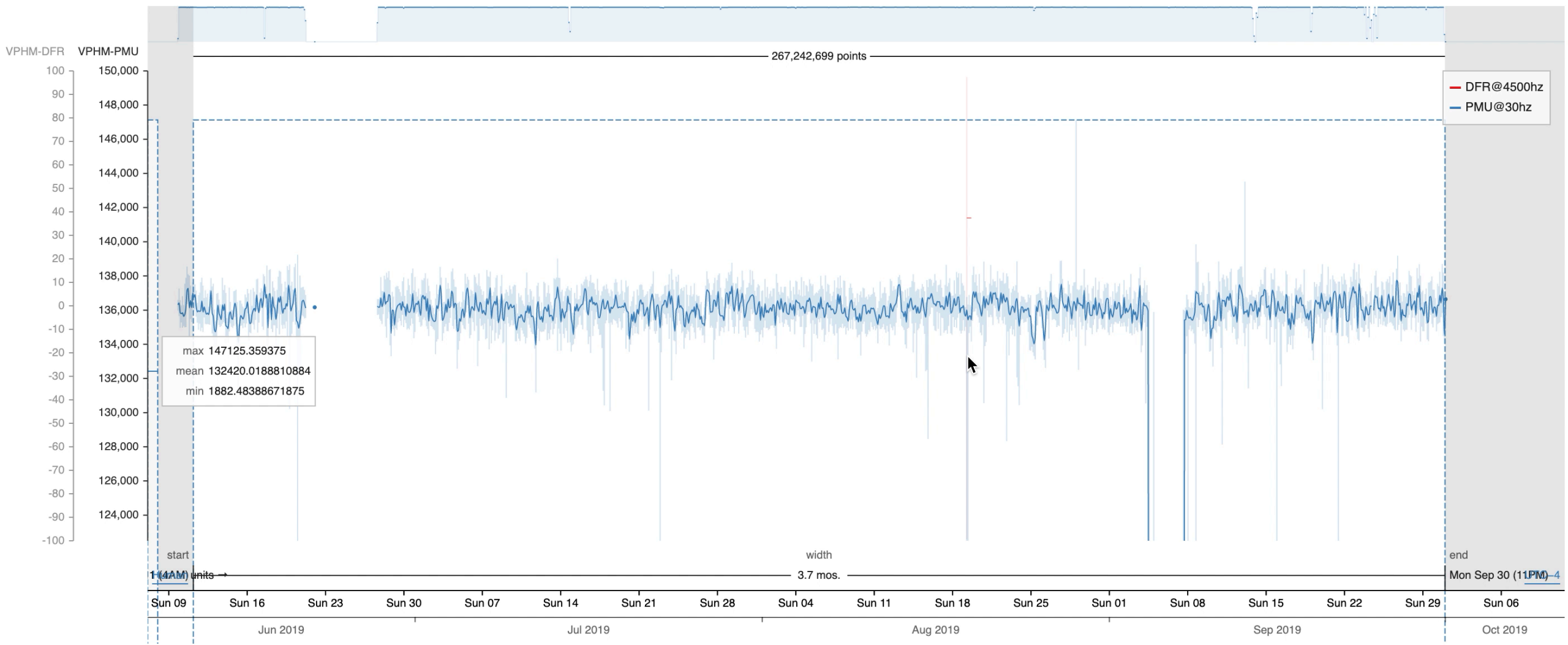
Considerations for Working with Time Synchronized Measurements from Disparate Sources

NASPI Panel Session:

Time Synchronized Measurements from Disparate Sources

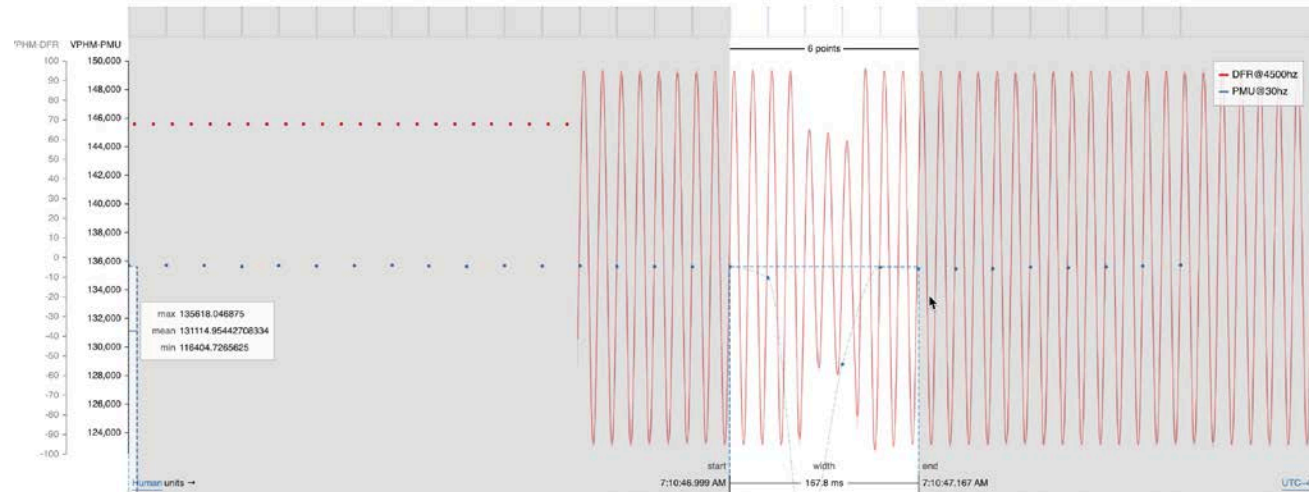
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Kevin D. Jones, Ph.D.



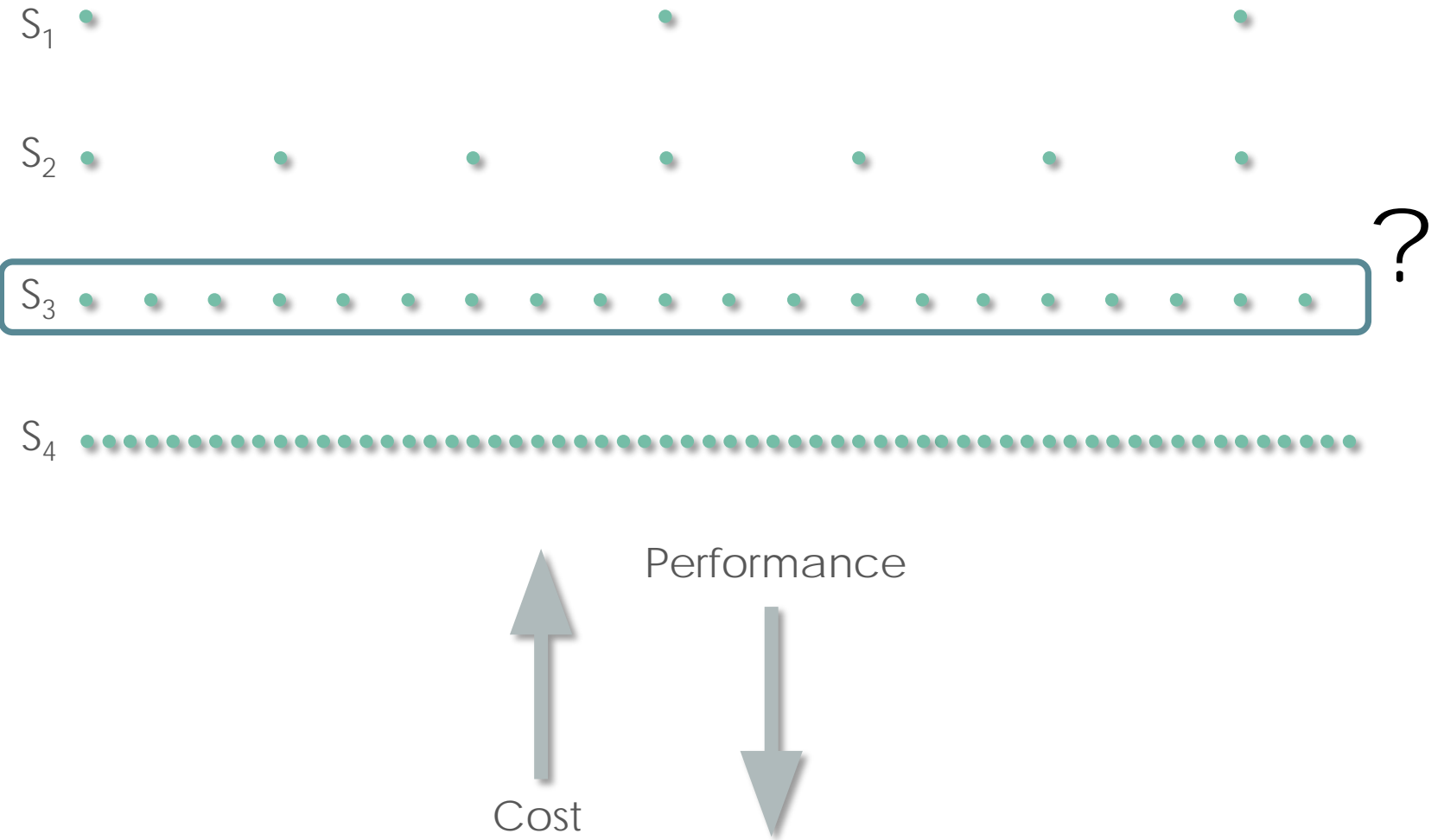
Never Enough Time

- How "time" is managed is very important.
- The underlying data store must be able to **partition and index time** at sufficiently high resolution to accommodate various **densities** and **precisions** of measurements.
- Multi-resolution visualization and query of data is required.



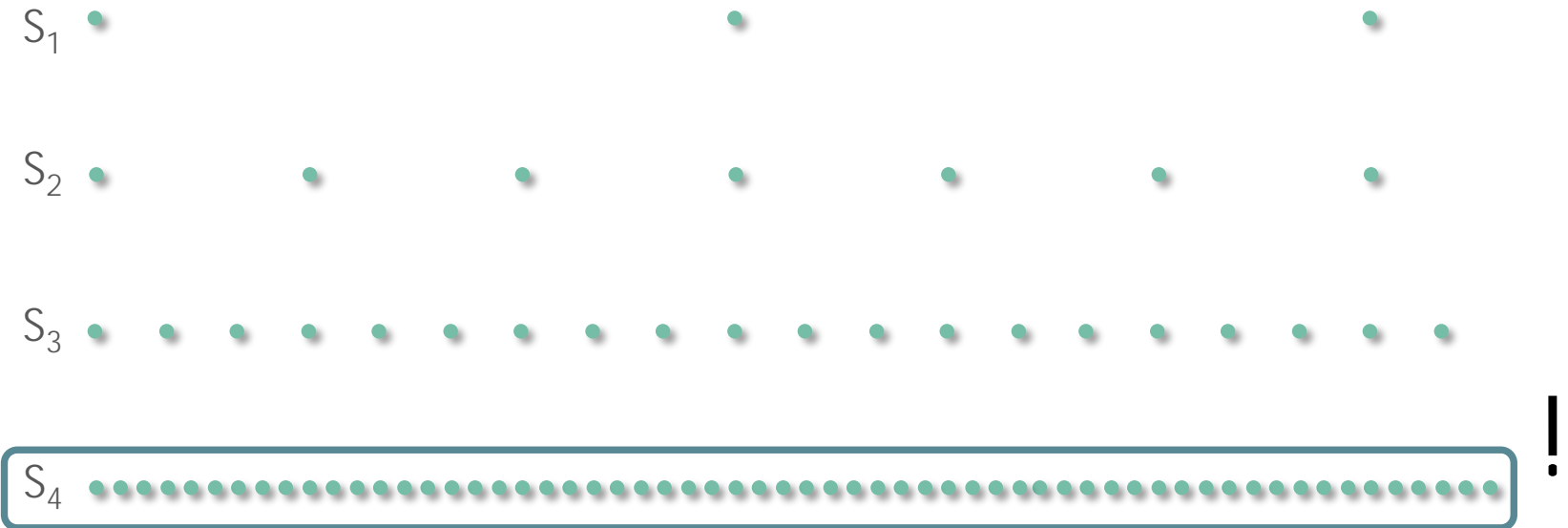
Solve for
the Most
Complex
Use Case(s)

Example: Let's Consider **VELOCITY**



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Example: Let's Consider **VELOCITY**



The same case can be made for
VARIETY and **VOLUME**

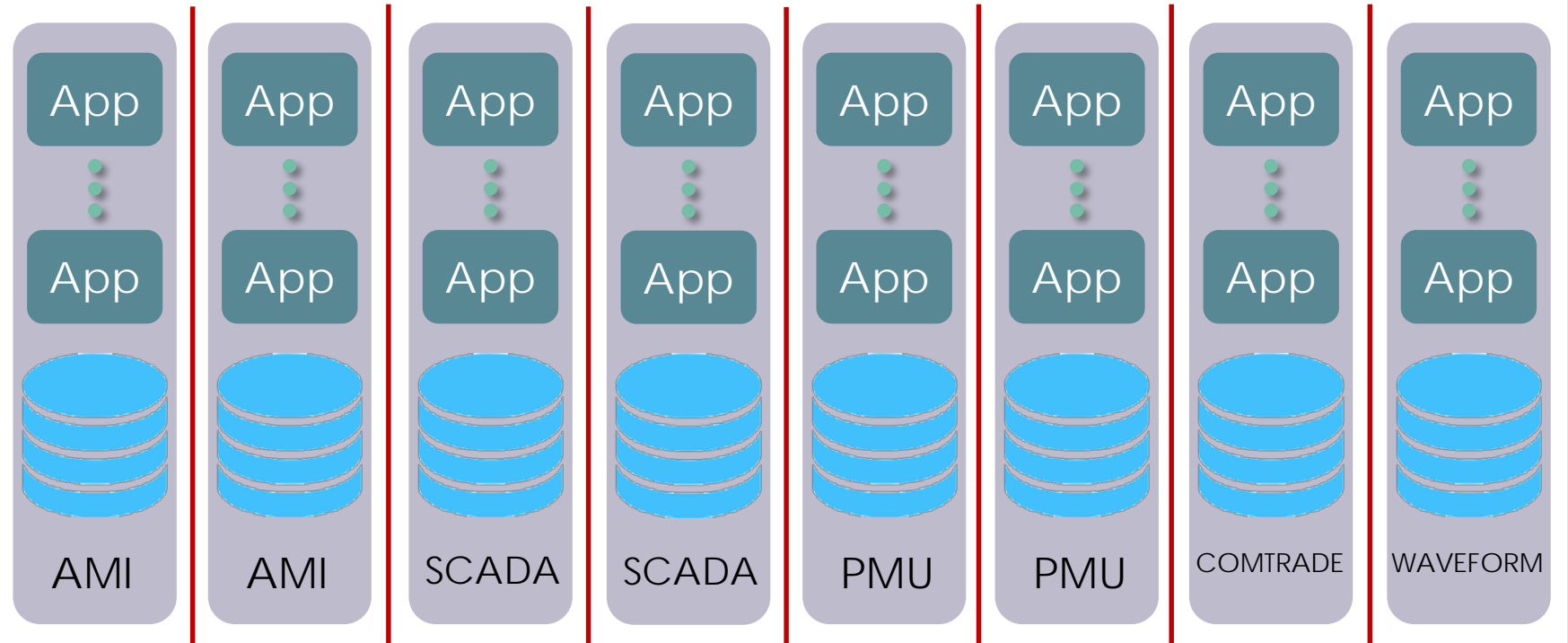
The Anti-Silo Anti-Pattern:

*"One Place
for All Your
Data"*

- We want to solve for the most complex use case(s)... **but there is a catch!**
- Workflows → Systems **NOT** Systems → Workflows
- Data can be where it needs to be when it needs to be
- i.e. **The Right Tool for the Job**

The Anti-Silo Anti-Pattern:

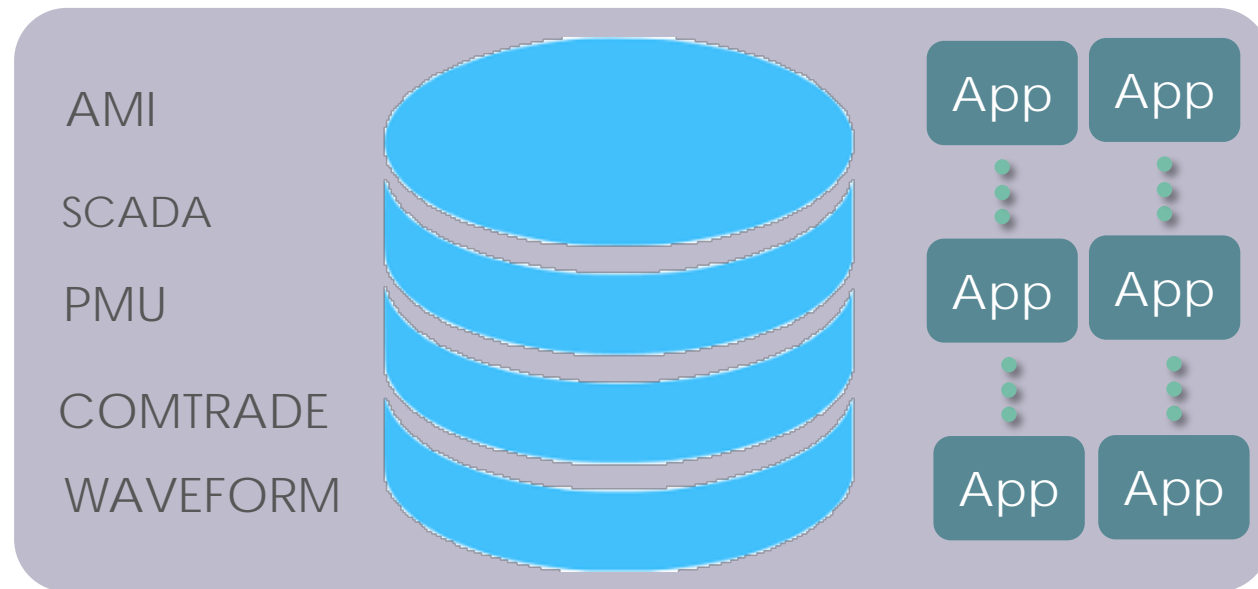
*"One Place
for All Your
Data"*



Yes, we know this is **bad**...

The Anti-Silo
Anti-Pattern:
*"One Place
for All Your
Data"*

But this can be bad, too...



The Anti-Silo Anti-Pattern:

*"One Place
for All Your
Data"*

- For example, consider the disparity of computational challenges in the following scenarios:
 - Control Room / Situational Awareness
 - *i.e. the last 15 minutes*
 - Historical Analysis of Engineering Metrics
 - *All of Time but Serially Processed*
 - Machine Learning & Deep Learning Analytics
 - *All of Time All at Once*

Use Math,

Crunch
Numbers,

Algorithms!

- **Consider which part of the stack or pipeline that it will be best to “solve” the issues** associated with variable resolution, disparately sourced data.
- Issues working with data will vary based on the use case(s)
- Ask, “Can this be addressed algorithmically?”
 - *Historically* → State Estimation
 - *Example* → Resampling
 - *Context* → Data Wrangling

Questions?

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