Home Control in a consumer's perspective

`www.iab.org/about/workshops`

`/smartobjects/papers/Brandt.pdf`

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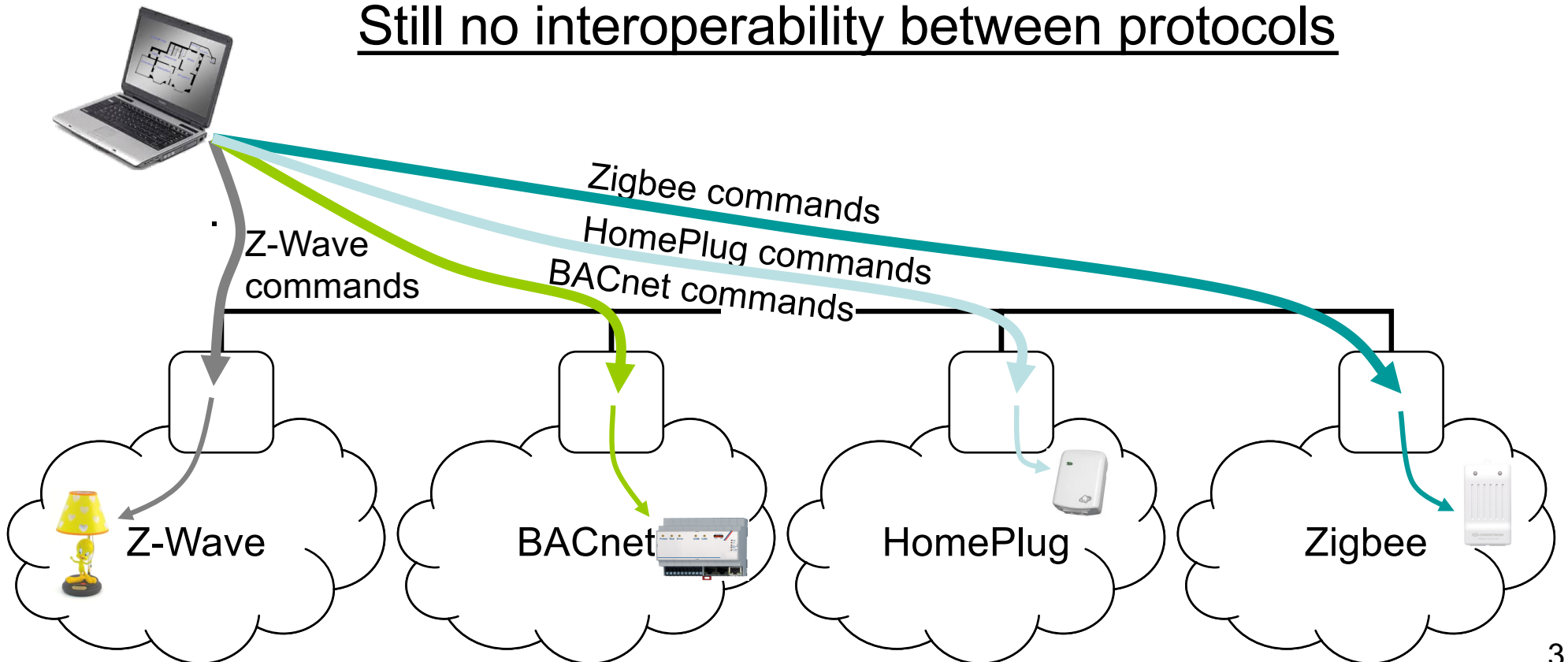Sigma Designs
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Today

- Many application protocols
  - BACnet, DALI, LonWorks, Z-Wave, HomePlug, Zigbee, ...

- Millions of devices installed

- Limited integration
  - Available product range: one standard only
    - Many "silos": HVAC, fire alarms, ...
    - Limited competition $\Rightarrow$ Higher cost
    - High cost $\Rightarrow$ Limited market growth
    - ...
      .

Today, Cont'd

- Application protocol transport over IP
  - One network $\Rightarrow$ Simpler installation and management

Still no interoperability between protocols

Zigbee commands

HomePlug commands

BACnet commands

Z-Wave commands

Z-Wave

BACnet

HomePlug

Zigbee

One common platform?

- What if
  - resources could be discovered across subnets?
  - legacy protocols could interoperate?
  - IP really supported battery operated nodes?

- Are we looking for
  - a one fits all solution?
  - support for any device in the world?
  - 85% support for 85% of devices?

How to migrate?

- Incremental steps

  1. Legacy protocol over IP (UDP encapsulation)

  2. Add IP connectivity to devices that were never built for IP networking (=> gateways)

  3. Add discovery functionality (to gateways)

  4. Introduce native devices built for discovery and an interoperable protocol

  5. Vendor-specific advanced features?

What is required?

- A discovery protocol to advertize
  - Local resources ✓ (CoAP, mDNS, etc.)
  - Resources in other subnets
  - Legacy devices in other subnets
  - Sleeping nodes
    - e.g. Temperature sensors and door locks
    .

What is required?

- A discovery protocol that
  - Does not rely on multicast
  - MAY use multicast if supported by a subnet
  - Does not flood LLN style networks with traffic
    - <u>Most discoverable properties are static</u>

- One candidate:
  - `draft-brandt-coap-subnet-discovery`
  - .

What is required?

- Application compatibility:
  M2M style command sets
  - Short, strictly defined paths, e.g.
    - /m2m/light/type [enum switch, dimmer]
    - /m2m/light/level [int 0..100]
  - "Sufficient" subset
    - Not trying to cover all functionality of all standards

  - Input needed from industry alliances

What is required?

- Backbone routing by default
  - (What happened to HomeGate?)

- IP battery support:
  - ICMP *"Destination Responding Slowly"*
    - IP host sends "Set temp threshold = x"
    - Border router resolves destination address to
      `node_type == sleeping`
    - Router returns ICMP "Destination Responding Slowly"
    - IP host increases application ack timeout value $\Rightarrow$ application command is not retransmitted n times

Thank You

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