IEEE P1451.0

An Overview

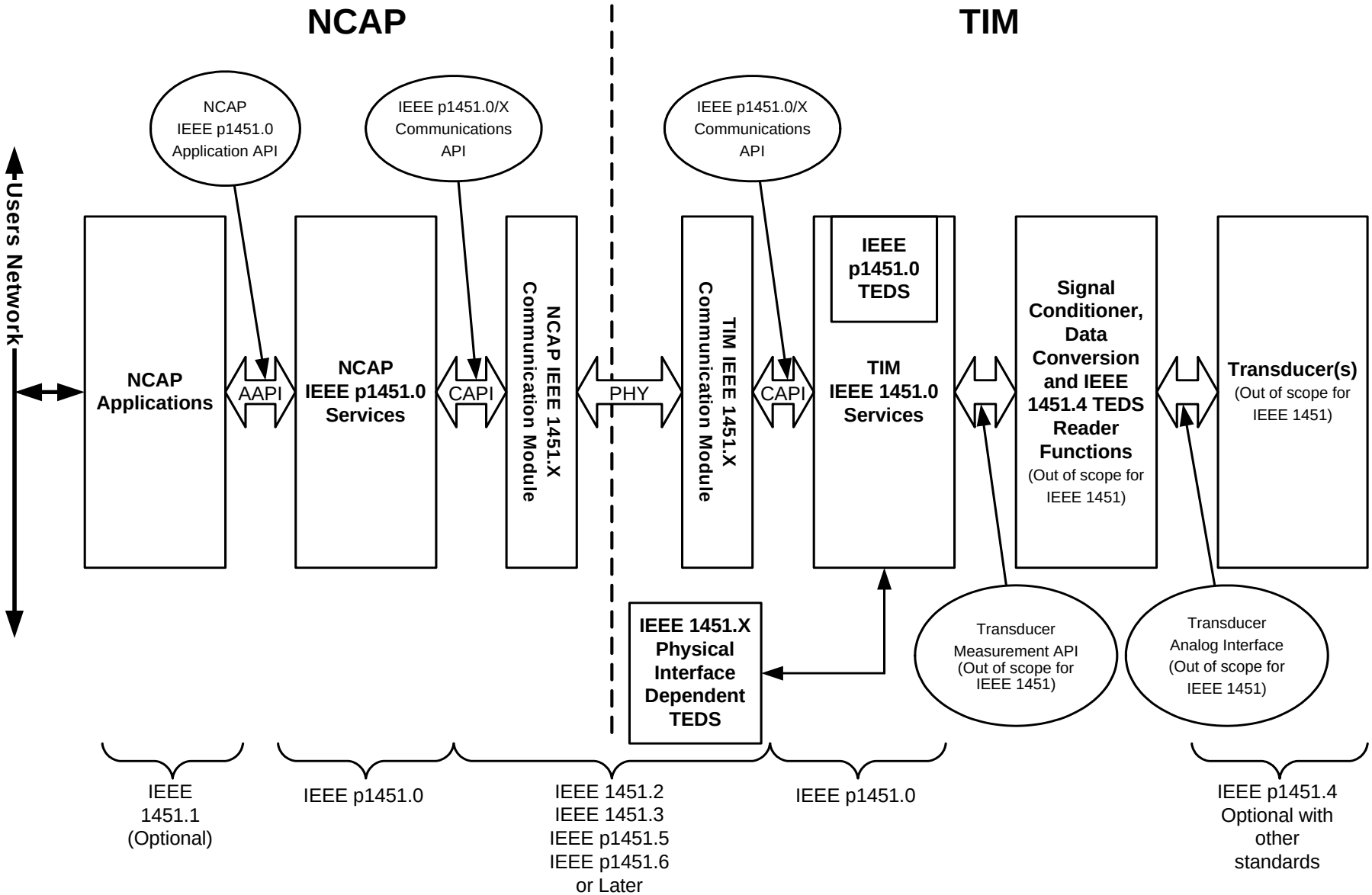
Presented by

Jay Nemeth-Johannes – Complete Test
Jeff Burch - Agilent
Lee Eccles - Boeing

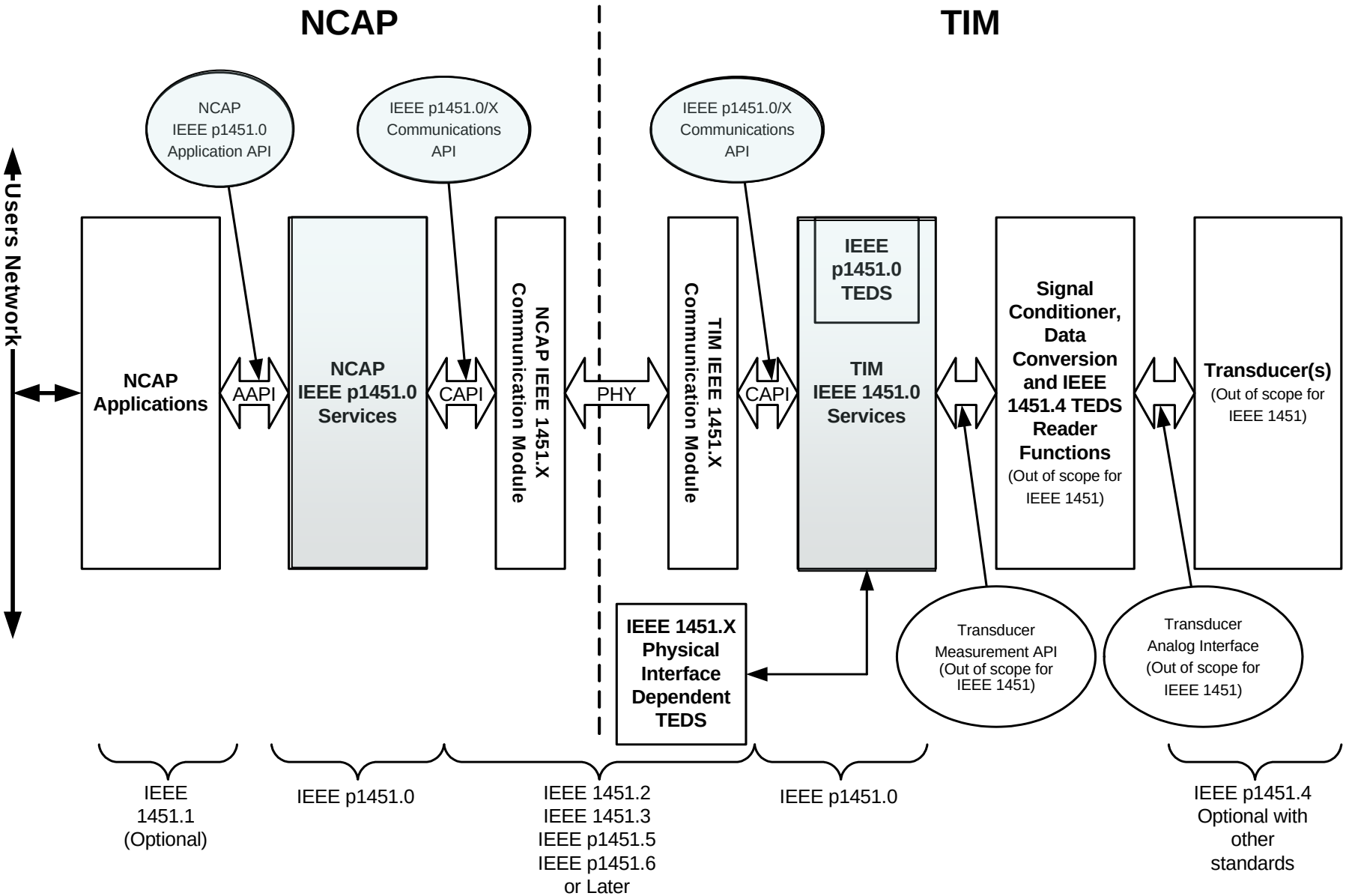
IEEE 1451.0 Responsibilities

- Command Interface to the Transducer Interface Module (TIM)
- Message Exchange Protocols
- Transducer Electronic Data Sheet (TEDS) Definition and management
- Interface protocols with 1451.1 and 1451.X
- Discovery and management of TIMs
- Application of calibration data

1451 Overall Architecture



1451 Overall Architecture



1451 Command Structure

- Commands processed in the TIM
- Command has 2 parts; command class and actual command
- Class sets up major architecture divisions i.e. initialization, self test, setup, triggering, transfer data, TEDS configuration, etc.

Command Structure

- Command is 2 octets (bytes)
- First octet is Command Class
- Second octet is Command
- Followed by command dependent parameters

Response Structure

- In response to a command
- First Octet is Command Class
- Second Octet is Command
- Third Octet is Status
- Followed by command dependent response octets

TEDS

- Transducer Electronic Data Sheet
- Resides in the TIM
- Accessed through commands
- Contains information about the sensor
- Identification, configuration, scaling, calibration, trigger, setup, timing, etc
- In actuality not one structure, but several

TEDS Types

REQUIRED

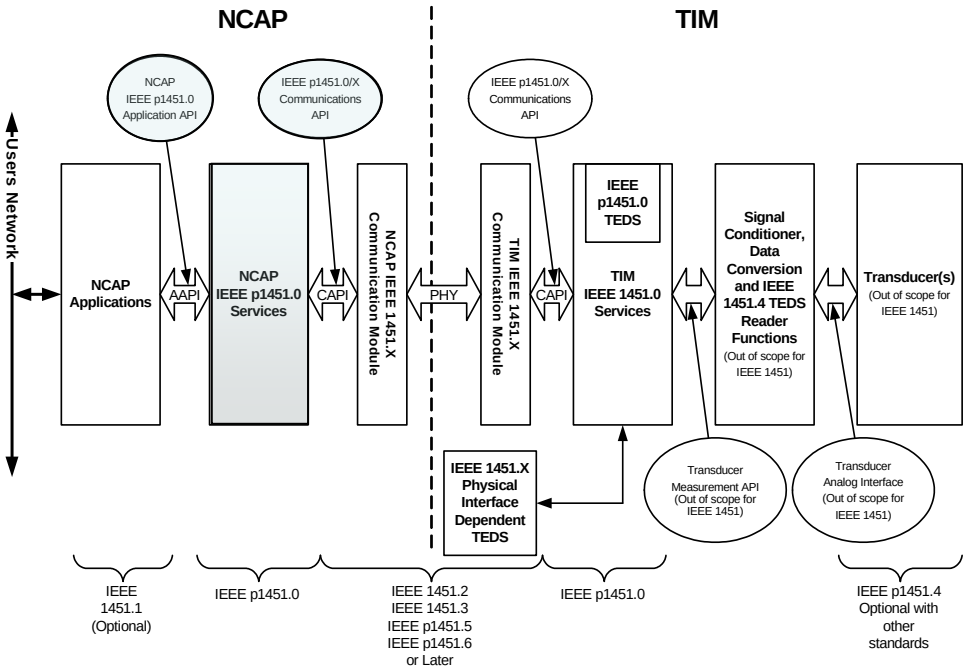
- Meta TEDS – Identification and type
- Transducer Channel TEDS – Type, units, range and timing constraints
- User’s Transducer Name TEDS
- PHY TEDS (beyond scope of 1451.0)

TEDS Types (cont)

OPTIONAL

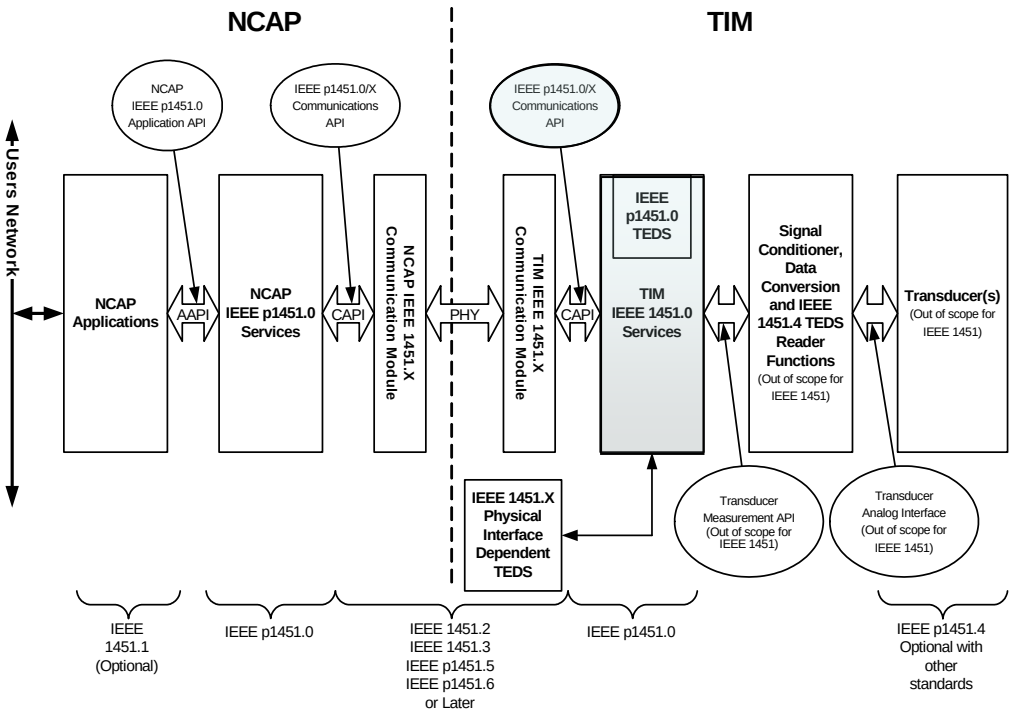
- Calibration TEDS
- Transfer Function TEDS
- Frequency Response TEDS
- Text Based TEDS – Operator Information
- Manufacturer Defined TEDS
- End User App TEDS – Totally undefined
- Physical TEDS – 1451.x configuration

1451.0 NCAP Functions



- TIM Discovery
- TEDS Management
- Data Correction
- 1451.x Communications Abstraction
- TEDS interpretation and distribution

1451.0 TIM Functions



- 1451.x Message Abstraction
- Read, Write, Trigger transducer.
- Command interpretation and execution
- TEDS storage and management