PMU

- Minimum specifications
  - C37.118 – 2005
  - 30 / 60 Frames per second
  - Firmware upgrade to C37.118-20XX
  - UDP/IP Multicast (IPv6)
  - Local Access
  - NERC CIP-002 through CIP-009
PMU (continued)

- Minimum spec questions
  - A/D sampling rate
  - UTC Synchronization
  - Sample Rate
  - Gain
  - Phase Delay
  - Phasor inputs
  - Analog inputs
  - Digital / Status inputs
  - Commissioning (IEC 61850 SCL)
PDC

● Categories
  ▪ Substation
    – Small number of PMUs
    – Rule Set and Threshold configuration
    – Local control and protection
    – IEC 61850 (Generic Substation Event GOOSE and GSSE)
  ▪ Control Center
    – Primarily concentrating data from other PDCs
    – More flexible routing configuration
PDC (continued)

Specifications

- C37.118-2005 (upgradeable)
- UDP/IP multicast (IPv6)
- Local and Remotely configurable
- Latency < 10 milliseconds?
- Concentrate 40 devices
- Scale out
Questions

- IEC 61850 (Substation Configuration Language)
- How much can we ask a PDC to do
  - Gateway
  - On the fly routing changes
  - On the fly channel filtering
  - Down sampling
  - Protocol conversion
  - Commissioning
Questions
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NASPI Work Group Meeting
February 24–25, 2010
Entity to WECC Overview

WECC RC Vancouver, WA

1. WECC PDC A1
2. WECC routers
3. Entity Control Center(s)
4. Entity PDC 1
5. Entity PDC 2
6. Entity Substation A

1. Substation LAN
2. PMU

WECC RC Loveland, CO

1. WECC PDC B1
2. WECC routers
3. Entity Control Center(s)
4. Entity PDC 1
5. Entity PDC 2
6. Entity Substation B

1. Substation LAN
2. PMU

May be in two separate physical locations

WAN

Details in the RC Data Path Diagram

Note: Data flow is shown for C37.118 Syncphasor data only. Commands will flow back to the devices over the same paths

Entity WAN

Entity

Some Substations may not have a PDC

TITLE: [DRAFT] WECC WSI SYNCHROPHASOR PATH ARCHITECTURE
DESCRIPTION: REDUNDANT / FAILOVER PATH ARCHITECTURE
DRAWN BY: DAN BRANCACCIO
DATE:

Watchdog

Data Storage Appliance

Phasor Data

Watchdog

Data Storage Appliance

Phasor Data
Questions