IEEE 1451.5

Sensors Expo Detroit

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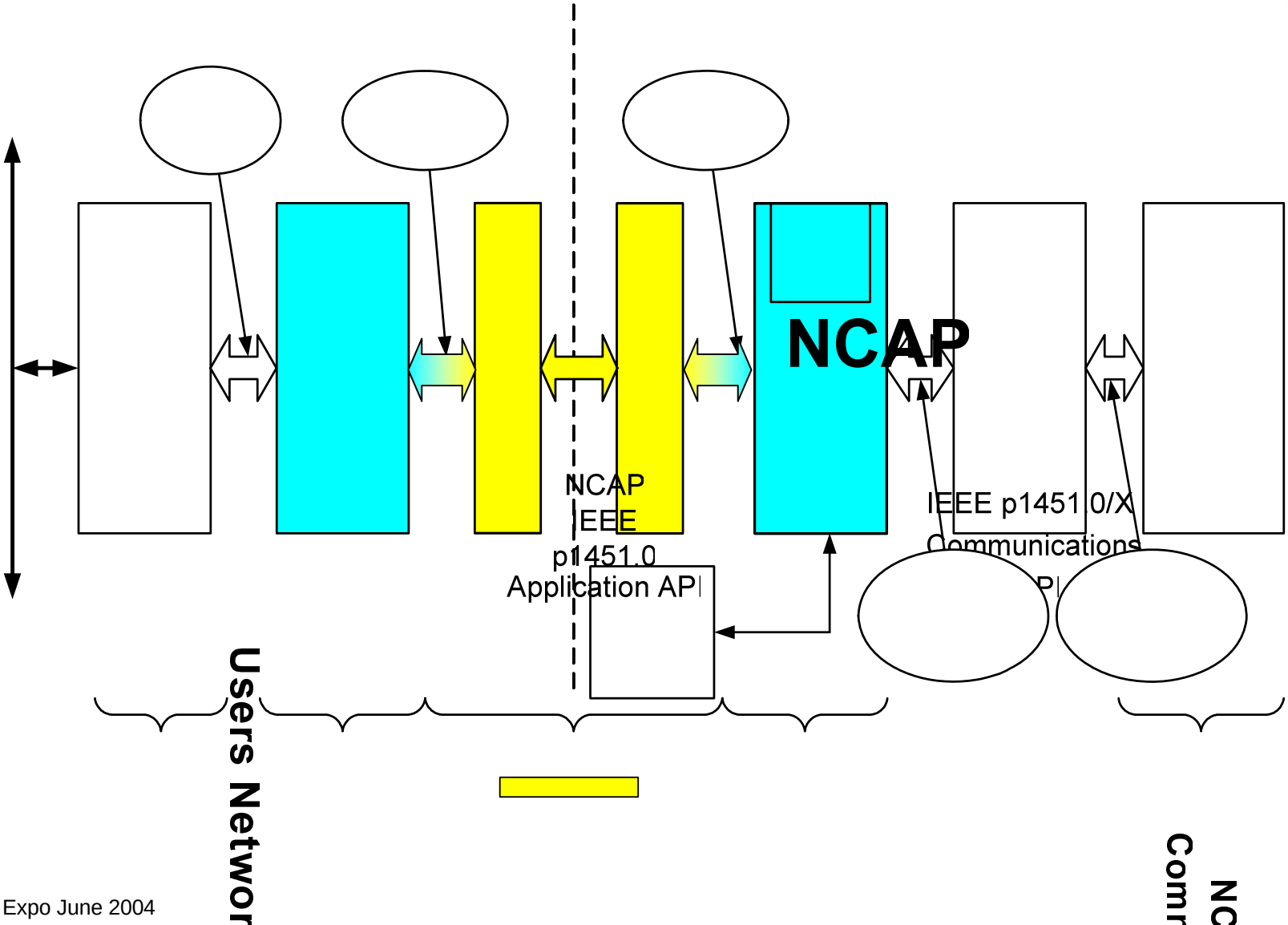
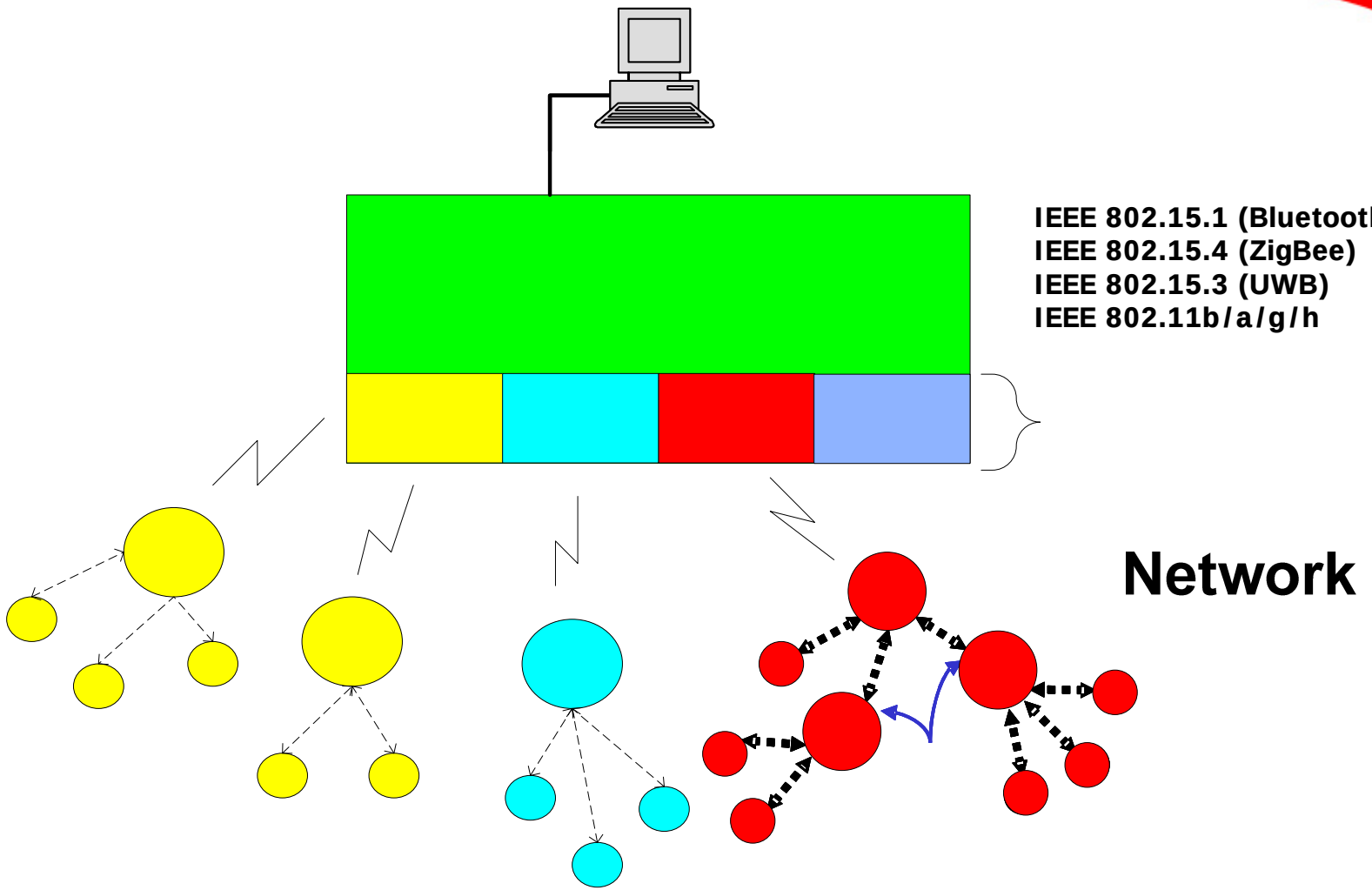
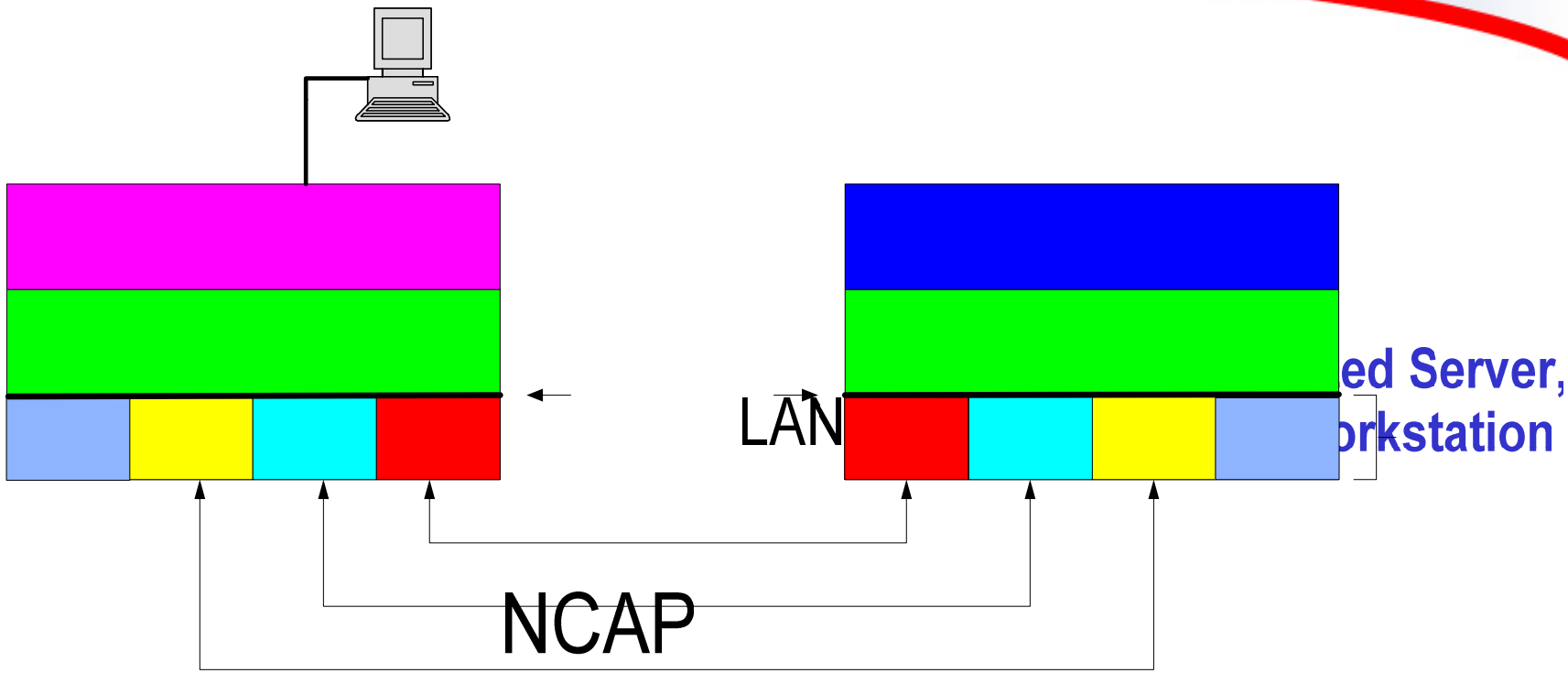
The 1451 Reference Model



Envisioned Wireless Structure



Relationship Between 1451.5 and 1451.0



IEEE 1451.5 focuses on:

- IEEE 1451.0 to 1451.5 Communications APIs
- IEEE 1451.5 PHY TEDS (e.g., 802.11/BT/ZigBee/future PHYs)
- Commands that terminate in 1451.5 Layers
- 1451.5 References 802.11, BT, ZigBee Radio Protocols

Applications

1451.0

P1451.5 Use of Core P1451.0 TEDS

- **Meta TEDS (Dot0 Required)**
  - Store worst-case timing parameters used by the NCAP to set time-out values to determine when the TIM is not responding. The remainder of this TEDS describes the relationships between the Transducer Channels that exist within the TIM.
- **Transducer Channel TEDS (Dot0 Required)**
  - Provides detailed information about a specific transducer: what physical parameter is being measured or controlled, the range over which the Transducer Channel operates, the characteristics of the digital I/O, the operational mode(s) of the unit and the timing information.
- **User's Transducer Name TEDS (Dot0 Required)**
  - (legacy "Commissioning" TEDS)
  - This TEDS is intended to provide a place for the user of the transducer to store the name by which the system will know the transducer. The structure of this TEDS is recommended in the standard but since the contents are user defined it cannot be required. All the manufacturer of the TIM needs to do is to provide the blank non-volatile memory that the user can write using the standard TEDS access methods.
- **1451.5-Specific PHY TEDS**
  - **802.11 PHY TEDS**
  - **Bluetooth PHY TEDS**
  - **ZigBee PHY TEDS**

1451.5 Envisioned 802.11 TEDS

802.11 MAC Attributes

dot11OperationTable ::= {dot11mac 1}
dot11CountersTable ::= {dot11mac 2}
dot11GroupAddressesTable ::= {dot11mac 3}

802.11 PHY Attributes

dot11PhyOperationTable ::= {dot11phy 1}
dot11PhyAntennaTable ::= {dot11phy 2}
dot11PhyTxPowerTable ::= {dot11phy 3}
dot11PhyFHSSTable ::= {dot11phy 4}
dot11PhyDSSSTable ::= {dot11phy 5}
dot11PhyIRTable ::= {dot11phy 6}
dot11RegDomainsSupportedTable ::= {dot11phy 7}
dot11AntennasListTable ::= {dot11phy 8}
dot11SupportedDataRatesTxTable ::= {dot11phy 9}
dot11SupportedDataRatesRxTable ::= {dot11phy 10}

1451.5 Envisioned ZigBee TEDS

ZigBee MAC Attributes	**ZBmacAckWaitDuration** **ZBmacAssociationPermit** **ZBmacBattLifeExt** **ZBmacBeaconOrder** **ZBmacBeaconTxTime** **ZBmacGTSPermit** **ZBmacMaxCSMABackoffs** **ZBmacMinBE** **ZBmacRxOnWhenIdle** **ZBmacSuperframeOrder**
ZigBee PHY Attributes	**ZBphyChannelsSupported** **ZBphyTransmitPower** **ZBphyCCAMode**

Envisioned API with Dot0

- **Open**
  - Format: OPEN (local port, foreign socket, active/passive [, timeout] [, precedence] [, security/compartment] [, options]) -> local connection name
- **Send**
  - Format: SEND (local connection name, buffer address, byte count, PUSH flag, URGENT flag [,timeout])
- **Receive**
  - Format: RECEIVE (local connection name, buffer address, byte count) -> byte count, urgent flag, push flag
- **Close**
  - Format: CLOSE (local connection name)
- **Status**
  - Format: STATUS (local connection name) -> status data
- **Abort**
  - Format: ABORT (local connection name)
- **Publish/Subscribe (TBD)**

1451.5 Future

- Rigorously define IEEE 1451.0/5 Communications API (CAPI)
  - Publish/Subscribe & SetQoS need work
- Fully Define the 1451.5 PHY TEDS structure
  - 802.11
  - Bluetooth
  - ZigBee
- Establish “thin” 1451.5 convergence layer above 802.11, BT, ZigBee
  - Only required if Dot0 “staircase” approach abandoned
- Joint 1451 Working Group meetings being held from 6pm – 9pm at Sensors Expo
- Plan to complete *rough* draft 1451.5 by July 31, 2004.