

**A Proposal for IEEE P1451.5, Standard for a Smart Transducer Interface for Sensors and Actuators - Wireless Communication Protocols and Transducer Electronic Data Sheets (TEDS) Formats**

**Submission Title:** [Organize IEEE P1451.5 Using the Architecture Proposed for IEEE P1451.0]

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**Re:** [Call for Proposals dated February 4, 2003; Doc. <related doc #'s>]

**Abstract:** [The IEEE P1451.5 standard should be organized in a way that promotes interoperability with the other members for the IEEE P1451 family, as well as facilitates the incorporation of different, perhaps multiple, physical layers into the standard.]

**Purpose:** [Response to the Wireless Sensor Working Group Chair's Call for Proposals]

**Notice:** This document has been prepared to assist the working group in defining the IEEE P1451.5 draft standard. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

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# < Organize IEEE P1451.5 Using the Architecture Proposed for IEEE P1451.0 >

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# Background and Rationale

- There is a growing desire for commonality and interoperability among the members of the IEEE P1451 family
- Wireless sensing is a dynamic and very broad requirement and it may not be possible to select a physical layer immediately, or even to select a single physical layer, for IEEE P1451.5.
- IEEE P1451.0 was proposed to:
  - Encourage compatibility across the IEEE P1451 family
  - Make it easy to develop IEEE P1451 standards using new physical layers

# IEEE P1451.0 Status

- Study Group appointed October, 2002
  - Included all past and present Working Group chairs
- Study Group Defined:
  - Vision for IEEE P1451.0
  - Proposed IEEE P1451 family interoperability guidelines
  - Block diagrams illustrating the architecture concept
- Project Authorization Request (PAR) for IEEE P1451.0 approved by IEEE on March 20, 2003

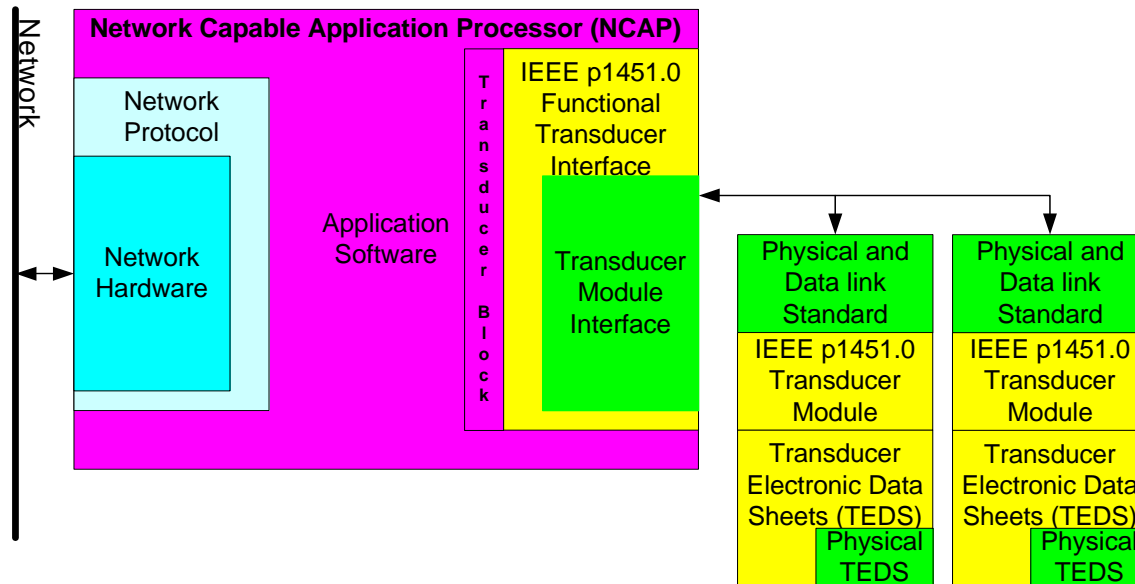
# IEEE P1451 Family Guidelines

- IEEE P1451 core values must be met
  - Each standard must define mechanism for providing all data, including the core TEDS to be defined in IEEE P1451.0, necessary to meet core values of the family.
- Interfaces are defined, not modules
- Partitioning is invisible beyond the immediate interface
- Hot swaps must be allowed and passed on

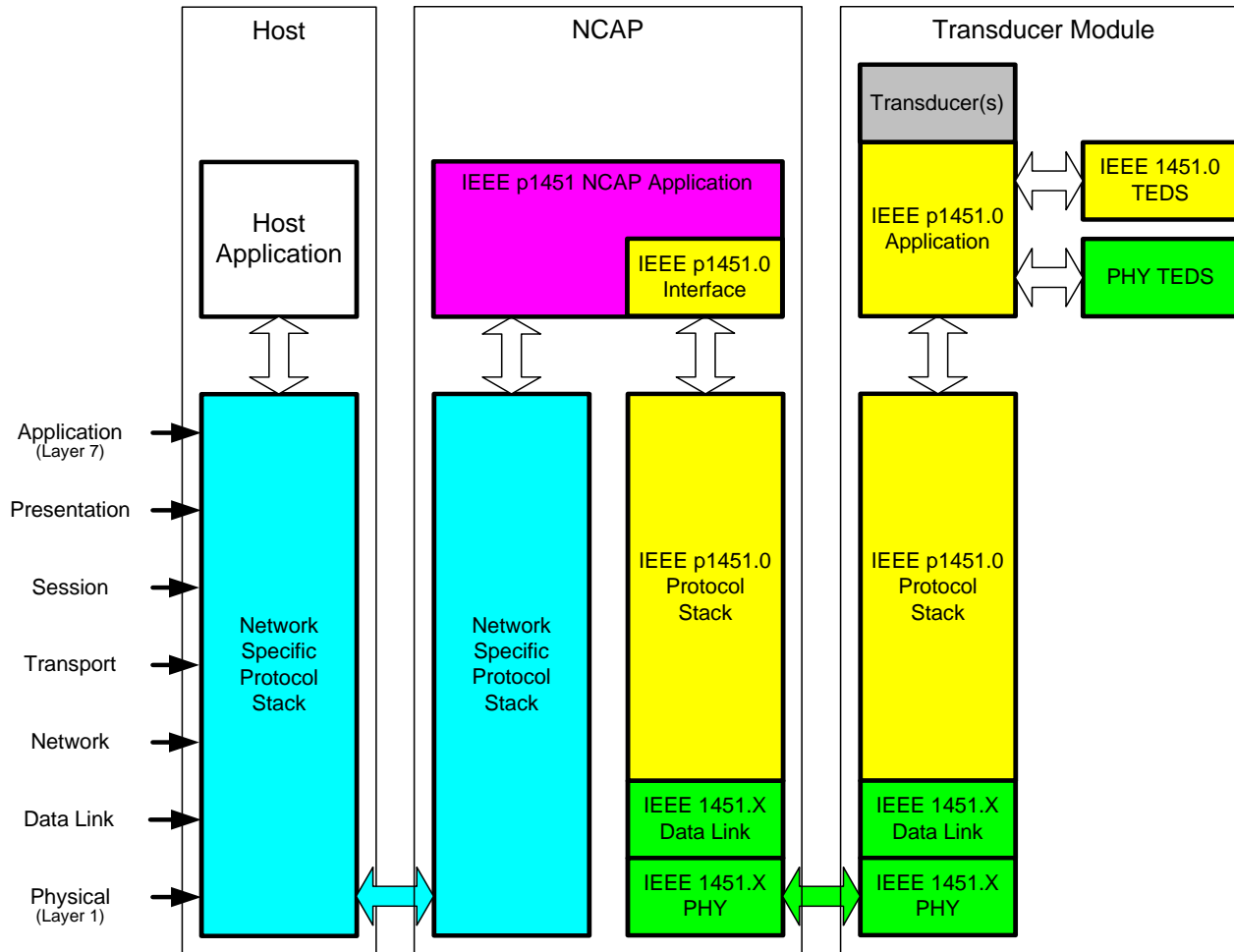
# IEEE P1451.0 Block Diagram

Legend

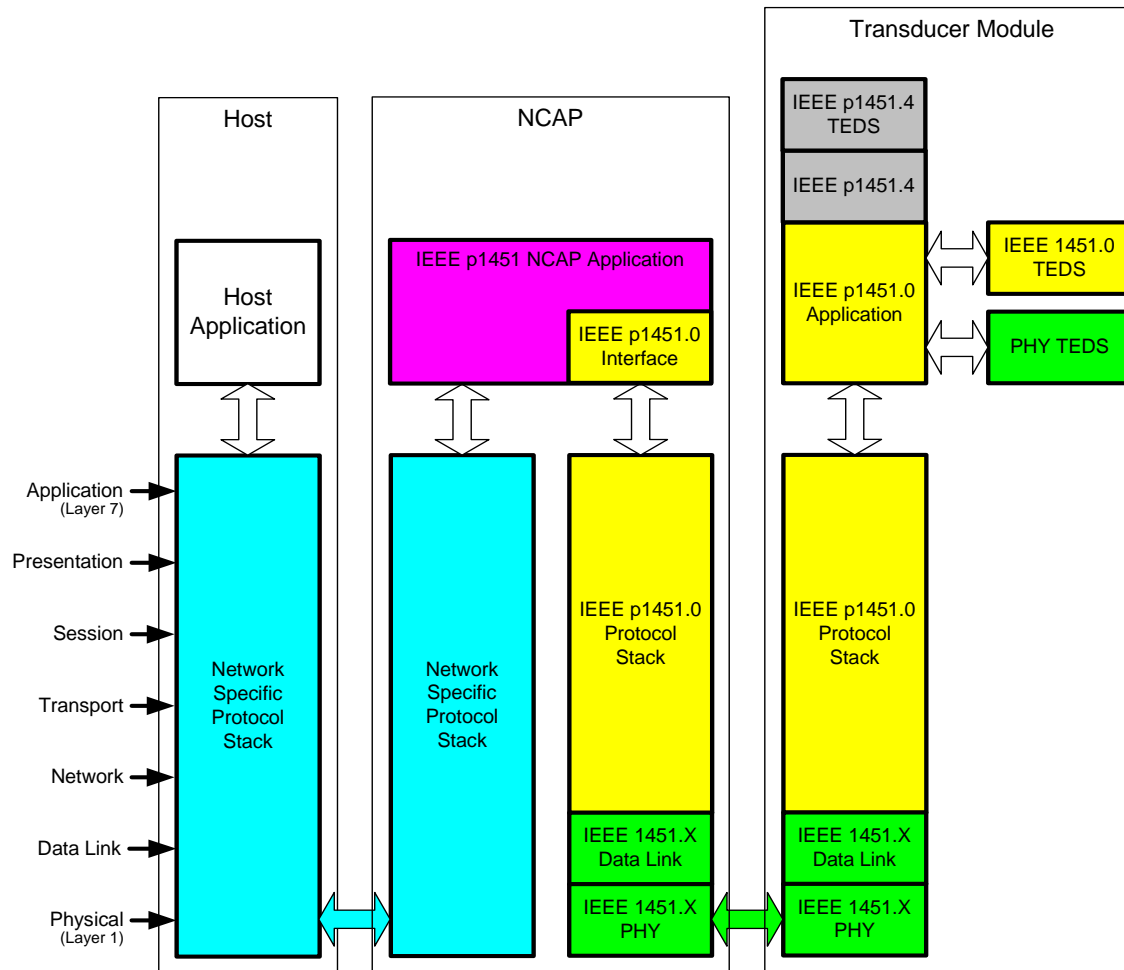
- Optional Network Standards (Not 1451)
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- IEEE 1451.X NCAP (May include IEEE 1451.1 or other software interface)
- IEEE p1451.0 Functional Standard
- IEEE 1451.2, IEEE p1451.3, IEEE p1451.4, IEEE p1451.5 or etc.



# IEEE P1451.0 Architecture



# IEEE P1451.0 with P1451.4



# Proposal

- Organize the IEEE P1451.5 standard in a way that allows separating the physical layers from the upper layers of the protocol stack
- Maintain close coordination between the IEEE P1451.5 and IEEE P1451.0 Working Groups

# Advantages to IEEE P1451.5

- Take advantage of the efforts of the IEEE 1451.0 Working Group, particularly including the common TEDS, sensor operating and control model, and perhaps protocol
- Maintain flexibility of the IEEE P1451.5 standard to support different, or perhaps even multiple, physical layers
- Ensure that IEEE P1451.0 is responsive to the special needs of the IEEE P1451.5 standard