

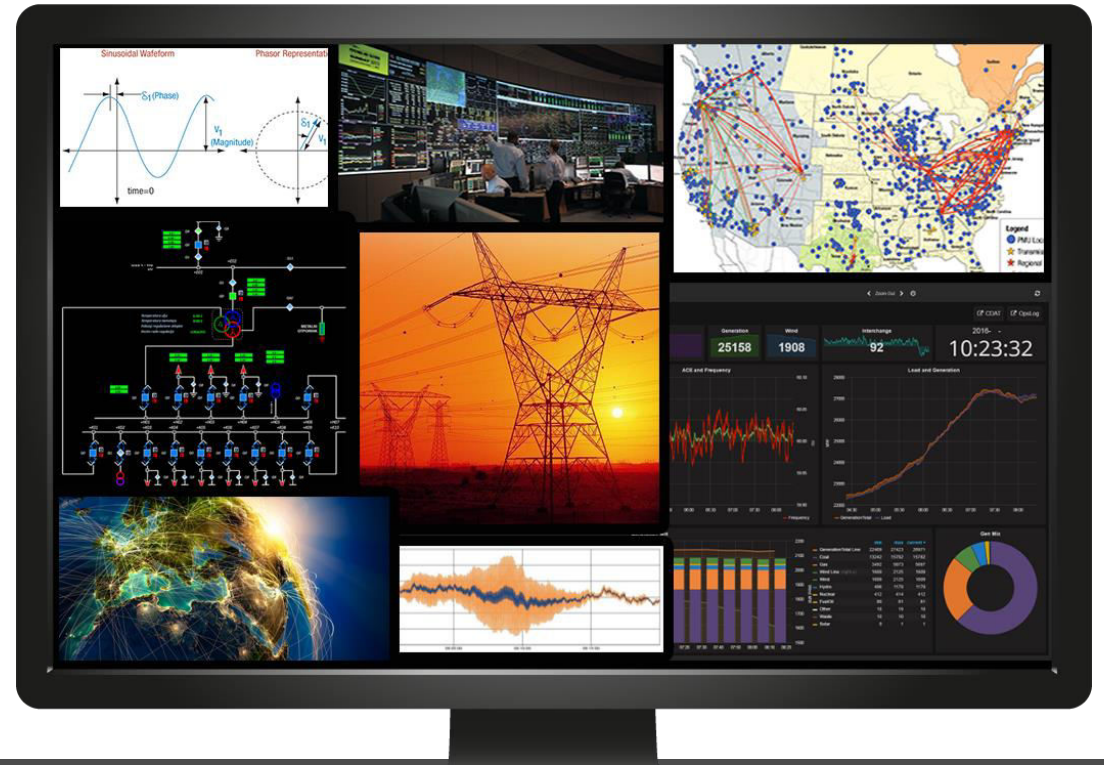


# The new IEEE Standard for the Streaming Telemetry Transport Protocol (STTP)

# Agenda

Technical Intro to STTP (Ritchie Carroll, GPA)  
STTP as IEEE standard (Ken Martin, EPG)  
STTP Security Features (Scott Mix, PNNL)  
STTP at Dominion (Kevin Jones, Dominion)  
STTP at SDG&E (Jared Bestebeur, SEL)  
STTP at SPP (Mike Nugent, SPP)  
STTP at ComED (Mike Brown, PingThings)

# STREAMING TELEMETRY TRANSPORT PROTOCOL



## Humble Beginnings

NASPI Meeting

J. Ritchie Carroll  
April 5, 2023

# IEEE P2664



# How Did We Get Here?

- **Original Streaming Data Flows:**
  - All configured data broadcast from point A to point B
- **Common Issue:**
  - Bandwidth / processing overload
- **Information Needs:**
  - Commonly a visualization or computation only needs certain data
- **Idea for Solution:**
  - Find a way to only “subscribe” to desired data
- **Problem -- No Protocol Did This:**
  - ***Invent one!***



# From GEP...

- The “*invented*” protocol started as the “**Gateway Exchange Protocol**” (GEP)
- Early on, many utilities invested time, energy and funding into helping flesh out the needs for this new Pub/Sub protocol – *here’s a few*:
  - **Entergy / Dominion / TVA**
  - **SDG&E / Peak RC / SOCO**
  - **SPP / OG&E / MISO / PJM**
- ***Thankless and unacknowledged*** countless hours went into this initial testing and development – the industry owes the existence of this new protocol to these key players!

# To STTP...

## ■ US DOE Project

- Helped fund effort to develop and standardize STTP

## ■ Industry Recognized Need

- Many partners assisted >>

## Advanced Synchrophasor Protocol Project

sttp



DOE FOA 1492  
DE-OE0000859

ASP

Streaming Telemetry Transport Protocol



GRID  
PROTECTION  
ALLIANCE



WASHINGTON STATE  
UNIVERSITY



Electric Power Group



SCHWEITZER  
ENGINEERING  
LABORATORIES



Southwest  
Power Pool

OG&E



SDGE



Dominion  
Energy



Utilicast



PEAKRELIABILITY  
assuring the wide area view



SOUTHERN CALIFORNIA  
EDISON

ercot



new england

SOUTHERN  
COMPANY

EPRI

ELECTRIC POWER  
RESEARCH INSTITUTE



USC University of  
Southern California



OSIsoft



BRIDGE  
ENERGY GROUP

SPACE-TIME  
INSIGHT

PingThings



T&D  
Consulting Engineers

MEHTA TECH, INC.



# Destination: IEEE

**sttp** →  **IEEE P2664**

- Atomic Measurement Packets
- Reduced Data Loss
- Lossless Compression
- Scalability (to hardware limits)
- Publish / Subscribe Model
- Publisher Data Access Control
- IP Level Security
- Configurable Connection Origin

# API Status

	Subscriber	TSCC	Filter Expressions	Reverse Subscriber	Publisher	Reverse Publisher	TLS
GSF	✓	✓	✓	✓	✓	✓	✓
C++	✓	✓	✓	✓	✓	✓	
Go	✓	✓	✓	✓			
Python	✓	✓	✓				
Rust	✓	<i>Ongoing progress on STTP API language targets...</i>					

■ All API language targets expected to be function complete by end of year in time for IEEE release

■ However, no need to wait, ***start integrating now!***

**sttp.info**



# Chose one and go!

<https://github.com/sttp>

Streaming Telemetry Transport Protocol



**Python STTP Implementation**

<https://github.com/sttp/pyapi>



**Go STTP Implementation**

<https://github.com/sttp/goapi>



**.NET STTP Implementation**

<https://github.com/sttp/dotnetapi>



**C++ STTP Implementation**

<https://github.com/sttp/cppapi>



**STTP Connection Tester**

<https://github.com/sttp/connection-tester>

## Open Source

All STTP reference implementations are Open Source Software (OSS) published on GitHub under the permissive MIT license.

