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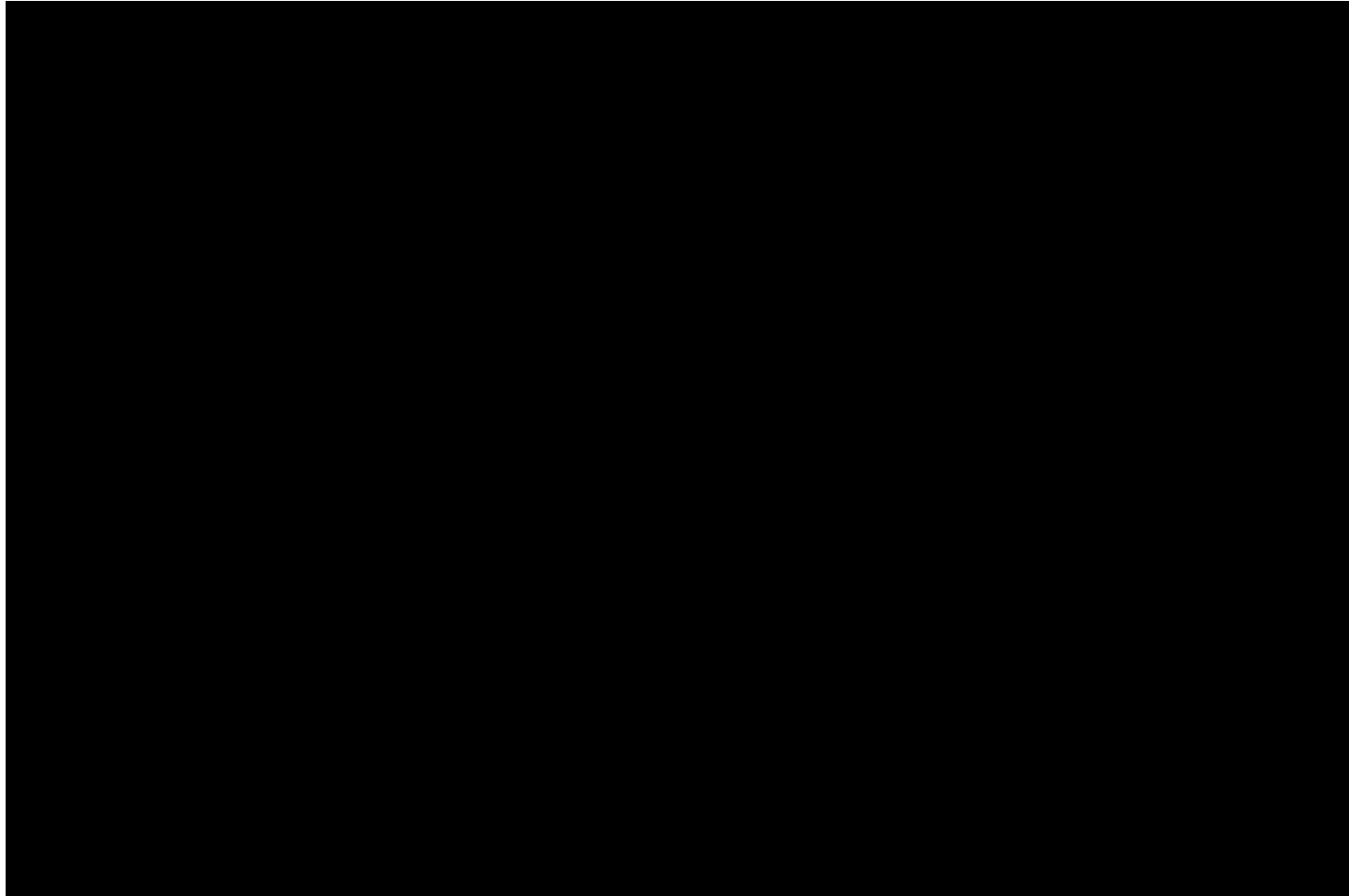
GESTIÓN INTELIGENTE
PARA UN MUNDO MEJOR



Synchrophasors in the Colombian Power System

Luis Alejandro Camargo Suan

Synchrophasor Technology

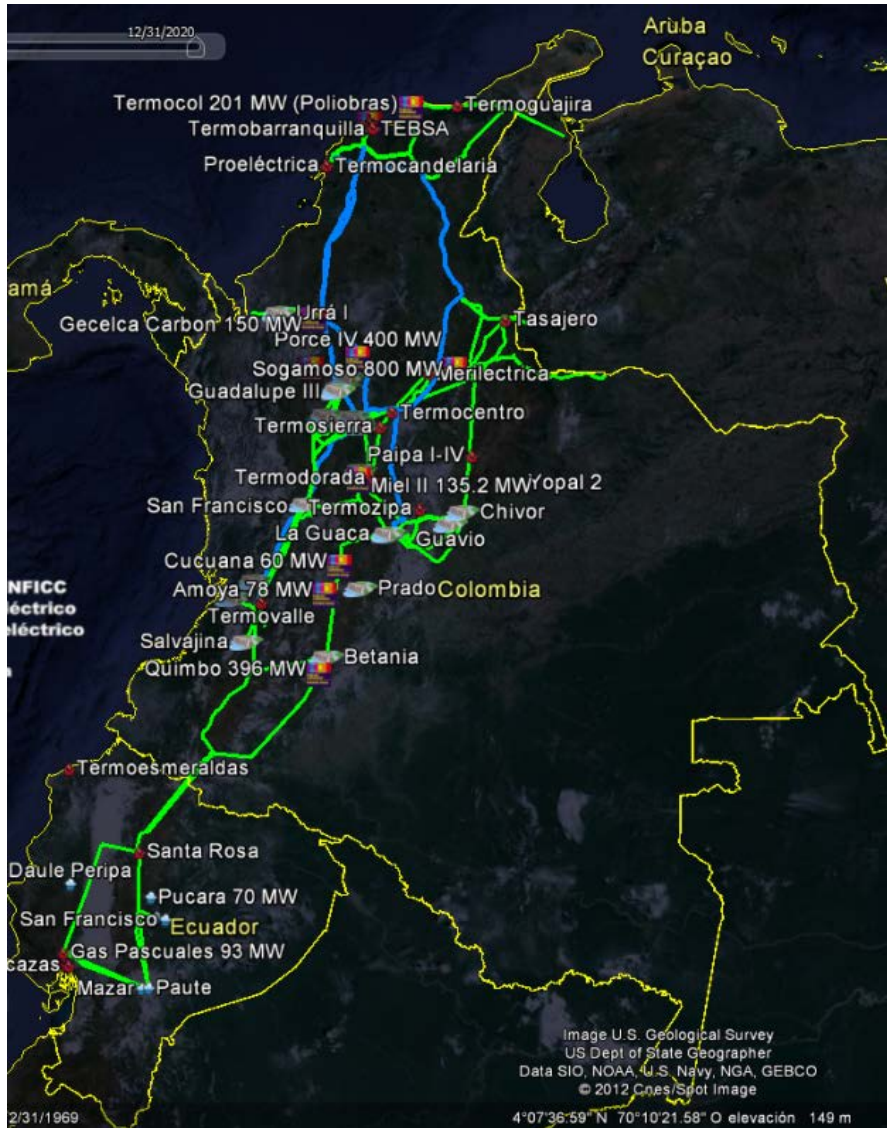


Content

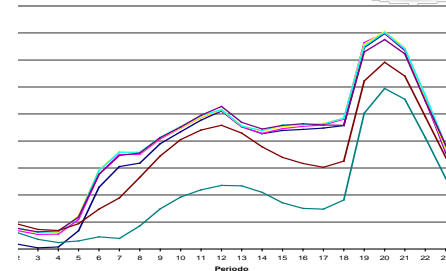
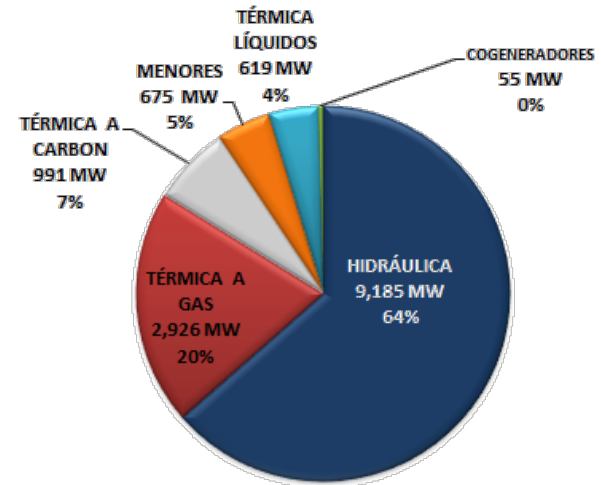
1. Basic data of the Colombian Power System
2. Historical Development
3. Current WAMS Implementation in Colombia
4. WAMS Information at the Control Center
5. iSAAC Project



Basic data of the Colombian Power System



CAPACIDAD DE GENERACIÓN



Peak load
9.5 GW

TRANSMISSION NETWORK

VOLTAGE LEVELS	LENGTH (km)
110-115 kV	10,137
220-230 kV	11,830
500 kV	2,437
TOTAL	24,404



Historical Development

Blackout 2007
Lessons Learned

Sirena Project
(2007 – 2012)

WAMS
Implementation
(2009-2013)



Historical Development

Blackout 2007
Lessons Learned

Sirena Project
(2007 – 2012)

WAMS
Implementation
(2009-2013)

- **Communication protocol to mass media**
- **Training Center**
- **Operator certification**
- **Information for post mortem analysis**
- **Defense Plan against Large Scale Events (SIRENA)**



Historical Development

Blackout 2007
Lessons Learned

Sirena Project
(2007 – 2012)

WAMS
Implementation
(2009-2013)

- **Use of new technology for power system monitoring (PMU)**
- **Telecommunications upgrade**
- **Distributed computing**
- **New methods for simulation and analysis of power systems**
- **WAMPAC system**



Historical Development

Blackout 2007
Lessons Learned

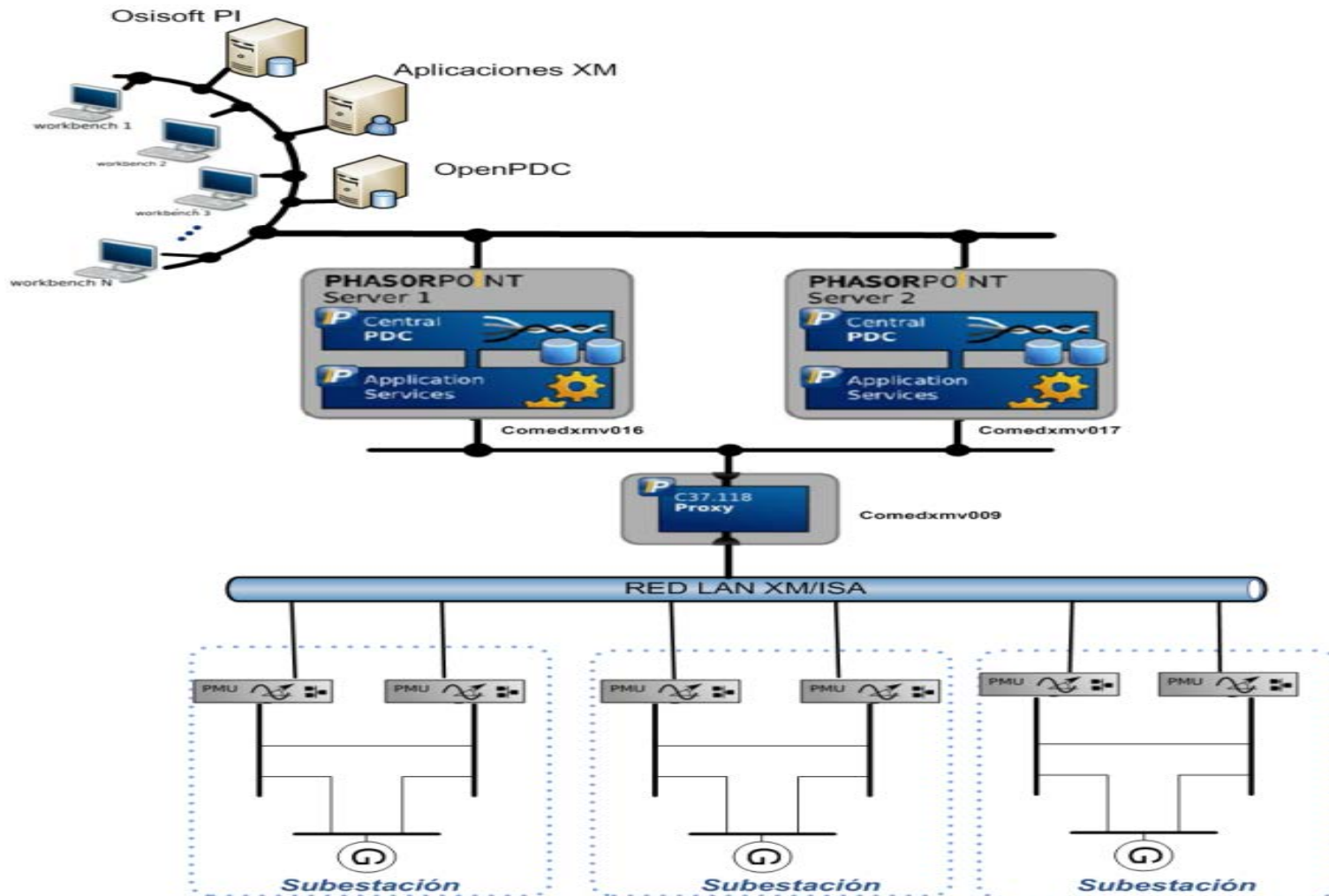
Sirena Project
(2007 – 2012)

WAMS
Implementation
(2009-2013)

- 16 substations with PMUs
- PDC with Phasor Point
- Redundant architecture and high availability
- PI system for historical information
- OPEN PDC and OPEN PG to develop new applications
- 24 new PMUs to be installed in 2013

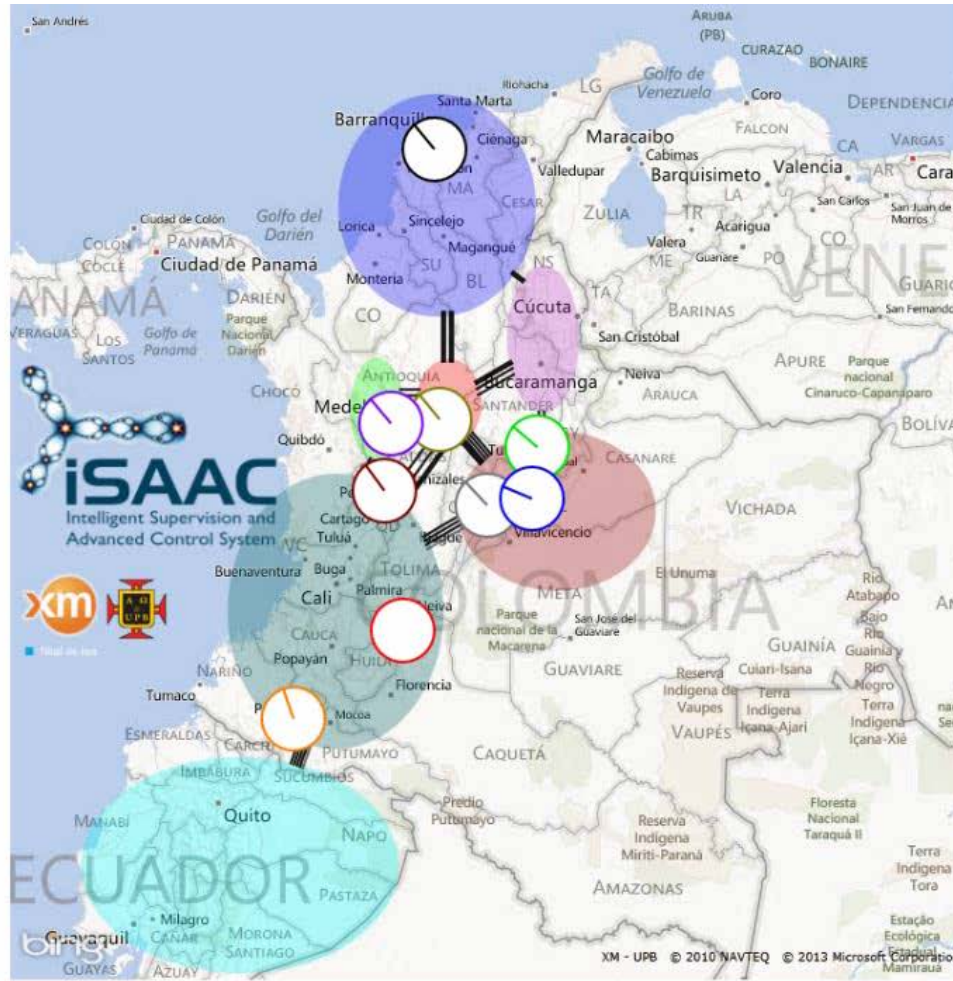


Current WAMS Implementation in Colombia



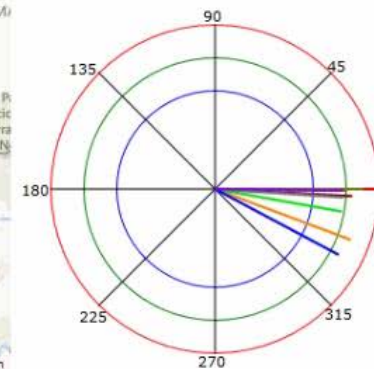
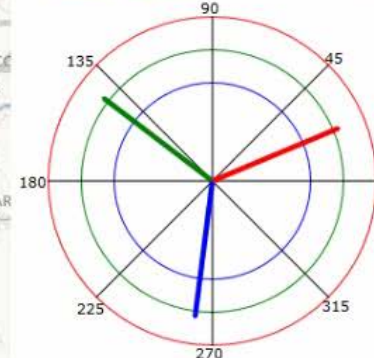
Available Information

<http://172.16.1.250:1815/>



Nivel de tension

- Tension_Betania
- Tension_Esmeralda
- Tension_Sabanalarga
- Tension_Jamondino
- Tension_San_Carlos
- Tension_Sochagota



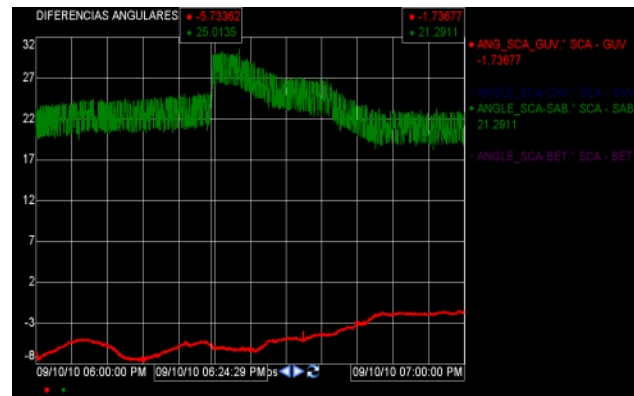
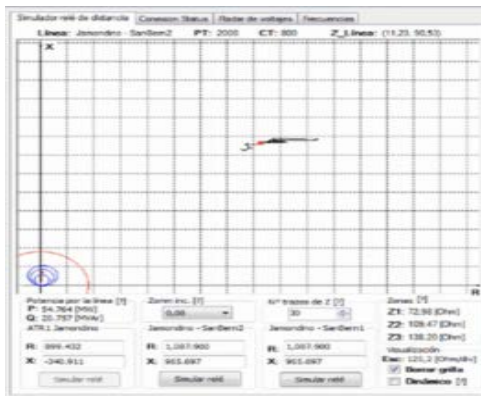
Listo

Intranet local | Modo protegido: desactivado

100%



WAMS Information at the Control Center



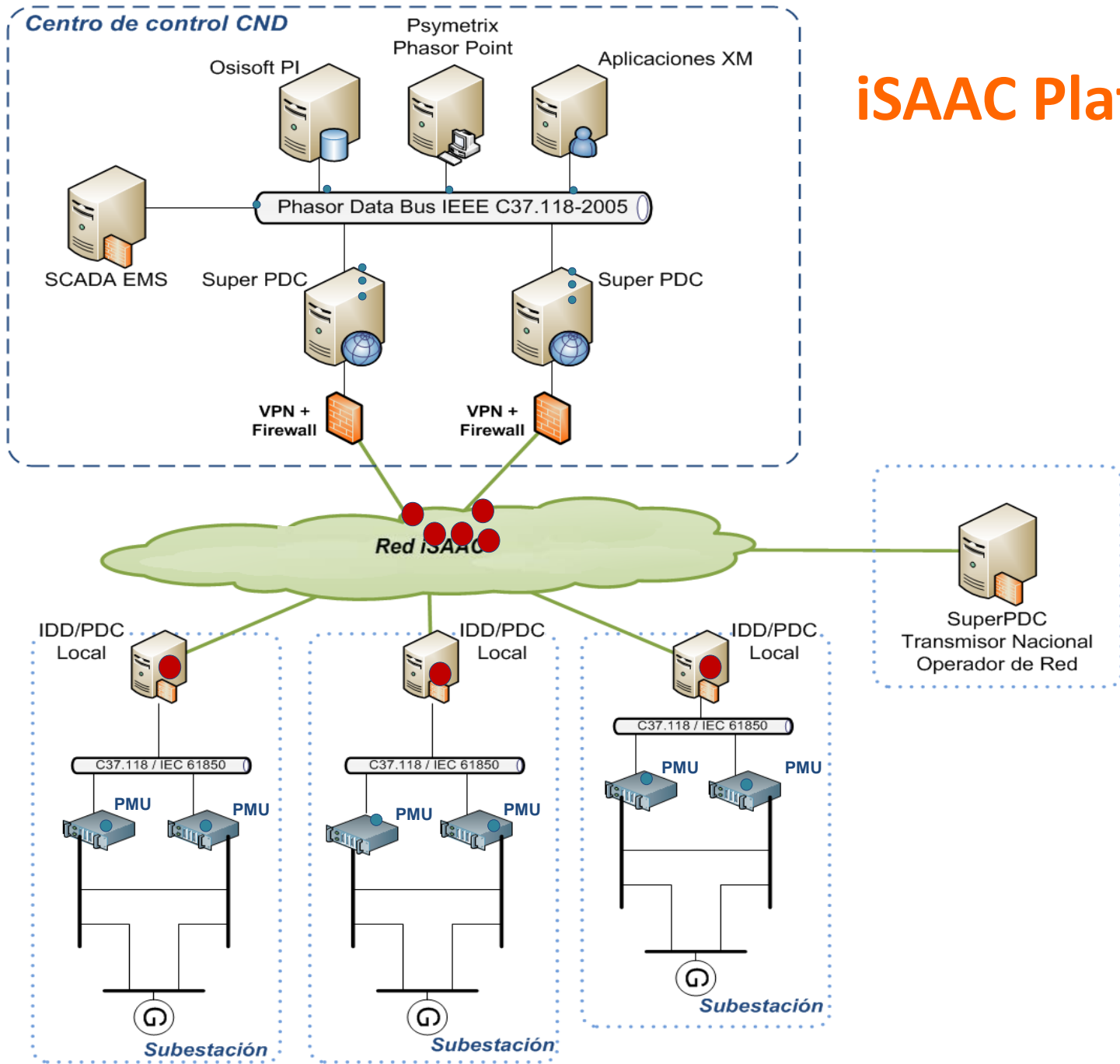
iSAAC Project

The iSAAC project goal is to design and implement the architecture and the functional ecosystem for our future real time supervision and control system, as a natural evolution of the SCADA/EMS, integrating:

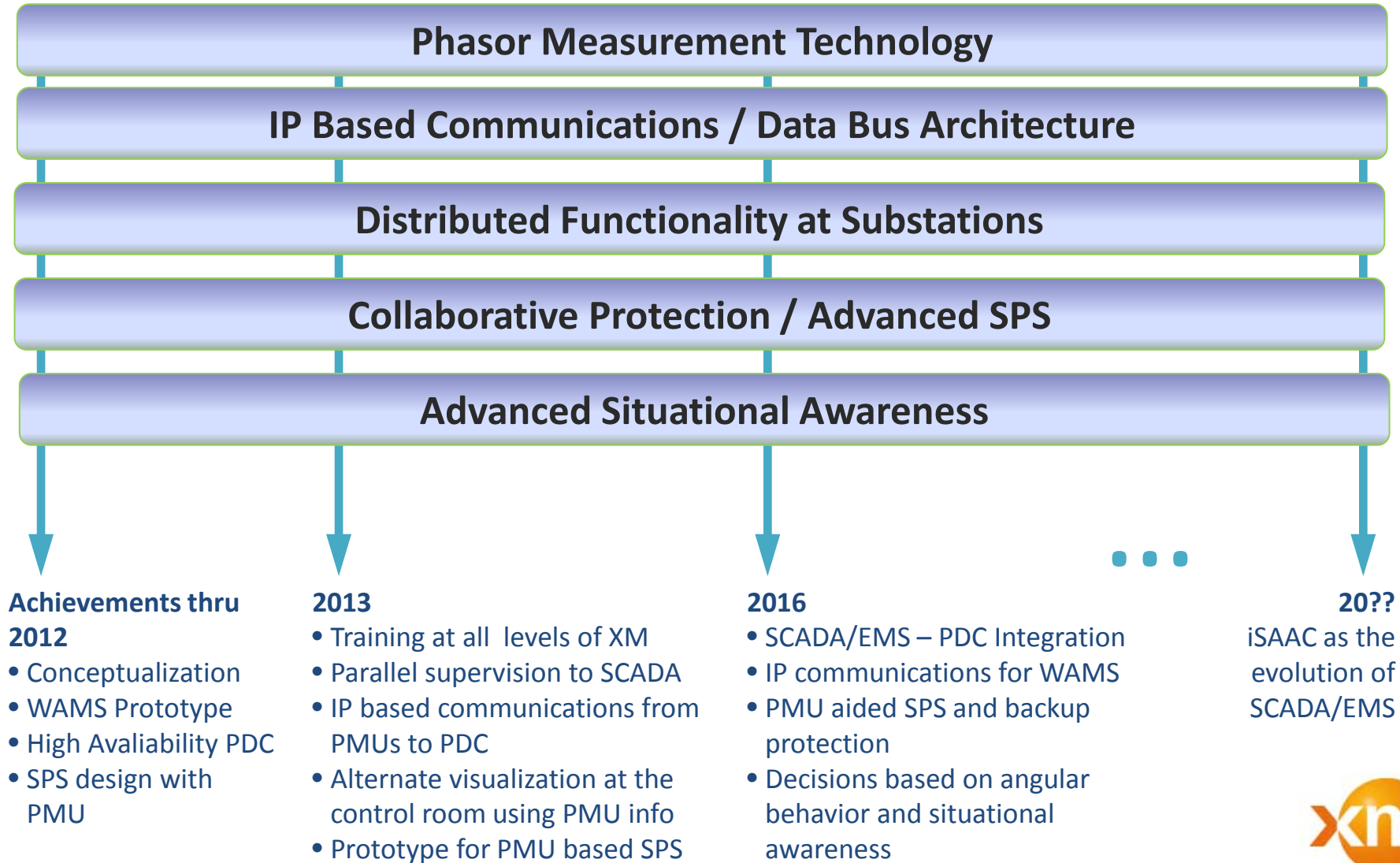
- Phasor measurement technology
- IP based communications / Data Bus architecture
- Distributed functionality at Substations
- Collaborative Protection / Advanced SPS
- Advanced Situational Awareness



iSAAC Platform



Project Development Areas and Key Milestones





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 www.xm.com.co

TODOS LOS DERECHOS RESERVADOS PARA XM S.A. E.S.P.

2012