



Appliances and Networks

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Questions to ponder

- Should *we want* to connect appliances to “the
- Will we?
- Why?
- Who benefits? How?
- What should appliance manufacturers do?
... retailers? ... Energy Star? ... technology?

We know

- Information Technology coming to appliances
 - Communication
 - Display
 - Computation
 - Storage

But we don't know

- What benefits we can get
- What solutions should look like
- How to get there

Communication — Information

... from grid

- price, other preferences
- commands

... from nearby devices in building

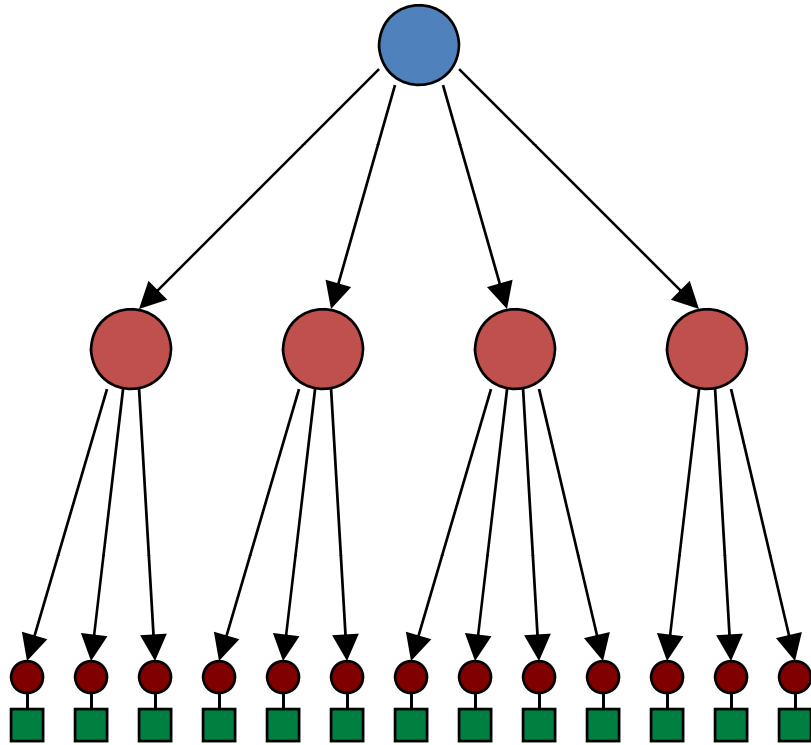
... to/from people

- remote user interfaces
- harvesting preferences

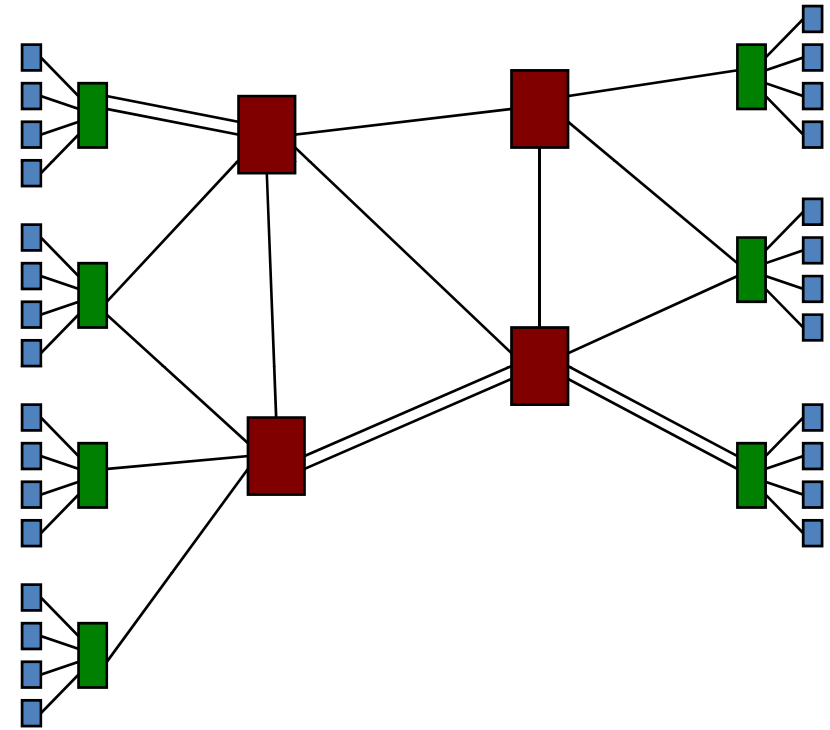
Computation

- Change behavior to **reduce energy use**
 - use information from other devices
- Change behavior to **reduce cost**
 - take into account dynamic prices
- **Report problems**
 - energy, e.g. fridge compressor on too much
 - functional, e.g. can't maintain temperature; door open
- **Benefits unrelated to energy**

Controls vs. Networks



- Locus of authority
- Integration of controls



- Fragility vs. robustness
- Ease of implementation

How products will behave

- Initially operate on own; have good defaults
- Discover relevant entities nearby
 - other devices
 - people
- Exchange information to enable better behavior
- Things change
 - environmental conditions; product operation; nearby devices; preferences

Strategy for networks

- Embrace network technology
- Go to real-time pricing ASAP
 - in-between solutions introduce unnecessary complexity
- Deliver value from other than saving energy or money

Also: iea-4e.org – click on **News** – look for ‘**Standby**’

How to get there

- Develop shared vision
- Use only open architecture, protocols
- Enable fully incremental networking

Energy Star role

- Accommodate reasonable technology needs
- Embrace limited # of standard network tech.
- Promote good user interfaces
- Promote remote monitoring

Thank you

