North American SynchroPhasor Initiative (NASPI)

Data and Network Management Task Team (DNMTT)

PDC Configuration Workshop

March 10, 2014
2:00 pm – 5:00 pm EDT

Holiday Inn Knoxville Downtown World's Fair Park
525 Henley Street
Knoxville, TN 37902

NEXT STEPS

1. Review email that was sent from Allison with the guidelines that were published by the IEEE
2. Dan will be sending out the PowerPoint with the illustration of the "buses"
3. Notes from the session will be going out to all the participants.
4. Any feedback we get from this group will be going out to the major vendors asking them whether they are going to support some of these concepts or if the functionality already exists, please let us know how these concepts are being accounted for within their products.
5. We would like to produce a checklist that utilities could use when discussing some of these concepts (maybe an FAQ) with vendors or potential vendors.

ACTION ITEMS AND AGREEMENTS

CONTACT INFORMATION

Data and Network Management Task Team

- Co-Chairs
  - Dan Brancaccio, Bridge Energy Group, dbrancaccio@bridgeenergygroup.com
  - Jim McNierney, NYISO, JMcNierney@nyiso.com
- DNMTT Website: http://www.naspi.org/meetings/dnmtt/dnmttmeetings.stm

MINUTES

Today's PDC Configuration Workshop meeting was led by Dan Brancaccio

Scribe: Jim McNierney

Current Items:

Goal of the workshop:

1. Standard terminology or nomenclature for PDC configuration options

2. Alert vendors to the need to normalize PDC configuration options across platforms
3. Improve clarity and ease of use in PDC configuration
4. Discussion on the need to develop a guideline for PDC meta-data exchanged among PDC's

Coordination with IEEE PSRC C19 Working Group

- Two IEEE working groups that are working on PDCs
- Standard for PDC development
    - Face to face meeting to take place in Ft. Lauderdale in May
    - Data format and coordinate conversions
    - Note that there is a terminology differences among vendors
    - Differences within configuration manager user interface

Latency and Wait times need to be in synch with the application needs. The original NASPInet spec attempted to provide for multiple classes of PMUs with different Use Cases for each class. We might be well advised to revisit those class definitions in attempting to give some guidance on what parameters should be used when supporting different types of applications.

C37.118 protocol limitations

16 character Signal Names

- Naming convention was developed and brought to NASPI by Mahendra Patel - EPRI (then with PJM). This naming convention was based on the C37.118 – 2005 standard
- This naming convention was adopted by WECC / PEAK RC
    - Some vendor PDC configuration managers didn't allow you to rename the signals that were being broadcasted by the PMU in the fields.
    - Some vendors permitted more flexability in renaming signals outbound from the PDC
    - Created a hardship when trying to normalize data streams coming from different organization that had deployed certain vendor products.
- WISP receives data from 17 other participants in the west and this data is coming from a varied array of vendors products. WISP was receiving a widely variant delay/lag from these different source products
    - Tools simulating PMUs run all too clean. Computers have a hard time simulating what is actually being received "in the wild."

- Vendors use different terms referring to common configuration parameters
- Lag time –OpenPDC, EPG – Wait time, Schweizer – Wait period,
    - Different vendors not only call it something different while providing for very different methods to either disable or to modify this parameter.
- Couldn't find "Lag time" or other parameters ("Pre-emptive publishing) that matched what WECC's vendors had used in their PDC products (OpenPDC). Discussion around what constitutes a PDC (data acquisition and time alignment) all other functions are separate (analytics / historian).
- Preemptive publishing
    - Allows the system to preemptively publish frames before the lag time expires assuming all expected data has arrived
- Lead Time setting
    - Defines the maximum time, in seconds, that the PDC will tolerate for measurements that arrive with a future timestamp as compared to "real-time."
- Other uses of PDCs
    - PMU routing – Route particular signals to different locations. Customized output streams (to RC to internal visualization functions)
    - Correlation of the data occurs at this point. This sometimes means that some data will be buffered and in some cases lost in order to do the time correlation that we are asking the device to perform.

Clocking

- WISP / PEAK RC was receiving data from one of their participants that had a long wait time configured because the participant was having issues keeping the system clocks on their various PDCs in synch. (Using Microsoft Windows NTP functions).

PDC vendor platform differences

- Cooper – Sybetech – (Windows)
- Schwietzer has different flavors of PDC products
    - Proprietary Hardware 3373 (Linux) and Windows
- OpenPDC – GPA / Alstom (Windows but, ready to port to Linux)

- ePDC – Electric Power Group (Windows / Linux)
- PhasorPoint has an internal PDC product (Windows / Linux)
- Siemans – Siguait (SP?)
- GE has a couple of different products
- ABB?

Other terms being used

- SuperPDC – receives data from other PDCs and not directly from a PMU
    - Do we need to make this distinction is there any value in

Question: Communications protocol is determining factor. With UDP, there is no ability for the device to know (non connection based protocol) when communication paths are not available between devices.

- For some situations, there is little value to retrieve "old" data. In a post event analysis, this could be very valuable
- Would like to see vendors provide a mechanism to request data, in the event of a communications failure, out of band. Currently no support in products or standards.
- If there was a device ahead of the PDC that would not be doing time alignment that could receive data out of sequence, perhaps this is a solution.
- There are things be worked on within PRC standard that might suggest that the PMU functionality should be accomplished by a DFR to cover the event analysis (locally like a DFR) while also streaming data for real time or historian functions for application use.
- Synchrophasor standard functions are defined in the IEE standard
- C37.118.2 standard doesn't support aggregation without time alignment

A lot of organizations are using PDCs as "intelligent routers" because we are still working with more point to point communications pathways as opposed to more of a publish and subscribe paradigm.

Question: Are software PDC better than dedicated appliance PDC?

- Scalability is sometimes a determining factor in that decision

IEEE Std C37.244-2013 (still being developed within C19) has a lot of data definitions and terminology that has been accepted as part of the standard.

- Wait time is defined in the guide which kind of means that “Wait Time” is the accepted term.

- We (NASPI) are looking to compile some commentary to this published guide document to give to the IEEE through the PSRC C19 working group

- We would like to ask what vendors support this standardized terminology within their current products and which ones do not. We should encourage all vendors to work on incorporating these accepted terms into their configuration interfaces.

- We are encouraging the IEEE to include these definitions to be part of the standard because this would give end users leverage in discussions with vendors that they aren’t in compliance with the standard. If the definitions remain in some appendix, that might lead to “wiggle room” for the vendors.

We would like to put together a document outlining these terms to send to the PDC vendors that asks them to please alter their configuration interfaces to use these terms as opposed to the vendor specific terms that are in use in some of these products.

On the subject of developing a standard for configuration of PDC meta-data exchange among PDCs – Should we work with the standards organization to try to get the device specific meta data as part of the exchange.

- Is this better supported within a registry and called through APIs?

We discussed ideas around getting the pedigree of the data (which network paths and what devices have the data passed through) and agreed that this is something that would be a radical difference to the existing standards. Is this something that we think the PDC should be doing?

We discussed quality codes that might change as the data is passed along from device to device.

We also discussed “Lead Time” limits which basically will apply a reasonability limit of the time stamp that the PMU data is presenting to the PDC (i.e. future measurement?). This would basically protect against one “bad pmu” presenting a time stamp that might affect all of the other data sources being presenting to a particular PDC.