



## International Residential Energy Management Standards

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[www.kenwacks.com](http://www.kenwacks.com)

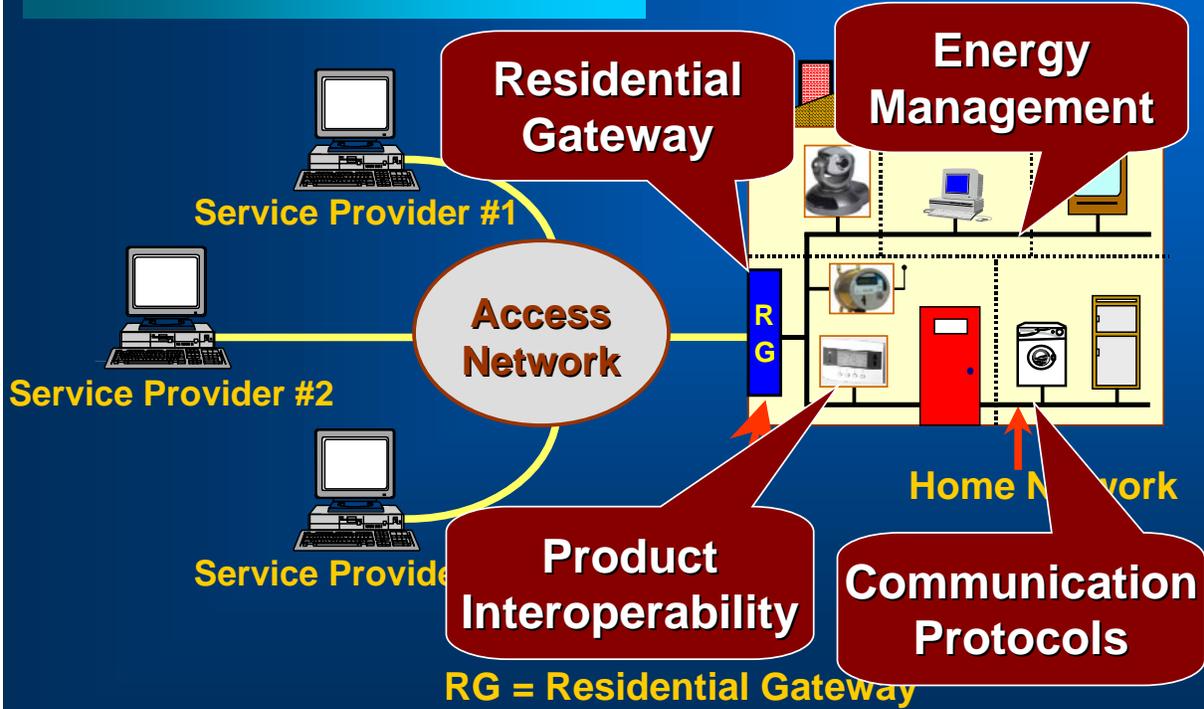
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## *Home Electronic System*



- International standards: **consensus** of member nations
- Standards organization
  - **ISO / IEC JTC 1** Information Technology standards
  - **SC 25** Interconnection of Information Technology
  - **WG 1** *Home Electronic System (HES)*
- Mission
  - World appliance
  - Uniform commands; Universal Interface
  - Support energy management
- A neutral forum for **convergence**
- HES smart grid standards: [iso.kenwacks.com](http://iso.kenwacks.com)

# Home System Standards

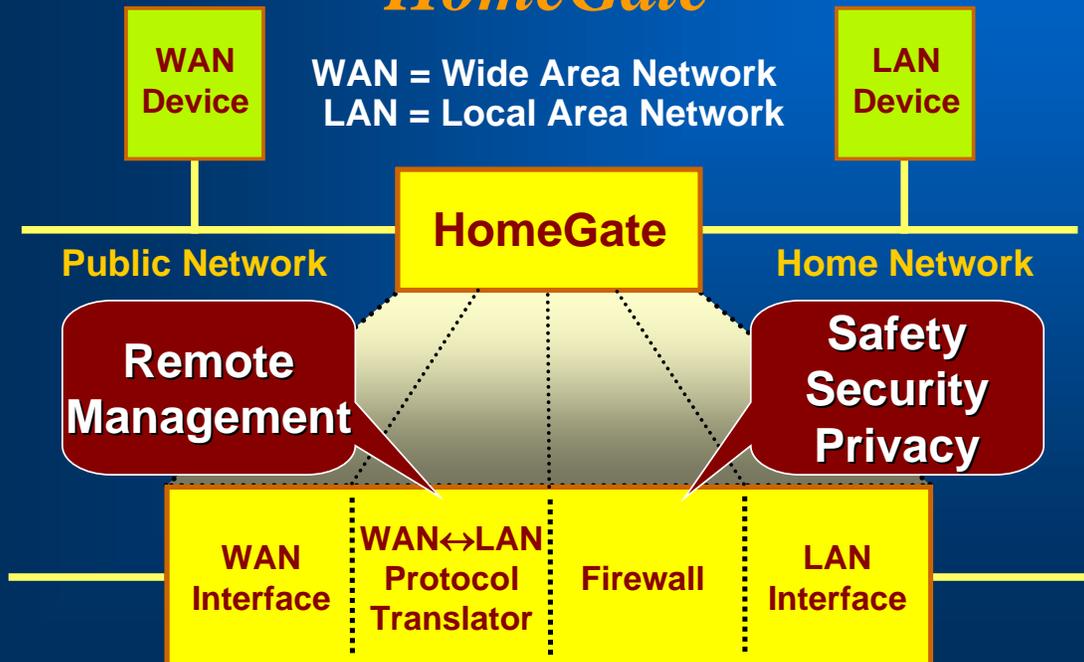


# Residential Gateway

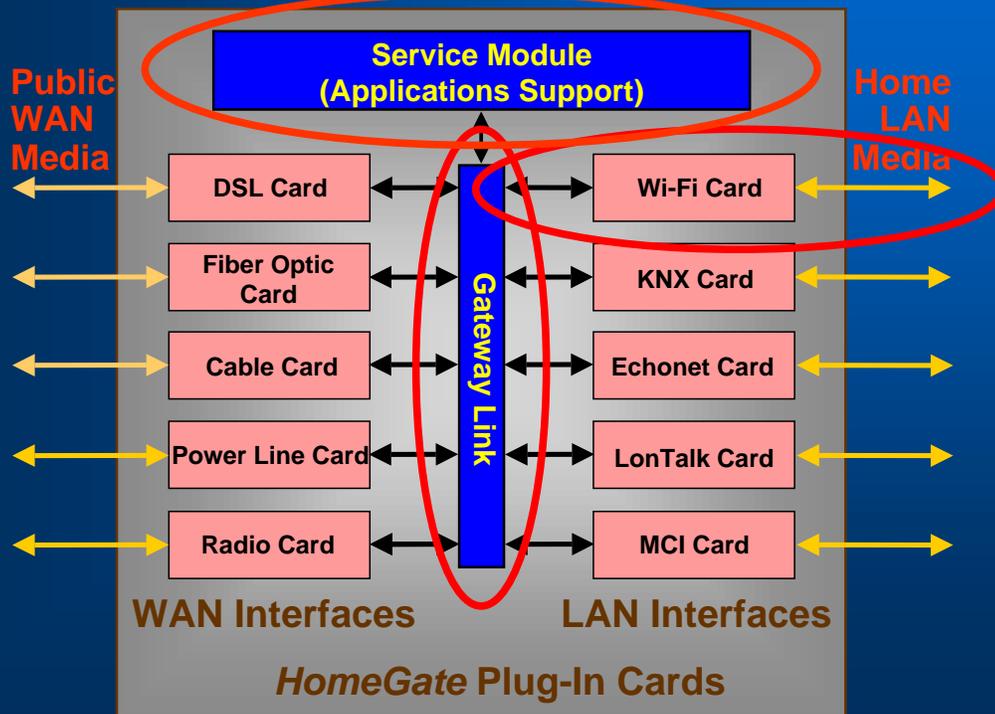


ISO/IEC 15045

## HomeGate



# HomeGate & Interoperability

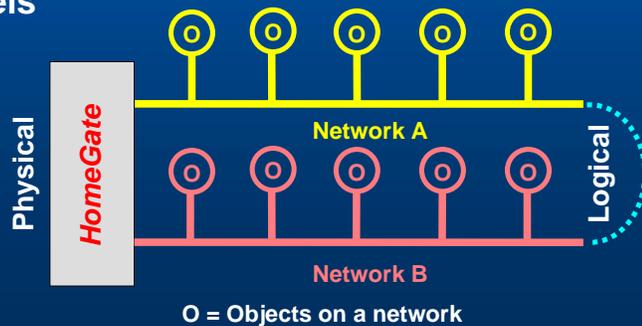


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# Interoperability Guidelines



- Facilitates interoperability among products:
  - From different manufacturers
  - Located on different home networks
- Issues: safety, addressing, configuration, lexicon
- Defines application models
  - Lighting
  - Security
  - HVAC control
  - Energy management
  - Audio/Video control

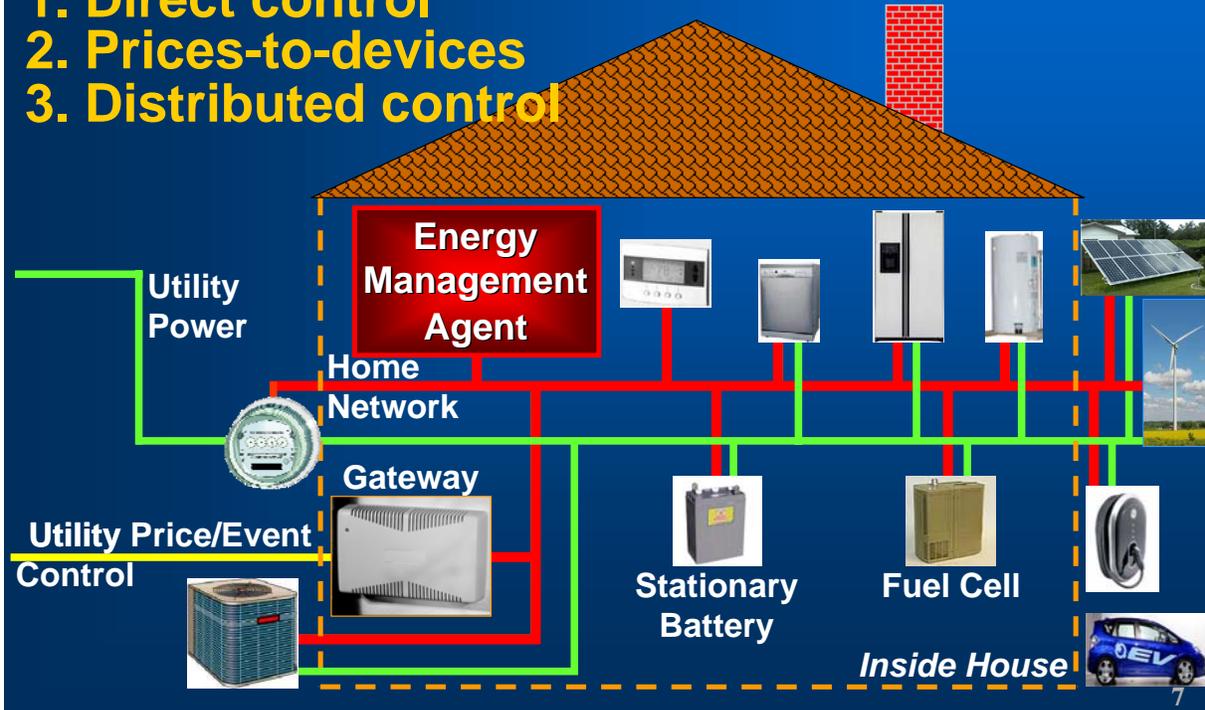


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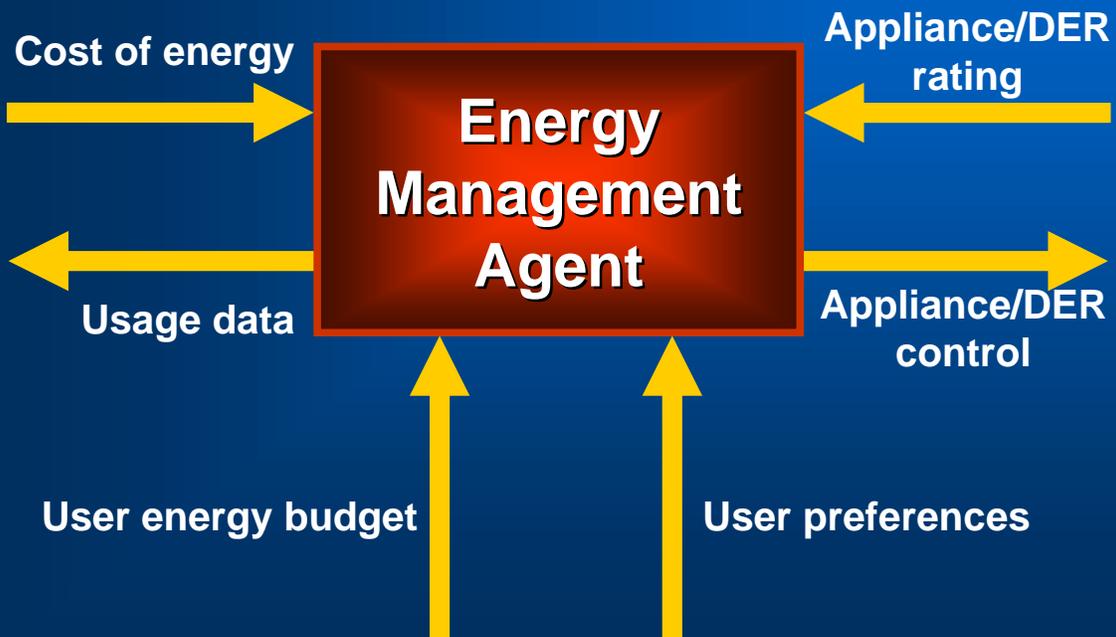
# Energy Management Model



1. Direct control
2. Prices-to-devices
3. Distributed control



# Energy Management Agent



# Simple Consumer Choices

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- 1. Wash dishes now.**
- 2. Delay wash by 3 hours and save 25¢.**
- 3. Delay wash by 6 hours and save 50¢.**