BACnet Ontology

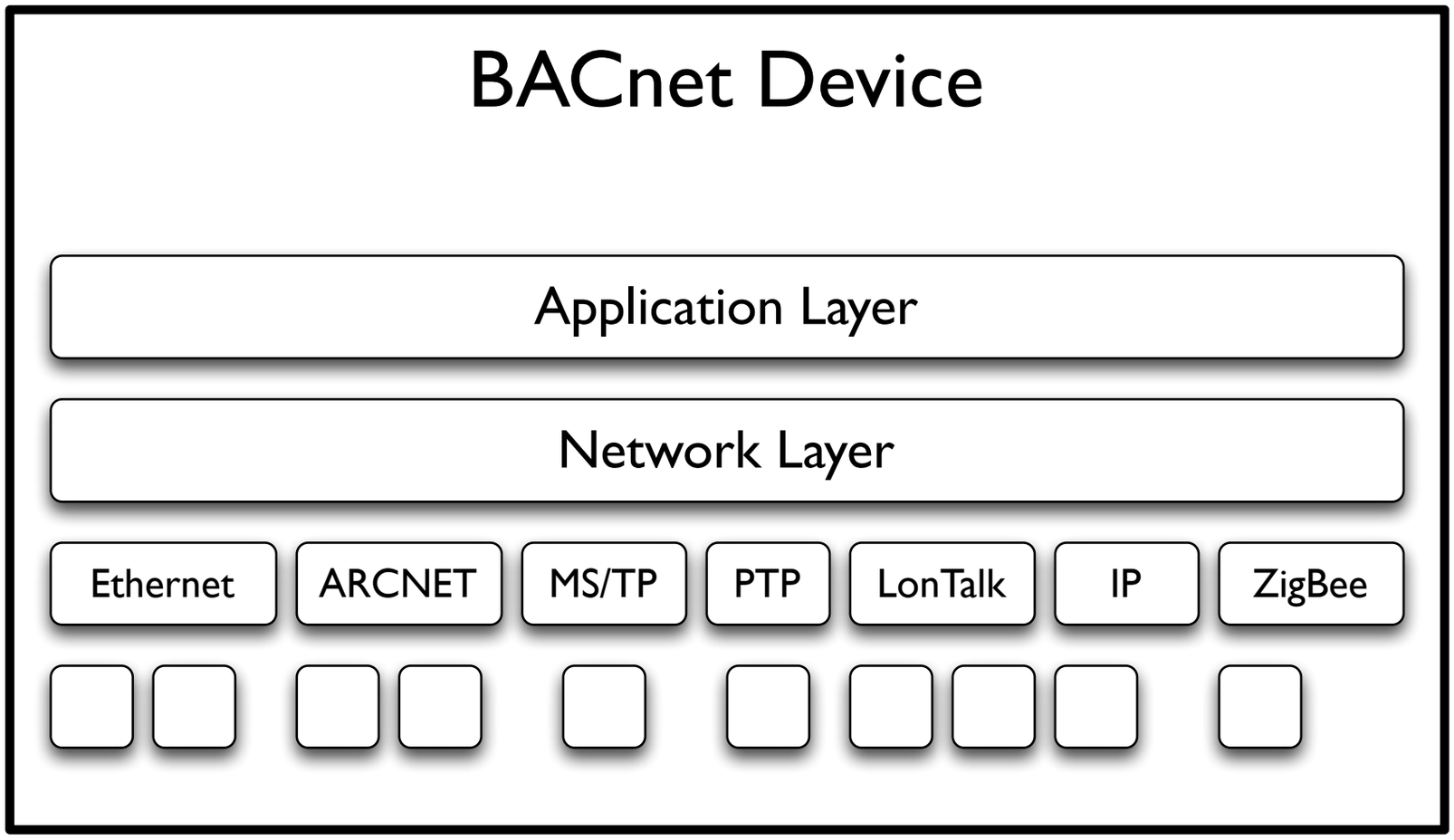
From text and ASN.1 to OWL

I

BACnet

- BACnet - A Data Communications Protocol for Building Automation and Control Networks
  - Developed as ASHRAE standard
  - ANSI, European, ISO standard
- Formal model without a formal description
  - Descriptive text, constrained natural language
  - ASN.1 as text, never intended to be “compiled”

BACnet Communications



BACnet Link Layer

- Modeling Considerations
  - Defines its own link layer - MS/TP
  - Uses other link layers in a standard way - ARCNET
  - Additional layer on top of IP/UDP
  - MAC layer percolates up to application layer as octet strings
- Out of scope for hackathon

BACnet Network Layer

- Modeling Considerations
  - Defines its own concept of a network
  - Defines services (network layer protocol data units) for discovering and managing the network
  - Percolates up to application layer as short unsigned
- Out of scope for Hackathon

BACnet Application Layer

- Collapsed transport, session, presentation, and application layers (not unusual)
- Definitions of devices, objects, properties, and services
  - Device identity is “bound” to network address
  - Object identity is “bound” to a device
  - Property identifiers are unsigned integers
- In the places I go there are things that I see that I never could spell if I stopped with the Z. ~~ Dr. Seuss

Intrinsic Challenges

- Datatype mapping - strings, octets, date, time, bit strings, lists, arrays
- Enumeration mapping - enumerations as type indicators, values, states
- Object mapping - required/optional properties, constrained and unconstrained datatypes
- Service (PDU) mapping - implicit component definitions

Extrinsic Challenges

- What is being measured, how it is being measured
- Where something is and what it serves
- Networks of things:
  - Packets and power - delivery of content between systems, power they need to function
  - Direct systems - performance, maintenance
  - Environment - graphs of spaces, containers
  - Energy - supply, demand, cost, smart grid

Project Team

- SourceForge project: http://bacowl.sf.net/