



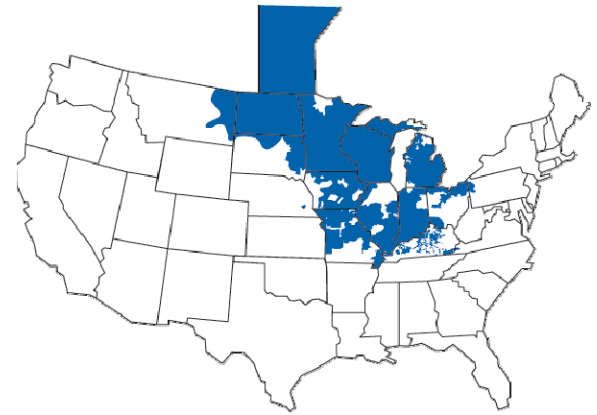
# 2012 GPA Tutorial and User's Forum

MISO Updates

# Presentation Objectives



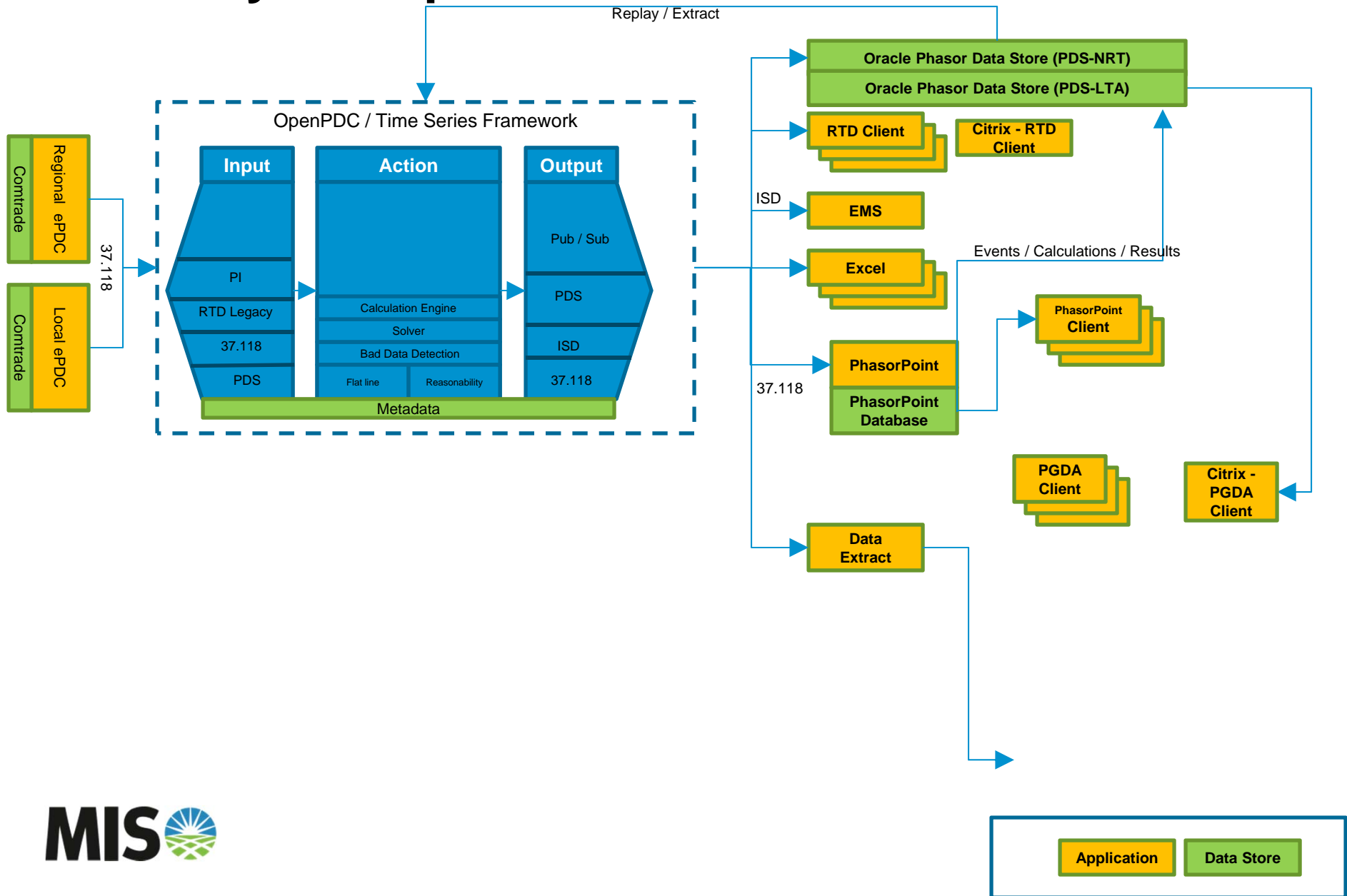
- **Project Requirements**
- **Share a quick update on MISO progress with using OpenPDC**



# MISO Requirements

- **Needed a solutions to display high speed synchrophasor data along side of other MISO data including EMS (PI) data**
- **Display data Geographically**
- **Real Time and Playback**
- **Calc Points**
- **Managed Metadata**
- **Data Quality Monitor**
- **Application Monitor**
  
- **Users – Control room, RT Engineers, AFT analysis, Members**

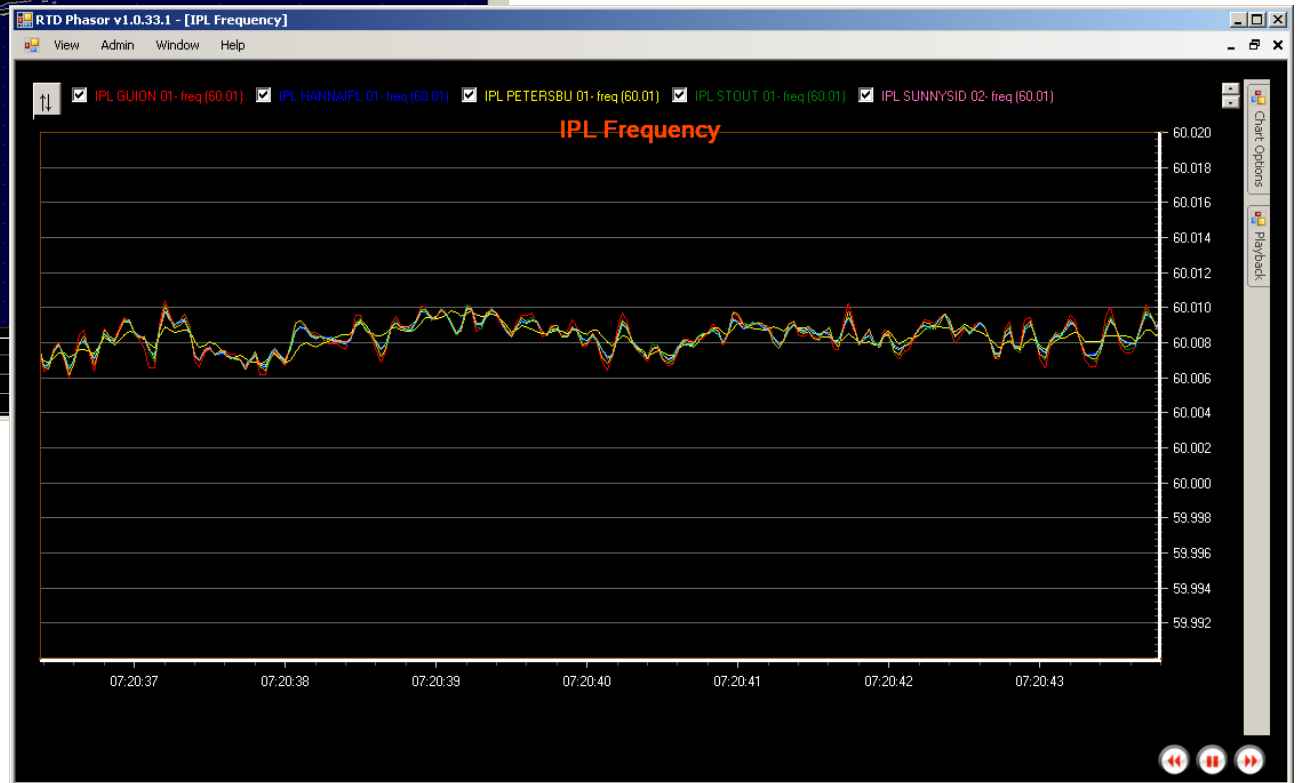
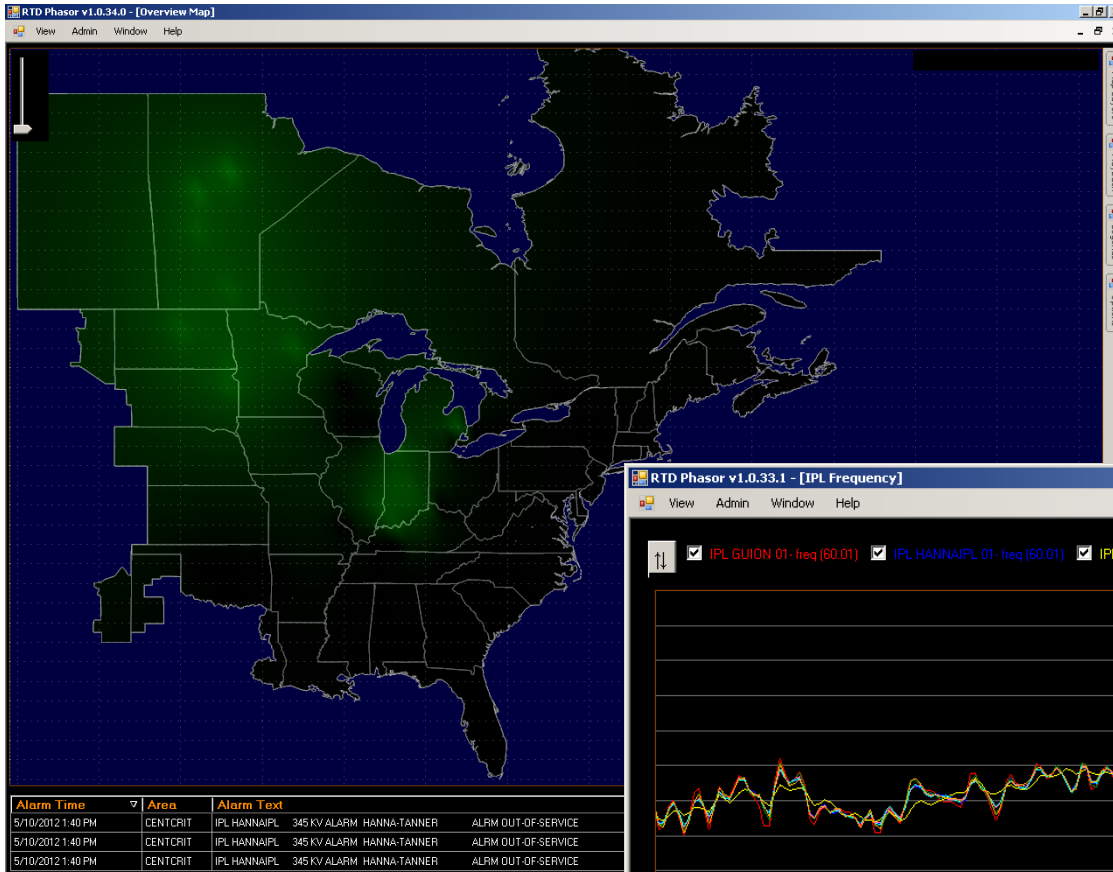
# MISO Synchrophasor Architecture



# Update

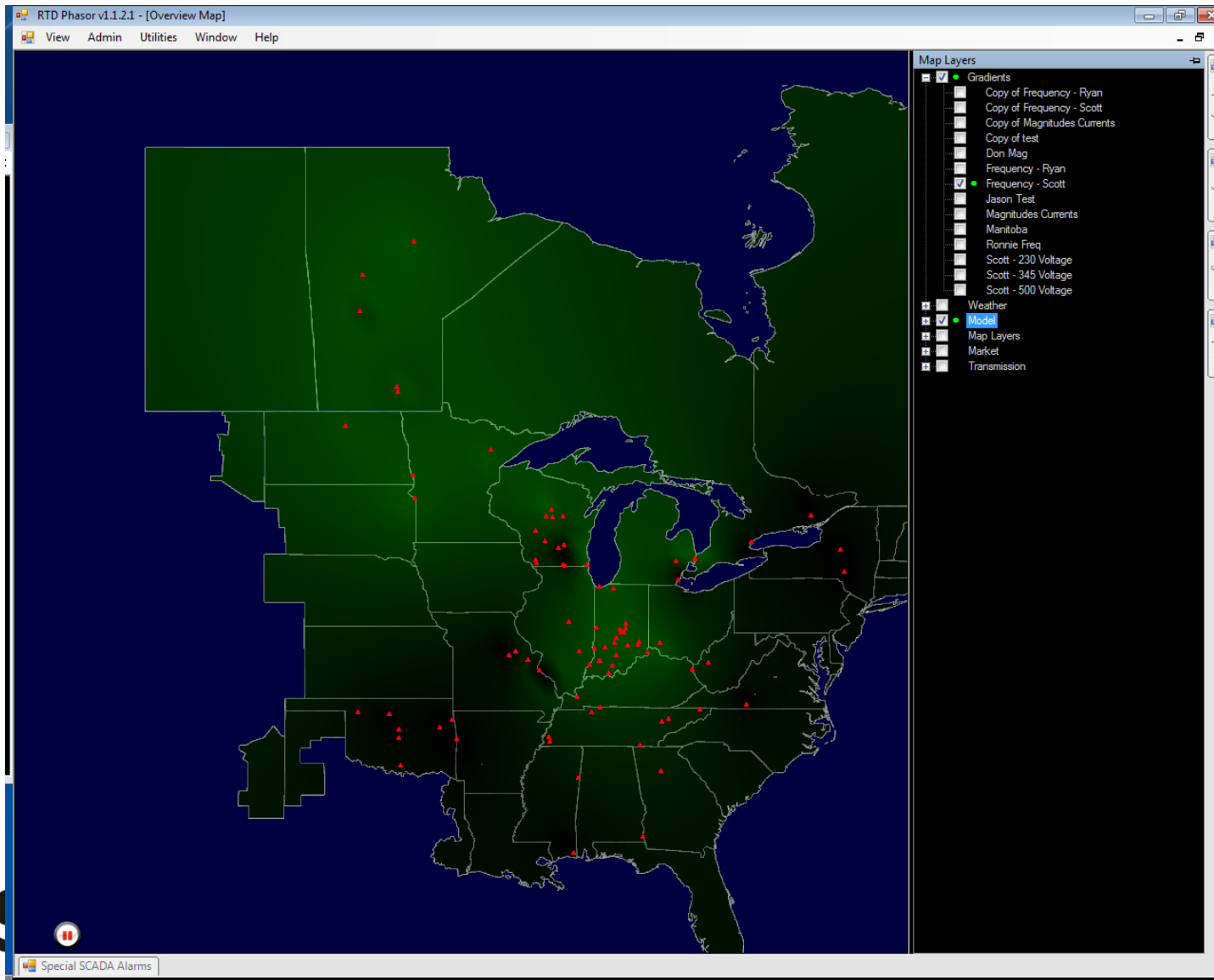
- **MISO is preparing to enter parallel operations with our data management and visualization solution based on OpenPDC at the end of the year.**
- **Currently sourcing data from EMS, Oracle, PI, weather bug with plans to add TSAT, VSAT, National Weather service and web service interfaces.**
- **We like a lot of data – currently over over 400,000 measurements on our way to 700,000**
- **Storing data to Oracle via output adapter. Plan for 180k values with their associated quality codes a second 680M values an hour (close to 1.3B per hour if you could quality code separate from the data)**

# eRTD

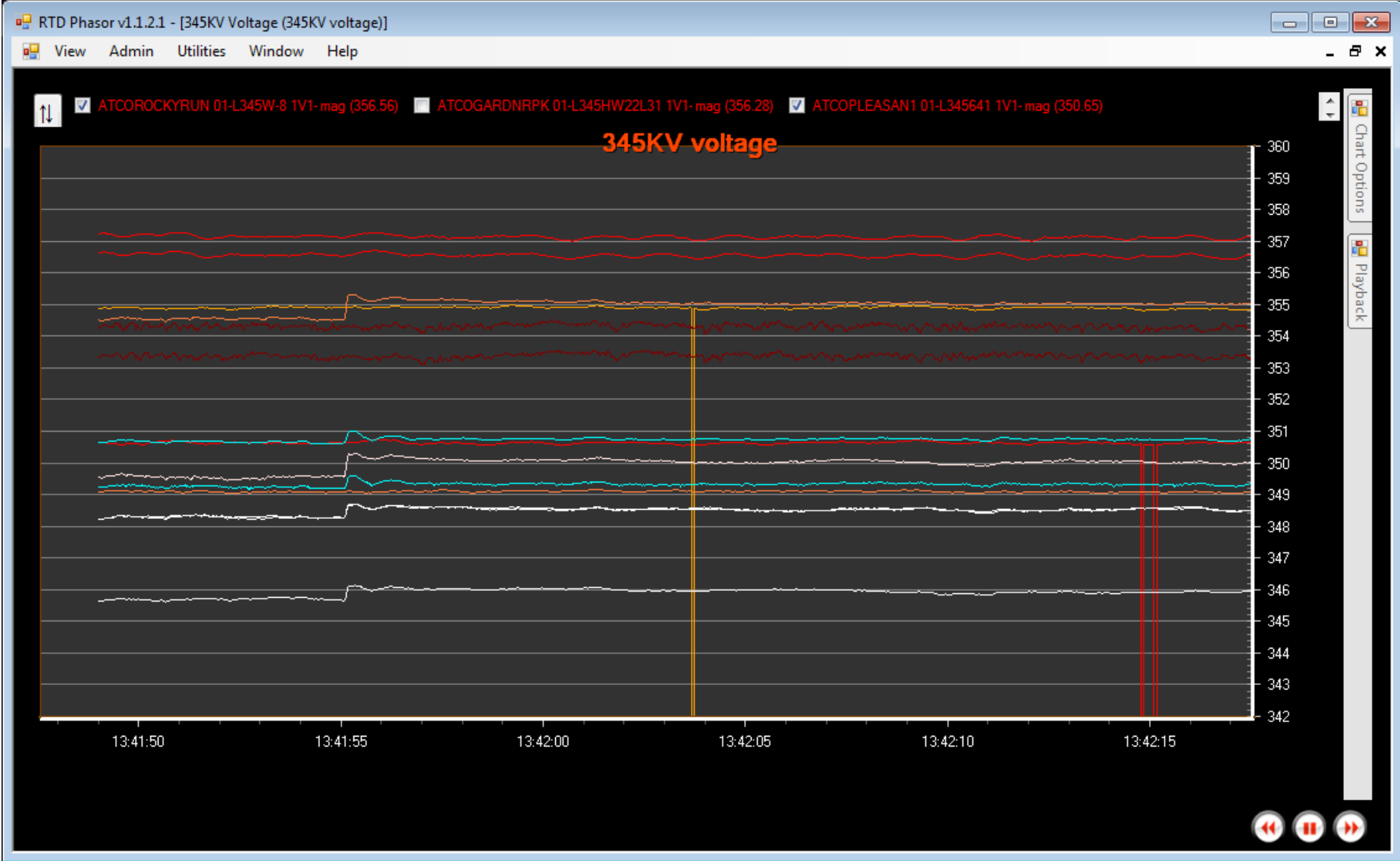




# Map – right Dock open



# Trend – Playback mode





# Calculated Point Definition

RTD Phasor v1.1.2.1

View Admin Utilities Window Help

Calc Points

Name	Description	Station
Calc Point 72312	Calc Point 72312	CAYUGA3
Calc Point test 1	Calc Point test 1	16PRITCH
CALCMODD	Test case	CRFDVL69
Dawns Equation - Addition	Dawns Equation Addition test	Otter Tail Power
<b>Dawns Equation - AVG</b>	<b>Dawns Equation - AVG</b>	<b>Otter Tail Power</b>
Dawns Equation - COS	Dawns Equation - COS	Otter Tail Power
Dawns Equation - Division	Dawns Equation - Division	Otter Tail Power
Dawns Equation - Max	Dawns Equation - Max	Otter Tail Power
Dawns Equation - Min	Dawns Equation - Min	Otter Tail Power
Dawns Equation - Multiplication	Dawns Equation - Multiplication	Otter Tail Power
Dawns Equation - New Addition	Dawns Equation - New Addition	Otter Tail Power
Dawns Equation - SIN	Dawns Equation -SIN	Otter Tail Power
Dawns Equation - SQRT	Dawns Equation - SQRT	Otter Tail Power
Dawns Equation - subtraction	Dawns Equation - subtraction	Otter Tail Power

Disabled Calc Points are greyed out

Remove Add

Calc Point: Dawns Equation - AVG

Name: Dawns Equation - AVG  Enabled

Description: Dawns Equation - AVG

Function: Equation  Use Only If Data Quality Is Good

( ) + - x / Sin() Cos() Sqrt() # Clear

Min() Max() Average() Sum() .

Equation: Average( [CIN CAYUGA3 01-L345EUGENCAYU11B- ang] , [CIN CAYUGA3 01-L345EUGENCAYU11A- ang] )

Points Used

Description	Use Only if Data Quality is Good
CIN CAYUGA3 01-L345EUGENCAYU11B- ang	<input checked="" type="checkbox"/>
CIN CAYUGA3 01-L345EUGENCAYU11A- ang	<input type="checkbox"/>

Add Point... Remove Point

Assign Calc Point to Station: Otter Tail Power Otter Tail Power

Conn. String: framesPerSecond=30;lagTime=3;leadTime=1;

Test Save Close

# Data Quality Monitor

RTD Phasor v1.1.2.1 - [Quality Monitor]

View Admin Utilities Window Help

Selected Circuit

**Circuit Name**      Data Time : ?      [View Details](#)

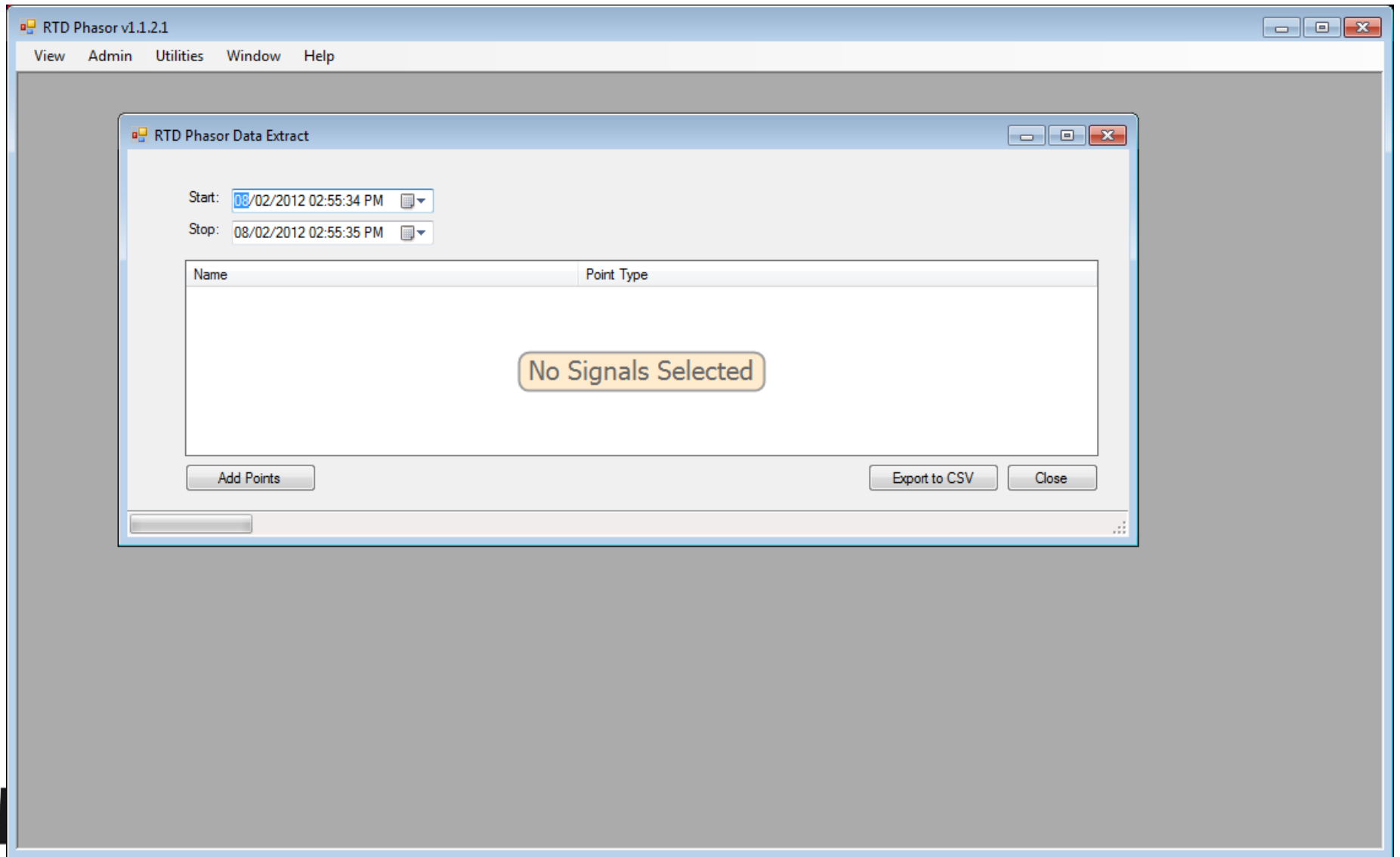
? ?      Device Name      Snapshot Time: ?

? ?      Member Name      Last Heartbeat: ?      [View Graph](#)

H...	St...	Circuit	Device	Member	Data Time	Snapshot Time	Last Heartbeat	
		B 69_91 1	ALTEACADEMY01	Alliant East	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM	8/2/2012 2:48:00 PM	<input checked="" type="radio"/> Active <input type="radio"/> Paused
		247:L345ARPINEAU_1	ALTEARPIN01	Alliant East	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM	8/2/2012 2:48:00 PM	
		B13812 1	ALTEARTESIAN01	Alliant East	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM		
		B 691 1	ALTECOLLEYRO01	Alliant East	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM	8/2/2012 2:48:00 PM	
		B138_81 1	ALTECOUNCILC01	Alliant East	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM	8/2/2012 2:48:00 PM	
		B 693 1	ALTEDEFOREST01	Alliant East	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM	8/2/2012 2:48:00 PM	
		B 693 1	ALTEHILLMAN01	Alliant East	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM		
		B 692 1	ALTEIOLA01	Alliant East	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM		
		L345IP-4545 1	AMILCLINTON001	Alliant East	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM	8/2/2012 2:48:00 PM	
		241:L345CAL-LSCR-2	AMMOCALLAWAY02	Ameren - Missouri	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM		
		241:L345MTGY-CAL-7	AMMOCALLAWAY02	Ameren - Missouri	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM		
		241:L345MTGY-CAL-8	AMMOCALLAWAY02	Ameren - Missouri	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM		
		241:L345SUN_1 1	AMMOCALLAWAY02	Ameren - Missouri	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM		
		L345L_GRAY_1	AMMOLABADIE01	Ameren - Missouri	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM		
		L345L_GRAY_2	AMMOLABADIE02	Ameren - Missouri	8/2/2012 2:48:00 PM	8/2/2012 2:54:08 PM		

Database Time (EST): 08/02/2012 02:54:15 PM

# Data Extract





# openPDC

- **OpenPDC allow MISO to process Real Time data and playback data in same infrastructure.**
- **Extended a custom developed app for the UI but commercial tools could be used as well (RTDMS, eTerra Vision, STI, ...)**
- **OpenPDC data model extended to manage MISO network model references (Company, Division, Station, Measurement)**
- **Also extended data model to keep configuration of UI elements and data quality adapters.**

# Sorry we could not be there in person :(

- **Any follow-up question please contact**
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  - Scott Stapels [sstapels@utilicast.com](mailto:sstapels@utilicast.com)