

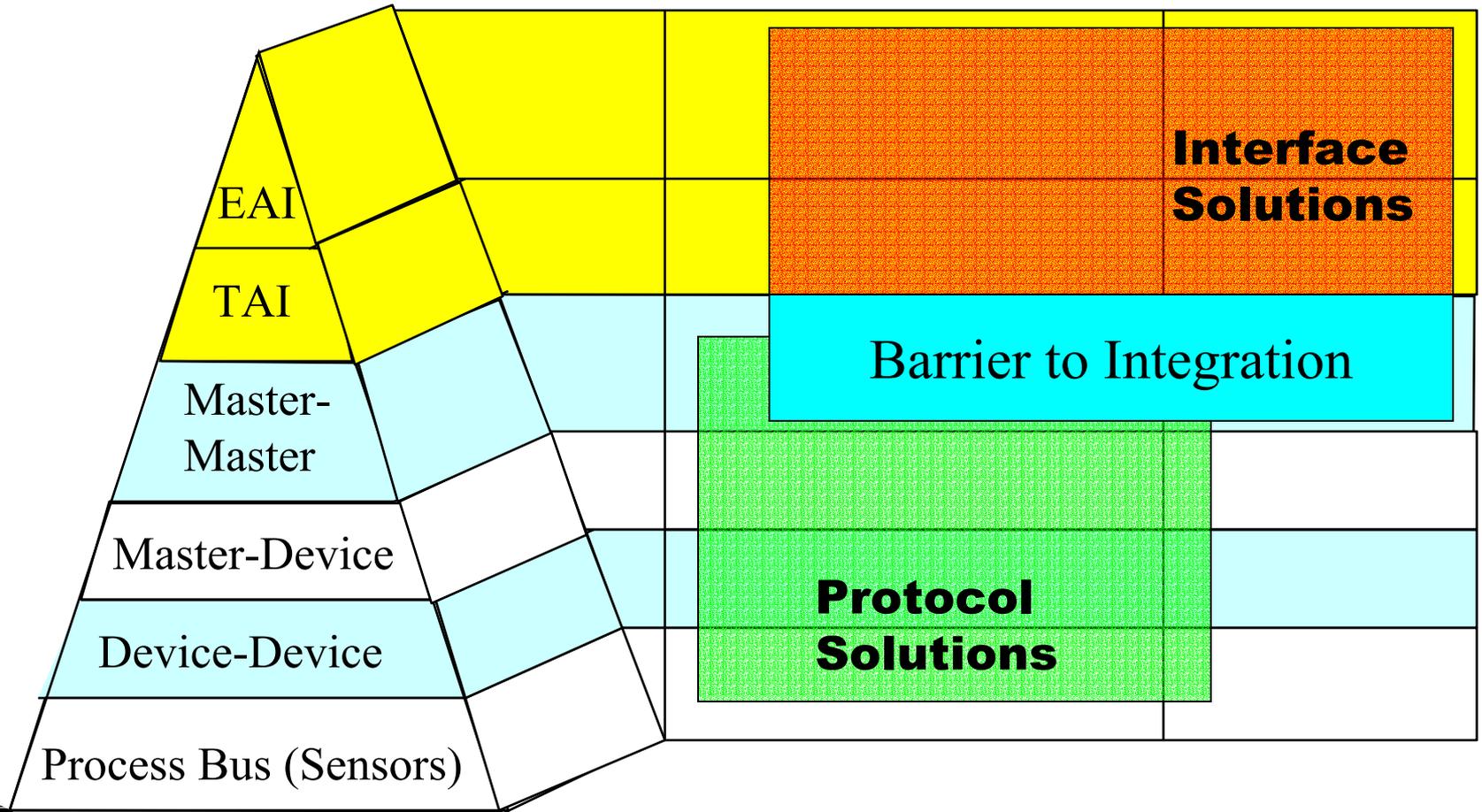
# IECSA and Phasors

An Architectural Solution that Provides  
Scalability and Technological Investment  
Protection

Presented by: Herbert Falk – SISCO



# SISCO ::= Systems Integration Specialists Company, Inc.



# Overview

- What is IECSA
- The problems found?
- The need for standardized interfaces
- SISCO GAP an IECSA oriented solution



# IECSA is part of CEIDS



Consortium for Electric Infrastructure  
to Support a Digital Society

Contact Us Site Map



Electricity Innovation Institute

CEIDS Home

About CEIDS

Technical Development

Partners

Information

Declared as the greatest engineering achievement of the 20th century by the U.S. National Academy of Engineering, the vast networks of electrification have been the direct catalyst of today's exponential growth in economic productivity. In a single century, electricity has become the foundation and prime mover of our modern society. It has opened the doors of invention to new technology and application of incredible precision, intelligence, and communication. It is imperative that the electric infrastructure continued to meet the demands of an increasingly digital society, well into the unforeseen future.

This is the charter of CEIDS - to transform the current infrastructure into a new electric delivery system that integrates advanced and elec of the dig



Developing the science and technology that will ensure an adequate supply of high-quality, reliable electricity to meet the energy needs of the digital society

Information: <http://www.e2i.org/e2i/ceids/index.html>



# What is IECSA

## Integrated Energy and Communications System Architecture

The Integrated Energy and Communications Systems Architecture (IECSA), is a roadmap to a next generation power system consisting of automated transmission and distribution systems that support efficient and reliable supply and delivery of power.

The goal is to create a "self healing" power system capable of handling emergency and disaster situations while able to accommodate current and future utility business environments, market requirements, and customer needs.

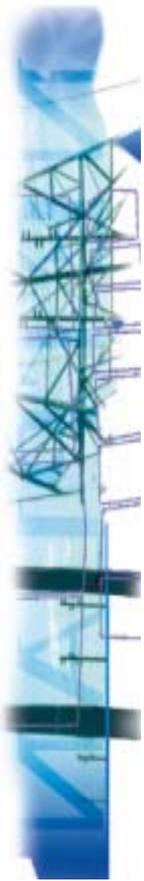
IECSA is an open, standards-based set of blueprints for integrating power and communications systems to improve the reliability, quality, and security of our electricity.

Information: <http://www.iecsa.org/>

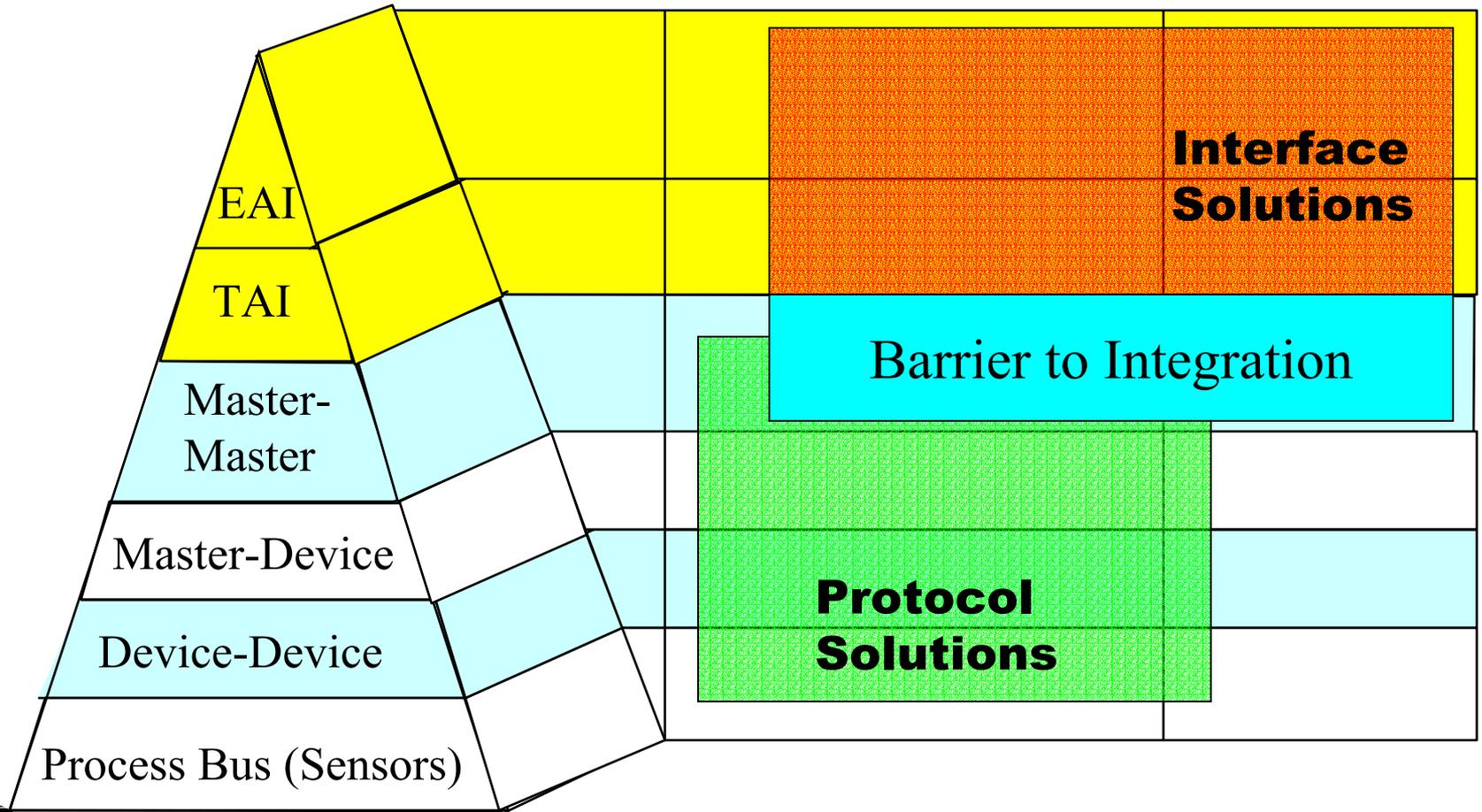


# Looking at the Phasor Problem from an Architectural Perspective

- There are issues in selecting a “protocol” only based solution.
- There are issues in regards to retrieving information by applications.
- There are some issues with measurement synchronization.



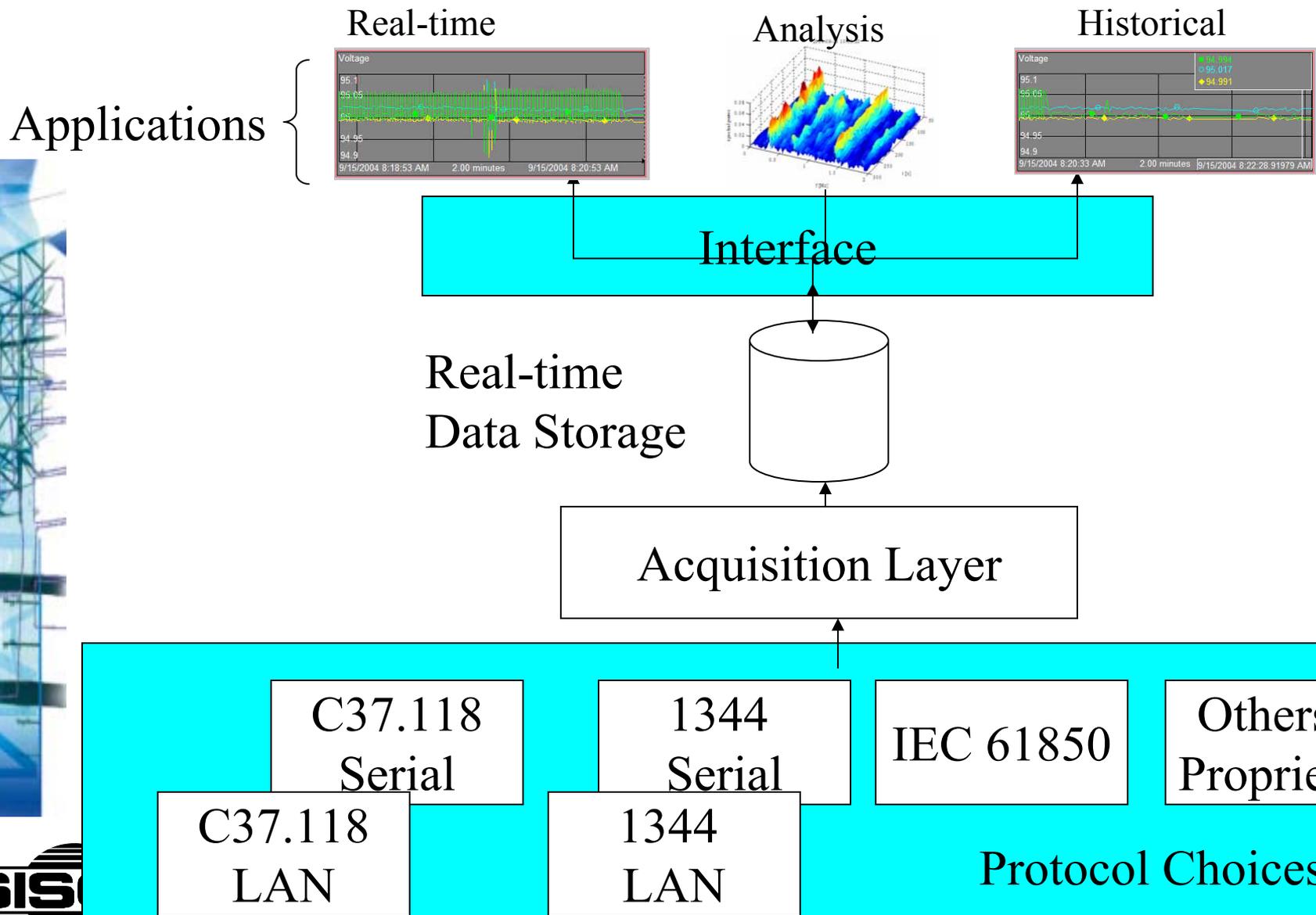
# The problem with protocols



# Many protocols can:

- Be used to convey phasors
  - IEEE C37.118 (serial and LAN?)
  - IEEE 1344 (serial and LAN versions)
  - IEC 61850
  - In the future others may be developed.
- All of the above protocols deal with real-time delivery.
- For Applications this means.....

# Application Architecture given protocol only approach....



# There are:

- Multiple protocols in existence that can deliver the accuracy of phasor data required.
- More will be evolving.
- Need to protect the development invested in analytical applications.

Conclusion: Applications need to be protocol agnostic.



# Application Interfaces needs to provide:

- Access to Real-time data.
- Access to historical information for post-analysis

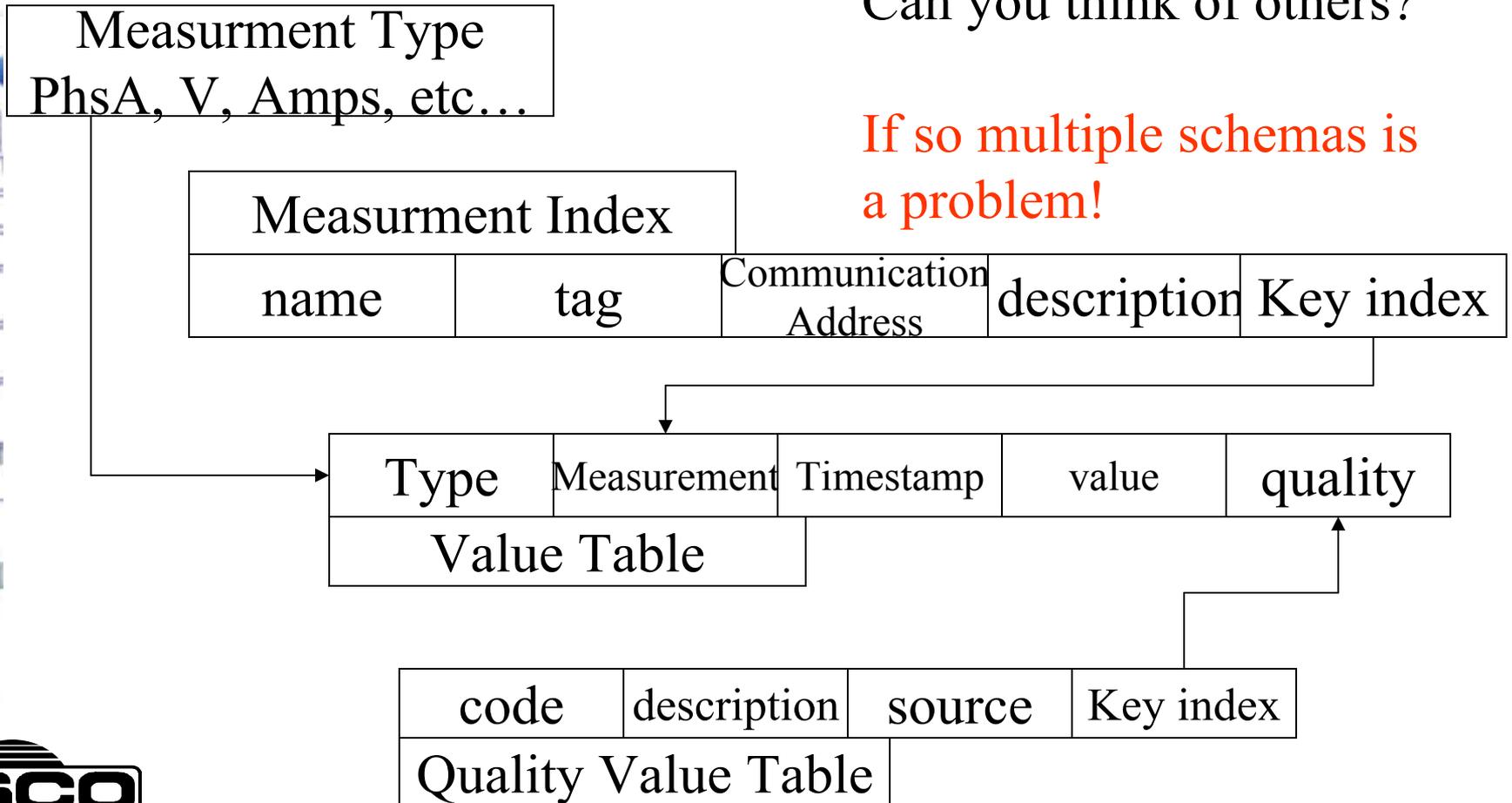
One would assume that a RDBMS solution would work?



# What is the schema of the tables?

Can you think of others?

If so multiple schemas is a problem!



# IEC61850 standardizes interfaces

- Interfaces need to abstract away the back-end structure of the database.
- Provide the ability to reference against the power system model (e.g. CIM) and not just tags.

# IECSA interfaces relevant to phases

IEC Name

OPC Foundation Name

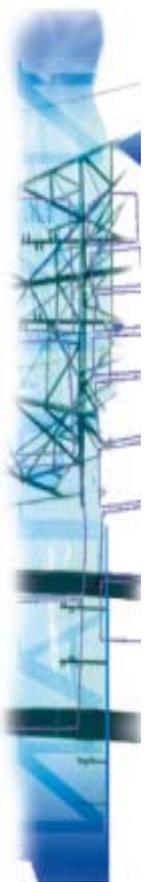
HSDA

OPC DA

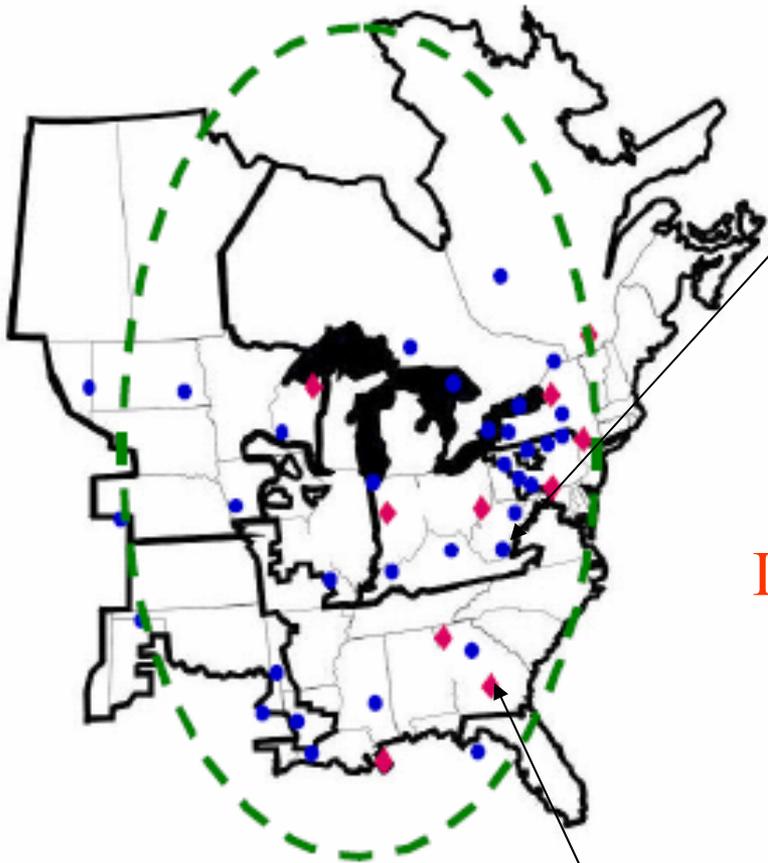
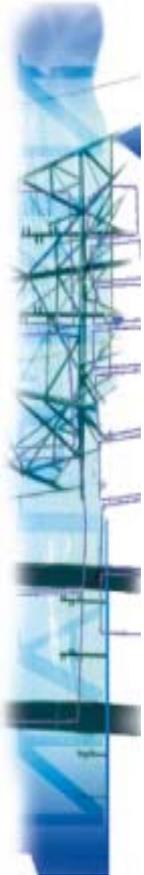
TSDA

OPC HDA

Allows mappings to Corba, COM (OPC), SOAP, others....



# Another issue -Disparate samples



20 times a second

30 times a second

Time	20/sec	30/sec
x.033		m
x.05	n	?

Interpolation is needed.

ServerSide or Application based?

Consistent analysis indicates server side interpolation.



# Interpolation is the key

Example:

Time	20/sec	30/sec
x.0	n	m
x.033		m+1
x.05	n+1	?
x.066		m+2
x.10	n+2	

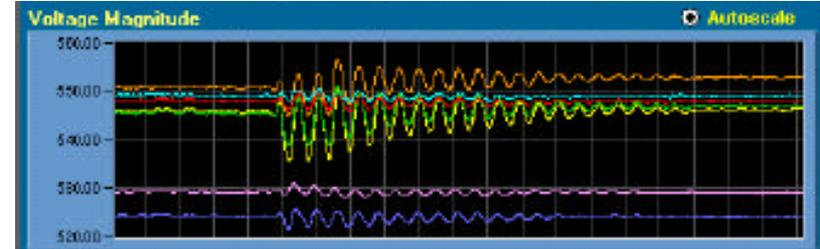


Application requests both values at x.05

What value should be returned for 30/sec value?

# Possible Value Returned

- No Value
- Value from x.033
- Value from x.066
- A interpolated value



Most graphical systems already interpolate.

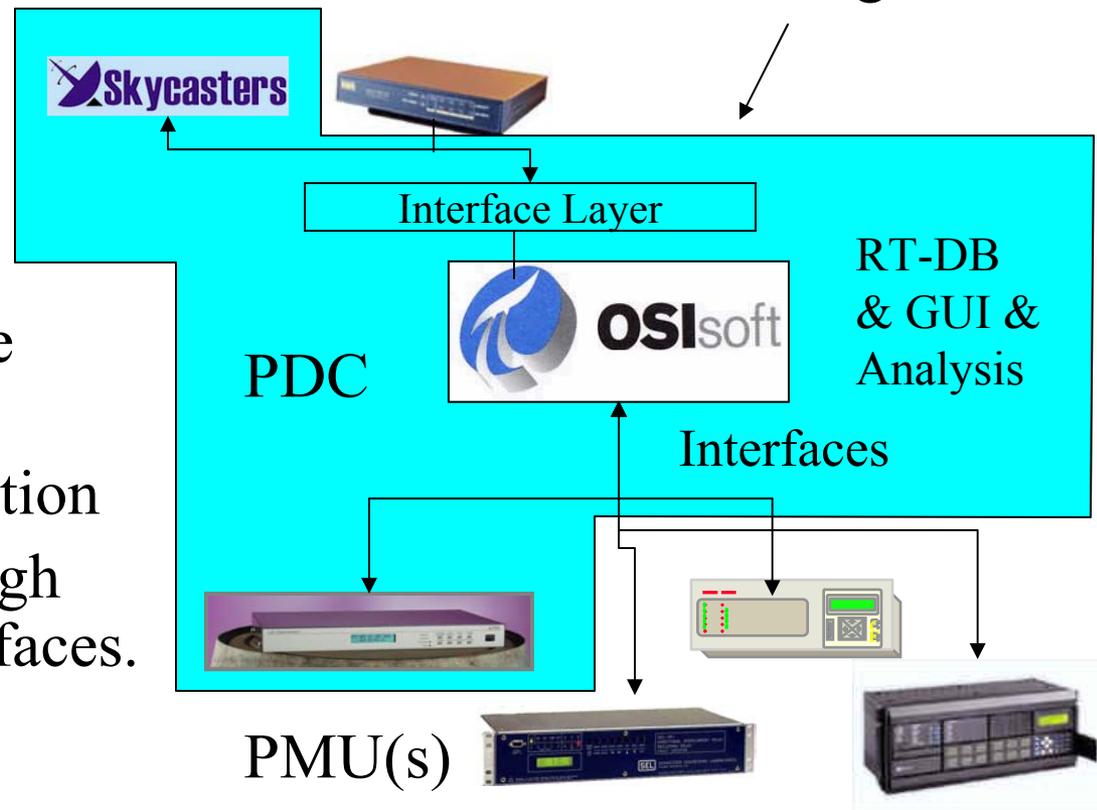
Interpolation should be Storage Interface service.  
Applications could augment.

# SISCO Grid Analysis Package (an IECSA capable solution)

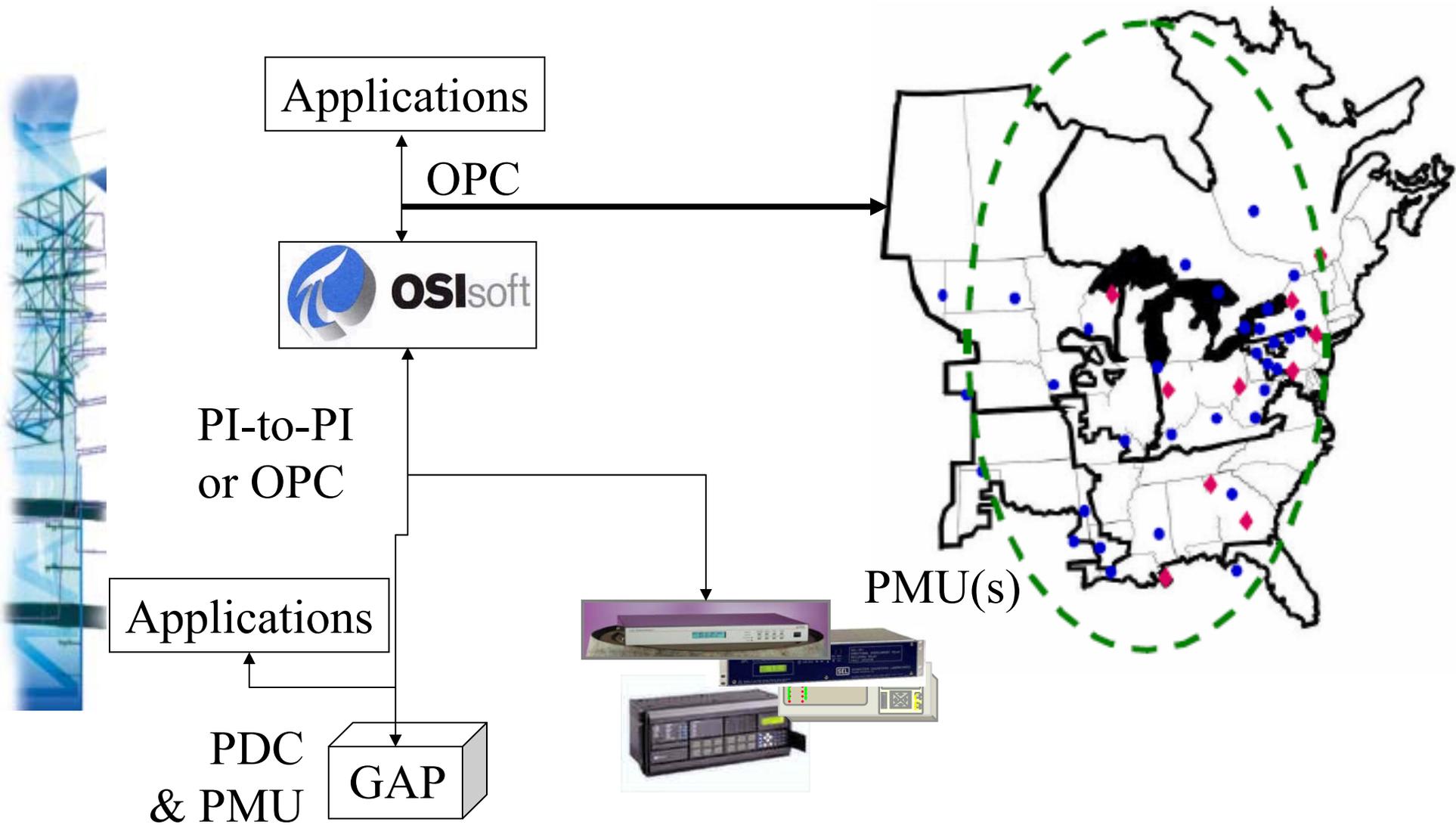
## • Requirements

- Scalability
- Distributed function/analysis capability.
- Allow for multiple protocols.
- Provide data retention
- Expose data through standardized interfaces.

One possible configuration



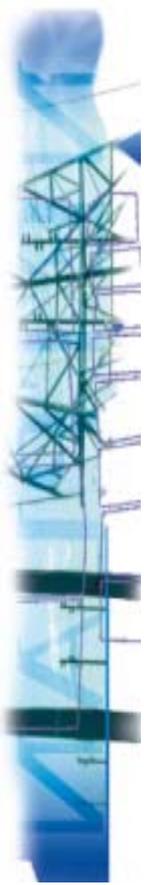
# Multiple Ways to distribute/interface



# GAP and IECSA solution provides

- Server side interpolation
- Inherent ability to support multiple protocols.
- Provides IECSA compliant interfaces.
- Provides 5 day buffering of phasor information.
- Allows acquisition of other information besides phasors.
- Provides localized GUI/Analysis capability.
- Provides remote management capability.
- Provides bi-directional communication paths.





Stop by to discuss and see the  
architecture working

Find out what else can be done...



# For More Information Contact:



Herbert Falk  
herb@sisconet.com  
586-254-0020 x105

Ralph Mackiewicz  
ralph@sisconet.com  
586-254-0020 x103

<http://www.sisconet.com>



Larry Kuhl  
Lkuhl@osisoft.com  
315- 233-9283

Chuck Wells  
cwells@osisoft.com  
510-297-5802

<http://www.osisoft.com>

