

Real World Experiences and Benefits with a Next Generation Data Platform for Synchrophasors

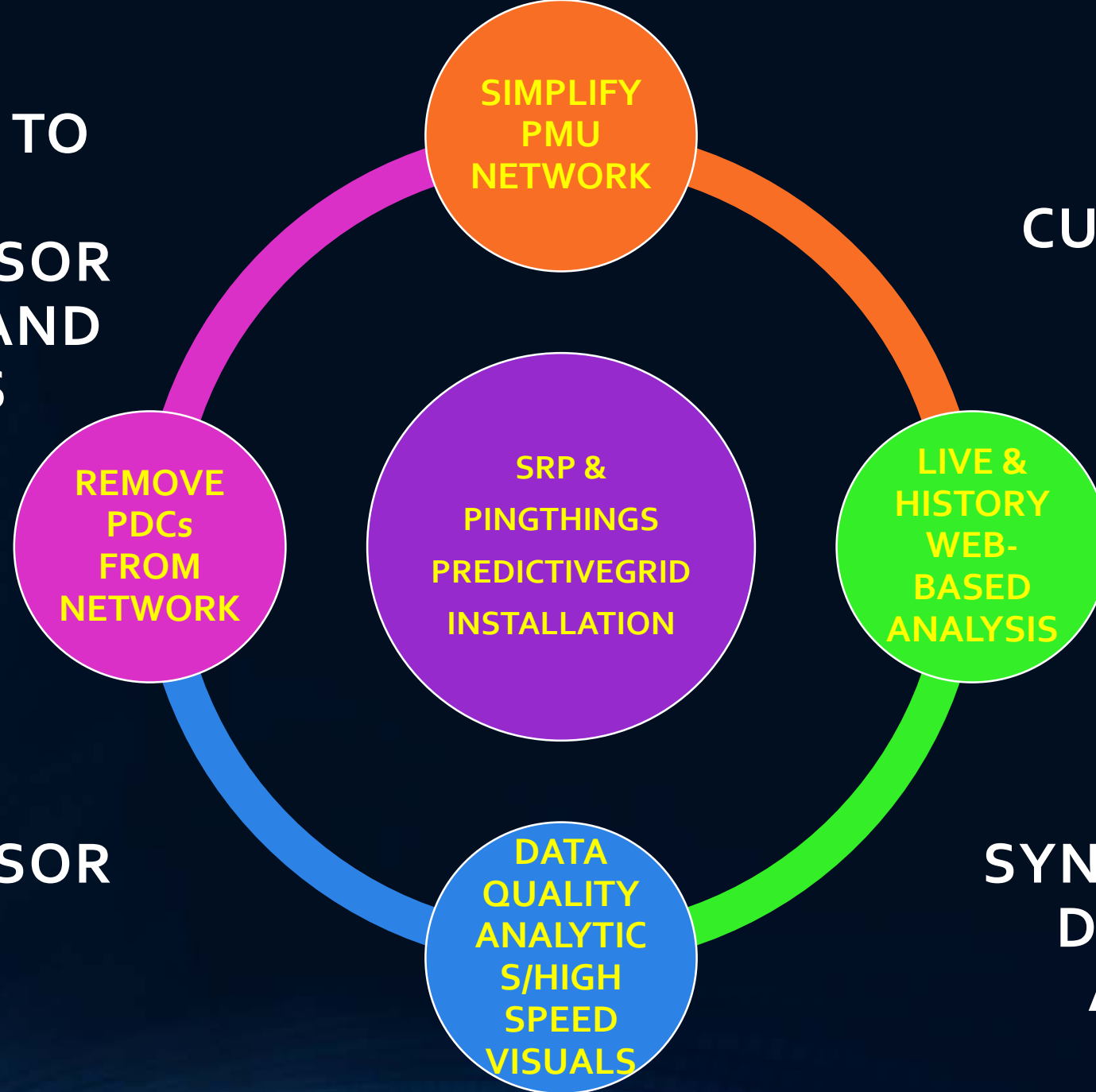
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NASPI – FALL 2018
PHILADELPHIA, PA

**SRP MOVITVE TO
IMPROVE
SYNCHROPHASOR
COLLECTION AND
ANALYTICS**

**BUILD A
CUSTOMIZABLE
SOLUTION**

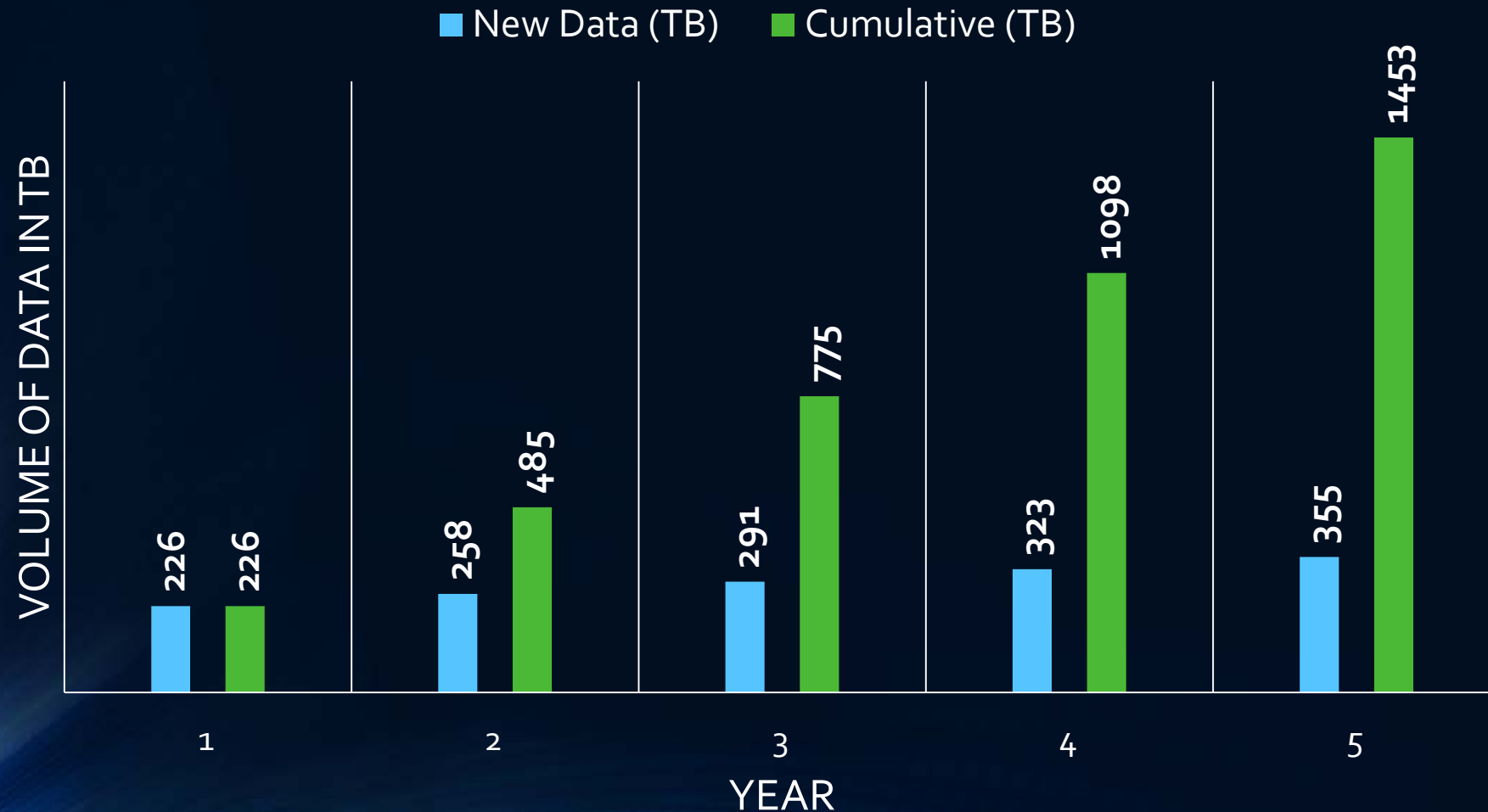
**DEVELOP
SYNCHROPHASOR
TOOLS
FASTER**

**OPEN
SYNCHROPHASOR
DATA TO ANY
ANALYTICS**

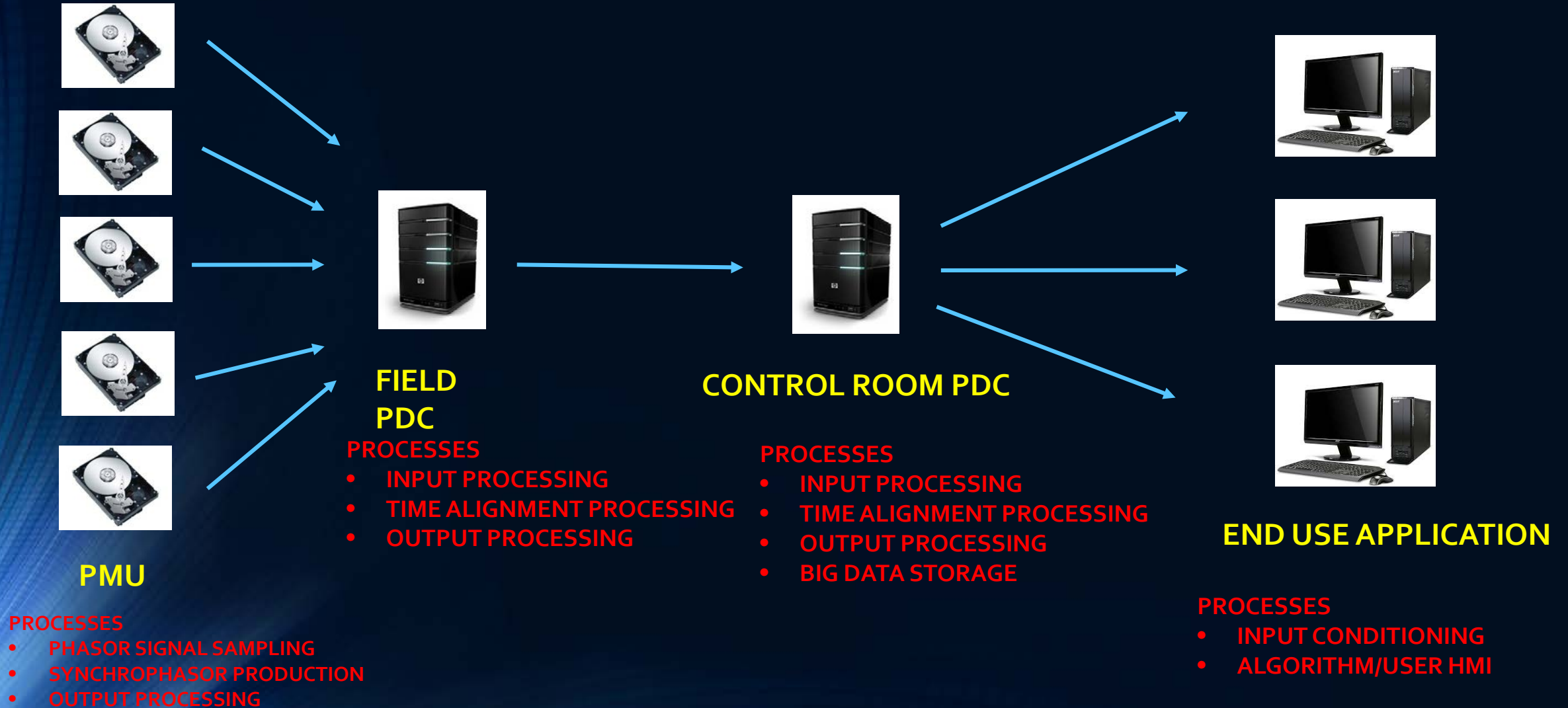


SRP's Growing PMU Data Volume

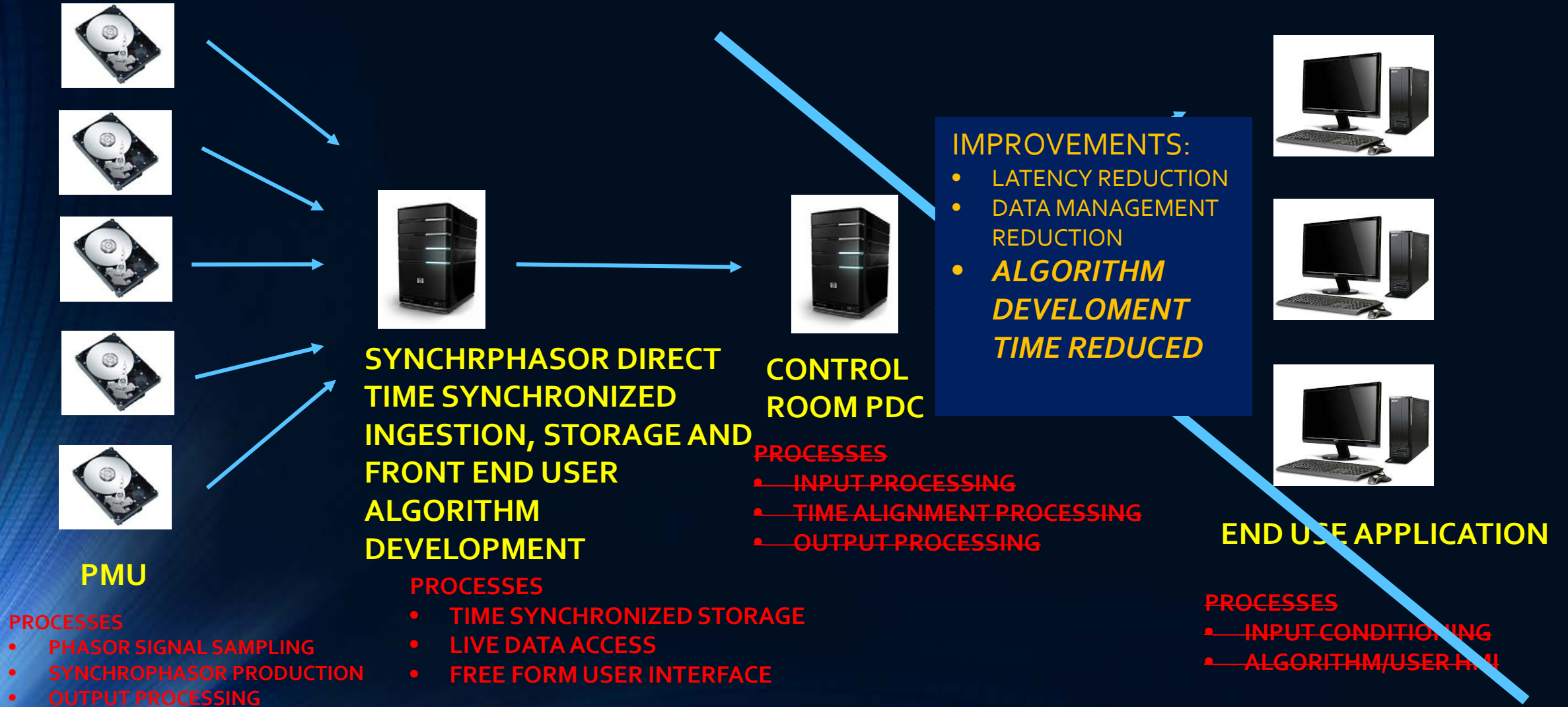
TOTAL PMU DATA PER YEAR



EXISTING NETWORK ARCHITECTURE



NEW NETWORK ARCHITECTURE



BUILD ALL MANAGEMENT/VISUAL/ANALYTICS ON ONE PLATFORM

SIMPLIFY SIGNAL ADDITION



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graph TD; A[SIMPLIFY SIGNAL ADDITION] --> B[UNIVERSAL PMU SIGNAL RENAMING]; B --> C[DATA QUALITY -STREAM&SIGNAL LEVEL]; C --> D[OPEN DATA ANALYTICS WEB CLIENT]; D --> E[HIGH SPEED VISUALIZATION];
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UNIVERSAL PMU SIGNAL RENAMING

DATA QUALITY -STREAM&SIGNAL LEVEL

OPEN DATA ANALYTICS WEB CLIENT

HIGH SPEED VISUALIZATION

PREDICTIVE GRID ROADMAP

6 MONTHS

OPEN
ANALYTICS

EVENT
DETECTION
USING PMU
DIGITALS

DIFFERENTIAL
DISTANCE
MAP

3 MONTHS

DATA
QUALITY
STREAM
LEVEL/SIGNAL
LEVEL
DYNAMIC
DISTILLERS

ASSET
RENAMING

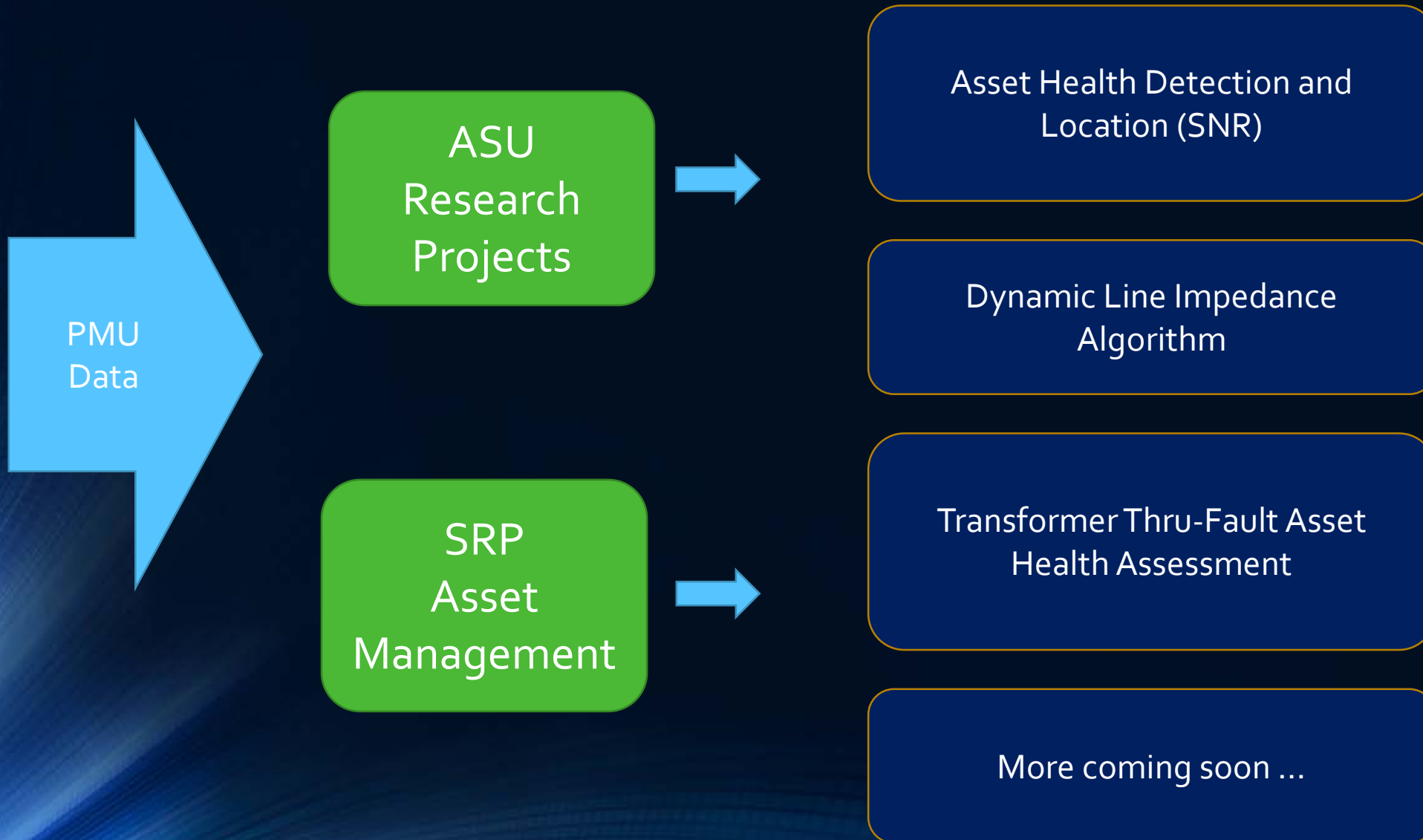
NOW

BASIC
VISUALIZATION

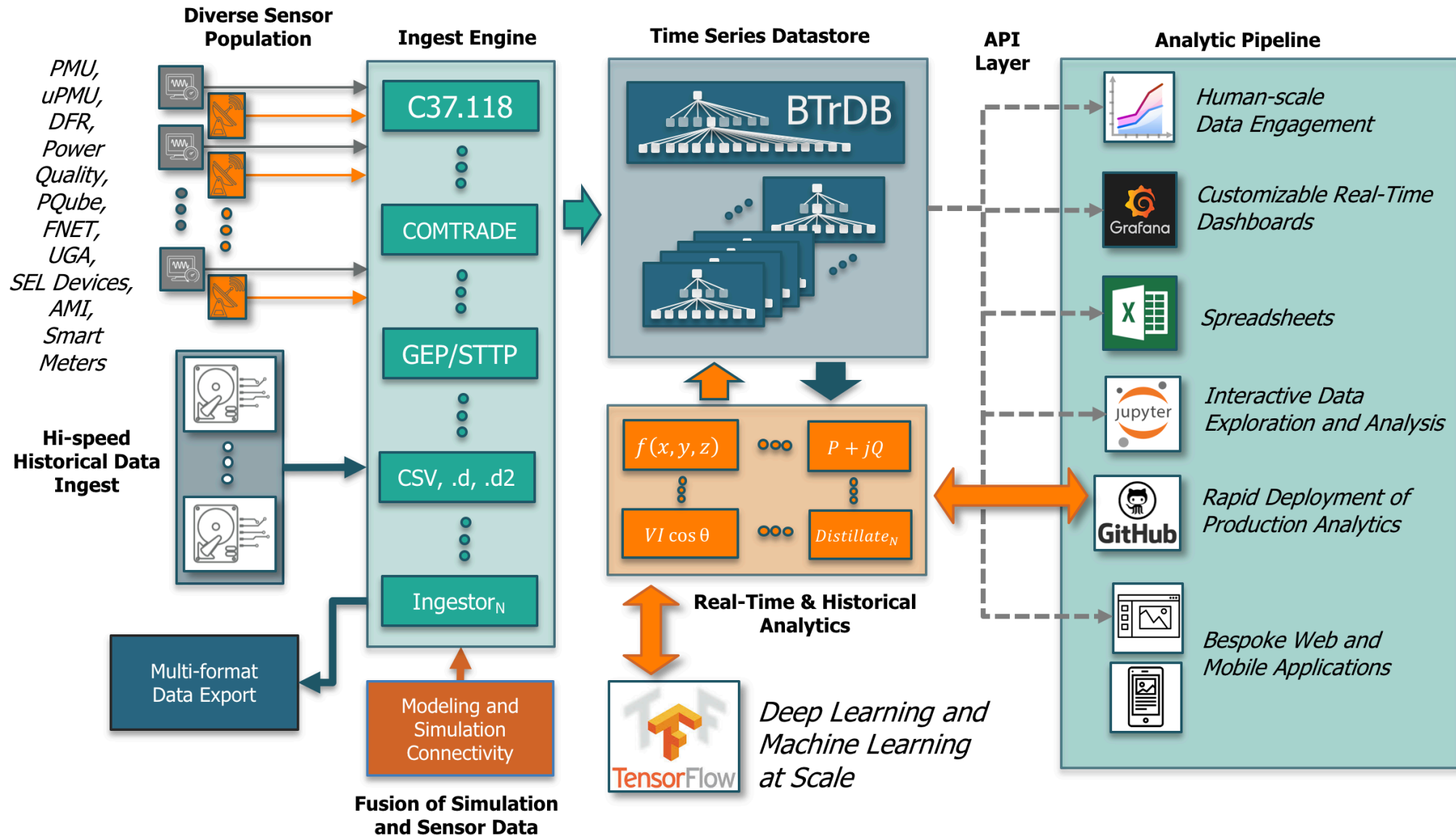
ADVANCED
.CSV BULK
INGESTION

MANUAL DATA
INGESTION

SRP Projects Moving onto Platform



The PingThings PredictiveGrid™ Platform Intro



SRP/PING THINGS

PredictiveGrid™ SERVER FEATURES

- STRUCTURE
 - Compute and storage fabric are separate, independently scalable.
 - If a disk or compute node fails, system continues operating and recovers gracefully.
 - Storage is easy and inexpensive to add, capable of supporting multi-Petabyte installations.
- HIGH CUSTOMIZABILITY OF PLATFORM
 - Can be configured for utilities and organizations of virtually any size with wildly different analysis and storage requirements.



SRP/PING THINGS

PredictiveGrid™ SERVER FEATURES

Ease of Signal addition - Create .CSV file of PMU ID, IP address and Port

PingThings

Logout

Home / Device Manifest

DEVICE MANAGEMENT

Add/Remove Devices

Current Device List

Ingest Method	ID/Serial	Path	IP:Port	Metadata
c37-118.pdc	102	SRP/c37		
c37-118.pdc	124	SRP/c37		
c37-118.pdc	125	SRP/c37		
c37-118.pdc	171	SRP/c37		
c37-118.pdc	17	SRP/c37		
c37-118.pdc	198	SRP/c37		

Proposed Changes

Add Devices via CSV

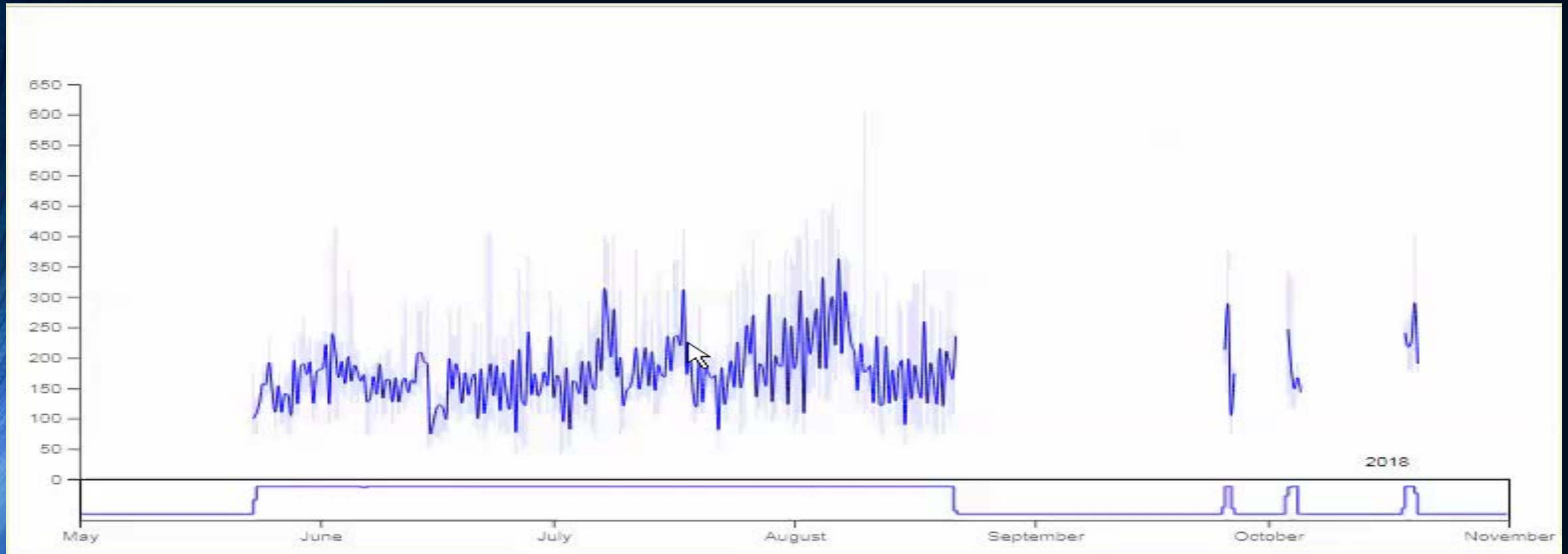
Discard All Save 0 changes

Ingest Method	ID/Serial	Path	IP:Port	Metadata

SRP/PING THINGS

PredictiveGrid™ SERVER FEATURES

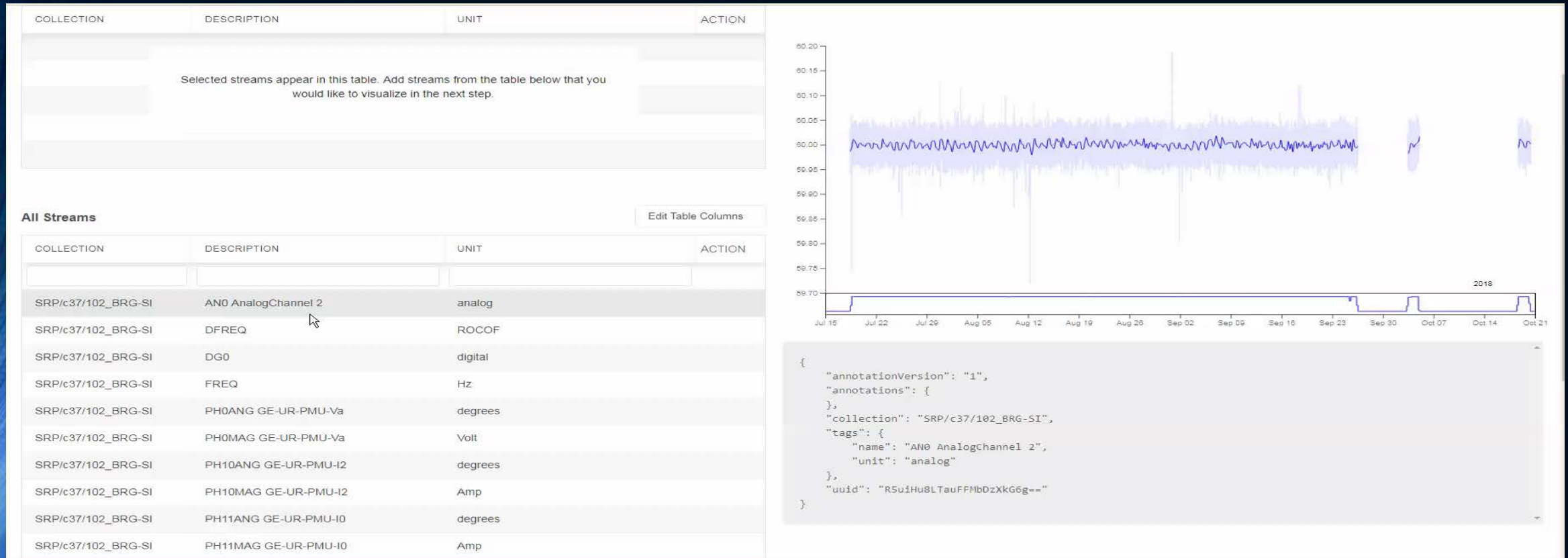
High speed input visualization – Select Signals to view in side window and zoom down to data point in seconds.



SRP/PING THINGS

PredictiveGrid™ SERVER FEATURES

High speed customized view – Select signals for customized view and zoom down to data point in seconds.



SRP/PING THINGS

PredictiveGrid™ SERVER FEATURES

DATA QUALITY TRENDS WITH HIGH SPEED VISUALIZATION.



SRP/PING THINGS

PredictiveGrid™ SERVER FEATURES

WEB-CLIENT BASED JUPYTER NOTEBOOK FOR ANALYTICS INSERTION.



CONCLUSIONS

- SRP SOUGHT TO REDUCE THE DATA LATENCY AND DATA MANAGEMENT TIME WITH A STREAMLINED NEW ARCHITECTURE
- SRP DISCOVERED THAT DATA VISUALIZATION, DATA QUALITY REPORTING AND ADVANCED ANALYTIC DEVELOPMENT IS POSSIBLE WITH NEW ARCHITECTURES THAT PING THINGS PredictiveGrid™ PROVIDES.
- PLATFORM INSTALLATION, FAST VISUALZATION, BULK SIGNAL ADDITION AND BASIC DATA QUALITY HAS ALREADY BEEN DESIGNED INTO A HIGHLY CUSTOMIZABLE PLATFORM.
- NEXT STEPS WILL INCLUDE ADVANCED DATA QUALITY ANALYSIS AND REPORTING, REAL-TIME VISUALIZATION AND ONLINE DATA ANALYTICS WEB CLIENT MODULE.
- ONE PLATFORM FOR ARCHIVING, VISUALIZATION, DATA QUALITY AND ANALYTICS.

The background is a dark blue gradient. On the left side, there are several bright blue, curved light streaks that sweep upwards and outwards, creating a sense of motion and depth. The rest of the background is a solid, dark blue.

QUESTIONS