IEEE1588-Power Conformity Assessment Steering Committee (1588P-CASC)

Chair: Aaron Martin, Bonneville Power Administration

Vice-Chair: Chan Wong, Entergy

TSS Editor: Jeff Laird, Bob Noseworthy, UNH-Interoperability Lab

ICAP: Ravi Subramaniam, IEEE

Secretary: Ya-Shian Li-Baboud, NIST

IEEE1588-Power Conformity Assessment Steering Committee (1588-CASC) Goals

- Author, Review and Approve IEEE 1588 Power Profile TSS
  - Will continue as a standing committee to update and revise TSS as needed
  - TSS under review: http://nvlpubs.nist.gov/nistpubs/ir/2014/NIST.IR.8002.pdf
- Advise ICAP about viability of a certification program based on the IEEE 1588 Power Profile TSS

IEEE 1588P CASC Charter

- TSS to focus on Conformity Testing
- IEEE C37.238-2016 - Draft requires compliance to IEC/IEEE 61850-9-3, the IEEE 1588 Power Profile TSS will also test for compliance to IEC/ IEEE 61850-9-3.
- Features out of scope of IEEE C37.238, but thought by the CASC members to be important for the applications, shall also be considered:
  - VLAN
  - Interoperability

Understanding Conformity Assessment

- What is Conformity Assessment?
  - Conformity Assessment is defined as the process or processes that are used to demonstrate that a product or service meets specified requirements (set forth in Standards, Test Plans, etc.)
- Conformity Assessment
  - Provides assurance and confidence a product or service meets requirements
  - Empowers the user to make better purchasing decisions
  - Benefits the supplier as products may gain market acceptance
- Conformity Assessment Activities Include:
  - Conformance, Interoperability, Inspection, Accreditation
  - "Catch-all" term to address range of test-related activities

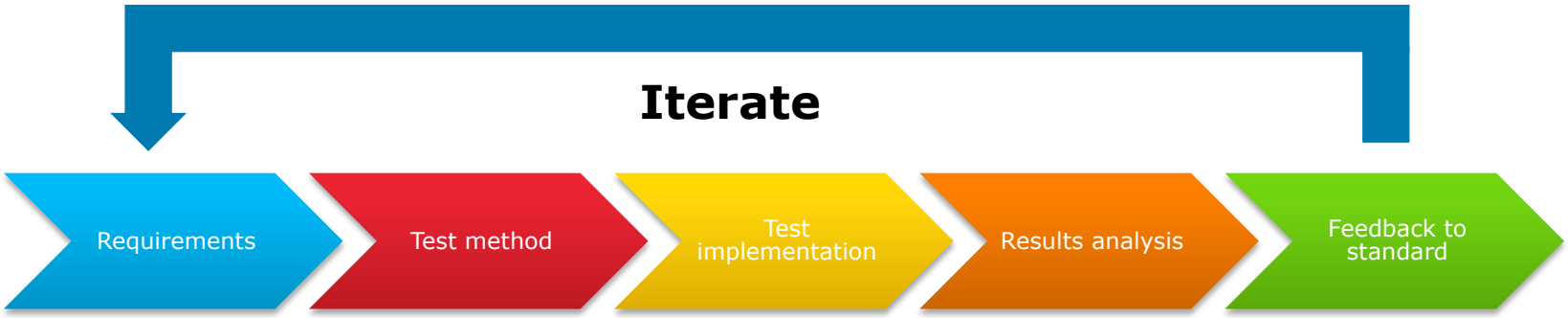
IEEE Synchrophasor Certification Program

- IEEE Synchrophasor Measurement Test Suite Specification (TSS) available now
  - Developed by IEEE Synchrophasor Conformity Assessment Steering Committee (SCASC)
  - Unambiguous, systematic way of testing PMUs according to IEEE C37.118.1a-2014
  - TSS format according to IPRM recommendatio
- Certification Program – operational
  - Testing performed at IEEE authorized test Lab
  - Vendors can apply for certification
  - Certified PMUs are now available

IEEE C37.238/IEEE 1588 Power Profile

- NIST and UNH-IOL joint support
- **Objective:** To support current standards development efforts in IEEE 1588 & PSRC WG so that Level 1 and Level 2 requirements are clear and observable by:
  - Developing test metrics and methods
  - Prototype conformance test software
- **Work duration:** 12 months
- **Outputs:**
  - Conformance test plan for IEC 61850-9-3 Levels 1 and 2
  - Prototype conformance test software
  - Interoperability tests to ensure Power Profile devices from different manufacturers are interoperable and maintain optimal performance
- **Future:**
  - Explore security testing to ensure time synchronization of Power Profile devices can maintain robustness and resilience to anomalous scenarios while maintaining sufficient performance capability.

Test Plan Development Process

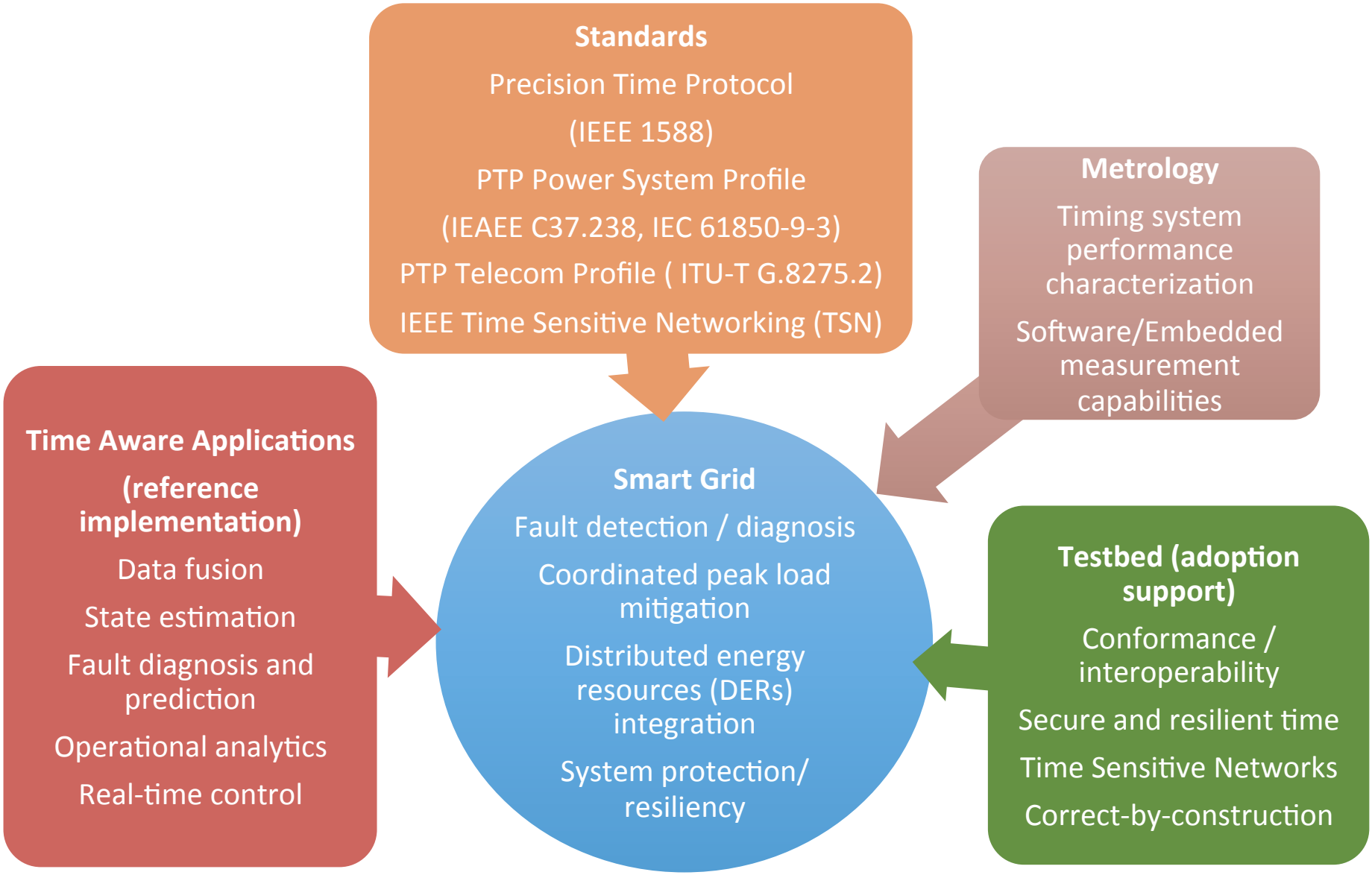


Timeline of Related Activities

- IEEE/IEC PTP Power Profile Level 1 approved May 2016
- IEEE C37.238 Power Profile (Level 2) ballot May 2016
- IEEE 1588 Precision Time Protocol Update – 2017

- TSS complete draft to be available in January 2017

NIST Timing Project Objectives



NIST Smart Grid Testbed (Cyber) Objectives

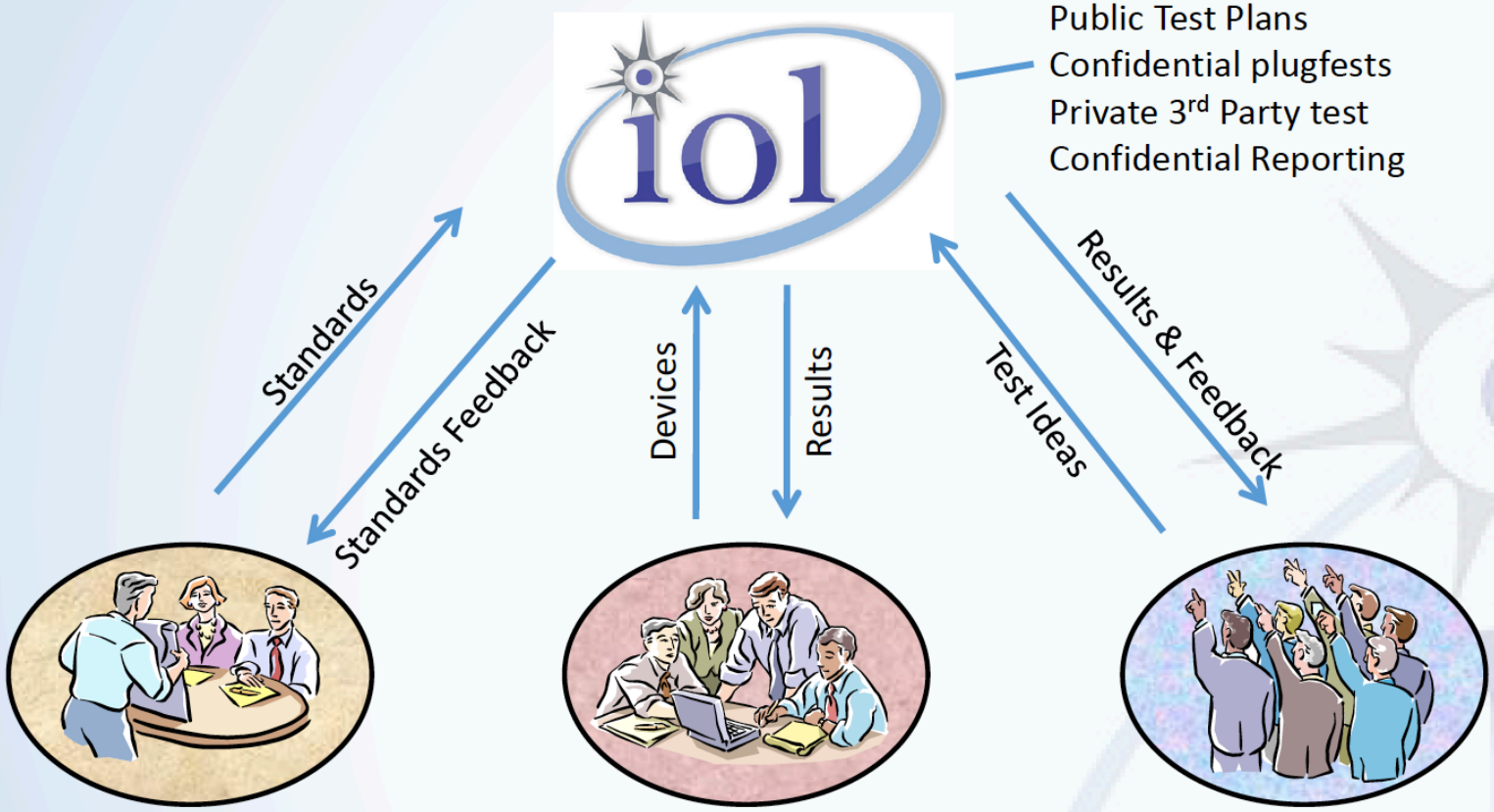
Timing standards, metrology, and assurance for distributed measurement and control.

Evaluating algorithms for power system measurement and control optimization.

Timely and reliable communications.

Cybersecurity for data flows and devices.

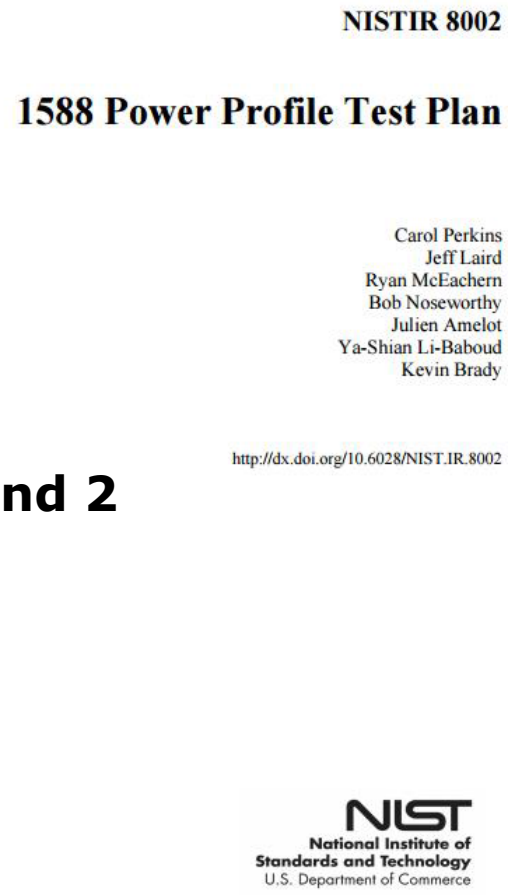
UNH-IOL Industry Engagement



UNH/IOL TSS Development

NISTIR 8002: IEEE C37.238

- PTP attributes
- Best master clock algorithm
- Path delay mechanism
- Timescale
- TLVs
- Timescale


NISTIR 8002

1588 Power Profile Test Plan

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http://dx.doi.org/10.6028/NIST.IR.8002

NIST
National Institute of Standards and Technology
U.S. Department of Commerce

Update: IEEE/IEC 61850-9-3 Level 1 and 2

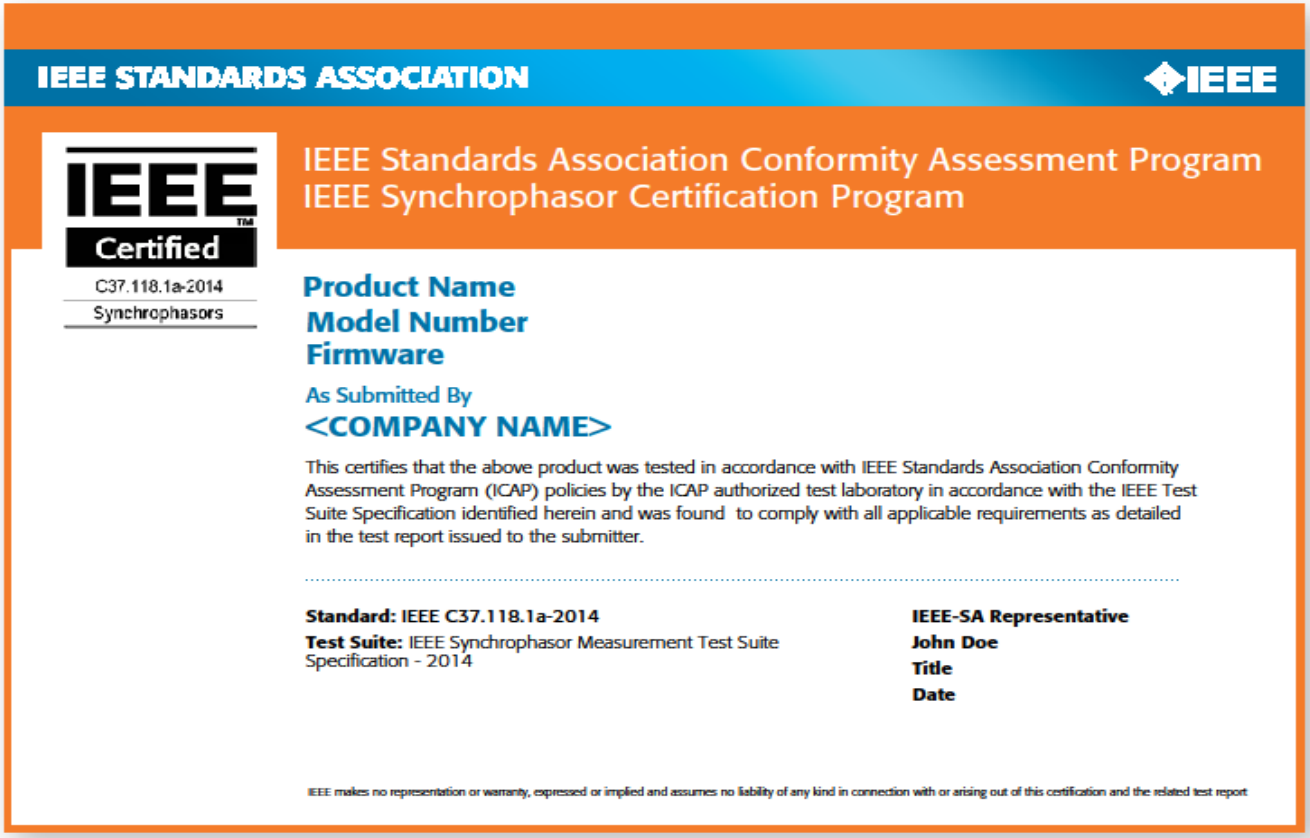
- PTP attributes
- Time inaccuracy
- TLVs
- VLAN
- Interoperability exploration
- Redundancy

Benefits of Implementing a Conformity Assessment Program

- Benefits of conformance test before deployment implementation
  - Early identification of non-conformances
  - Exact functionality of the protocol is identified
  - Multi-vendor solutions will have interoperability issues – helps identify such issues
  - New offerings will have bugs – helps to catch them
- Reduces the vendor's cost/need for re-tests for different end-users
- Establishes a baseline for performance expectation
  - Eases interoperability
- Transparency based on common implementation/Test Authority

IEEE Certificate

- Upon completing all interoperability or compliance requirements, applicants receive a certificate and are listed on an IEEE registry



IEEE STANDARDS ASSOCIATION

IEEE Certified
C37.118.1a-2014
Synchrophasors

IEEE Standards Association Conformity Assessment Program
IEEE Synchrophasor Certification Program

Product Name
Model Number
Firmware

As Submitted By
<COMPANY NAME>

This certifies that the above product was tested in accordance with IEEE Standards Association Conformity Assessment Program (ICAP) policies by the ICAP authorized test laboratory in accordance with the IEEE Test Suite Specification identified herein and was found to comply with all applicable requirements as detailed in the test report issued to the submitter.

Standard: IEEE C37.118.1a-2014
Test Suite: IEEE Synchrophasor Measurement Test Suite Specification - 2014

IEEE-SA Representative
John Doe
Title
Date

IEEE makes no representation or warranty, expressed or implied and assumes no liability of any kind in connection with or arising out of this certification and the related test report

Upcoming Plug-Fests

- IEEE Symposium on Precision Clock Synchronization (ISPCS) September 4-6, 2016 Stockholm, Sweden
  - 2016 Register at: http://www.ispcs.org/2016
  - 2015's event saw >76 attendees, ~50% with Power interests
- IEEE PES JTC, January 2017
- UCA IOP, October 2017, New Orleans, LA

Jeff Laird (Technical Lead) – ISPCS Plug-Fest Co-Chair, IEEE 1588 Upkeep Committee Secretary

Conclusion

- Conformity impacts interoperability and performance
- Certification is necessary to ensure devices are compliant to industry conformity standards
- CASC provides another perspective for standards development – feedback to parallel standards development effort