EIDSN’s Purposes

• Facilitate an efficient, effective and secure network for the sharing of operating reliability data among its members and participants.

• Promote the reliable and efficient operation of the Bulk Electric System (BES) through use of Electric Information Network (EInet).

• Currently includes sharing both SCADA and synchrophasor data among appropriate entities.

• Facilitate the adoption, development and support for various software tools for members and participants that promote the reliable and efficient operation of the Bulk Electric System.
Joining EIDSN, Inc.

• Nonstock, nonprofit corporation - 501(c)(6)

• In early 2018, EIDSN’s Board of Directors approved the removal of the geographic restriction for joining the Company
  – Any NERC designated Reliability Coordinator (RC), Transmission Operator (TOP), Transmission Owner (TO), and Balancing Authority (BA) in North America can join as Member or Participant

• Agreements requiring execution
  – Master Confidentiality Agreement
  – Network Service Agreement
  – Member OR Participant Agreement
EInet & Synchrophasor Data

• A growing number of EInet node owners are sharing production synchrophasor data with partners across EInet
• TVA is one of the more recent members to share
• Initial TVA experiences and questions spawned discussions within the Technical Committee and effort to canvas members to understand bigger picture
  – Who is sharing with who?
  – Which other members are contemplating synchrophasor data exchange?
  – Bandwidth consumption forecasts and monitoring
  – # of phasors/PMU’s and types in scope by company
  – Data Retention period (compressed and uncompressed)
EInet & Synchrophasor Data

Current Usage Findings to Date

• Various companies were polled and responded with privileged information that can be summarized here

• There are a wide variety of data types, asymmetrical flows, and retention policies.

• Approach is different per company/ISO based on the relevant need, and even may be different depending on external or internal endpoint.
  • E.g. TVA external traffic positive sequence only, internal is sent with all phases

• Bandwidth can be an issue as can be naming conventions
Potential Next Steps Under Review

Protocol Change Options
- C37.118 is not efficient in this use case (a pmu per signal)
- Potential optional use of STTP (Streaming Telemetry Transport Protocol)
  - Pros – less bandwidth intensive (TCP with STTP lossless compression), design better suited for publish/subscribe use case relevant here
  - Cons – vendor software support? (proposed IEEE standard 2664)

Possible Architecture Considerations
- Duplicate traffic is common on a many to many topology
- Hub and Spoke Topology could allow for more efficient transfer of measurements with minimal duplication
- Central hub concept would need to be fully vetted however

<table>
<thead>
<tr>
<th>Feature</th>
<th>IEEE C37.118</th>
<th>IEC 61850 90-5</th>
<th>STTP</th>
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<tr>
<td>Structure</td>
<td>Frame</td>
<td>Frame</td>
<td>Dynamic</td>
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<tr>
<td>Efficiency</td>
<td>Good</td>
<td>Fair</td>
<td>Excellent - TCP Fair - UDP</td>
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<td>None - TCP</td>
<td>None</td>
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<td>Low - TCP Some - UDP</td>
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