Architectures for LonWorks® Home Automation Systems

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Echelon

04H1122

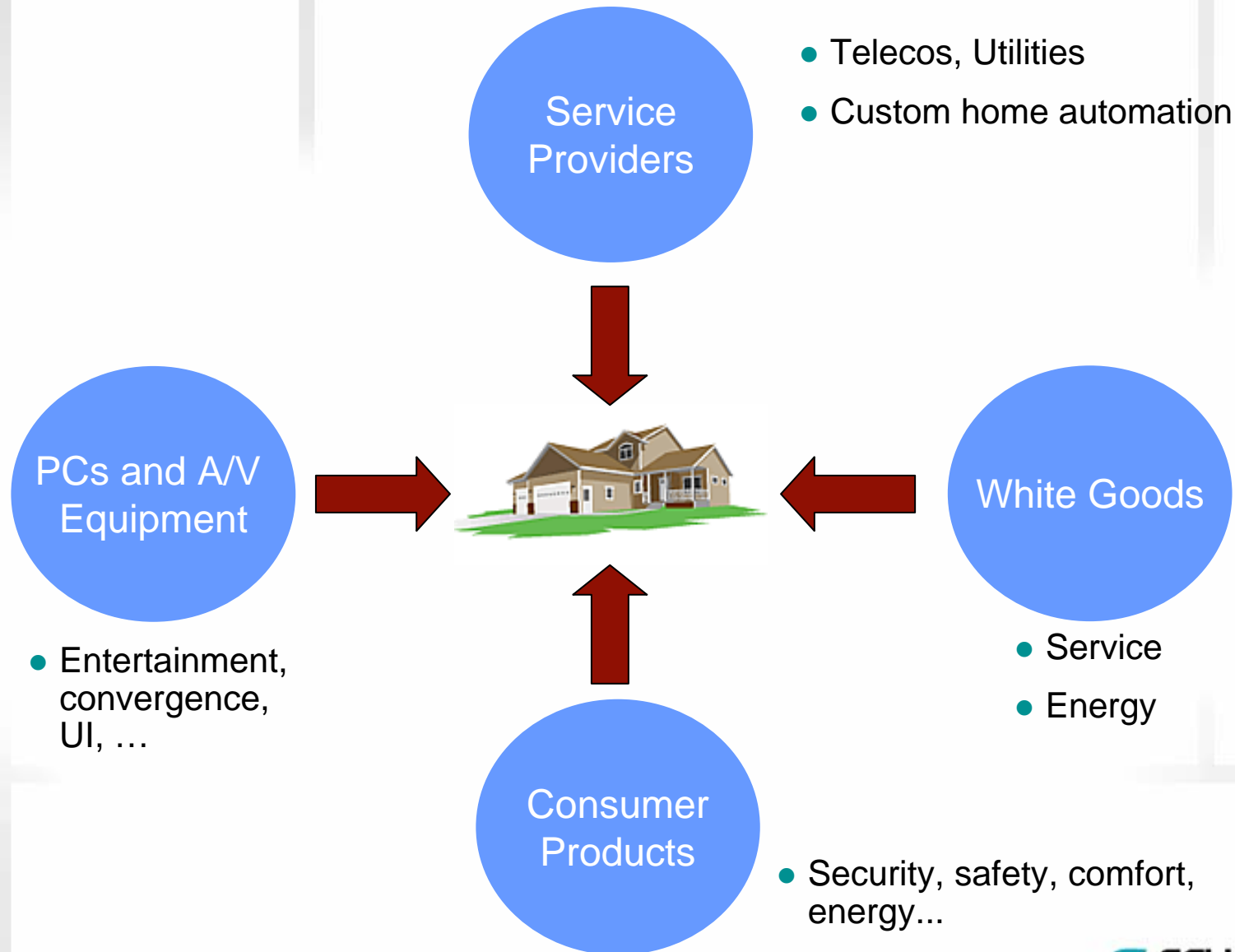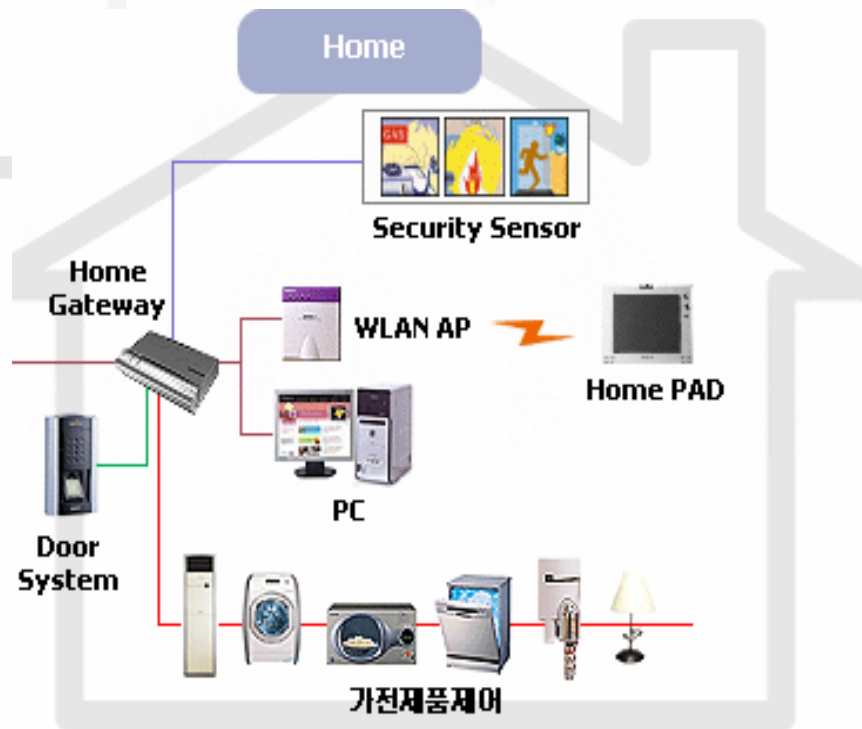# Home Automation Market
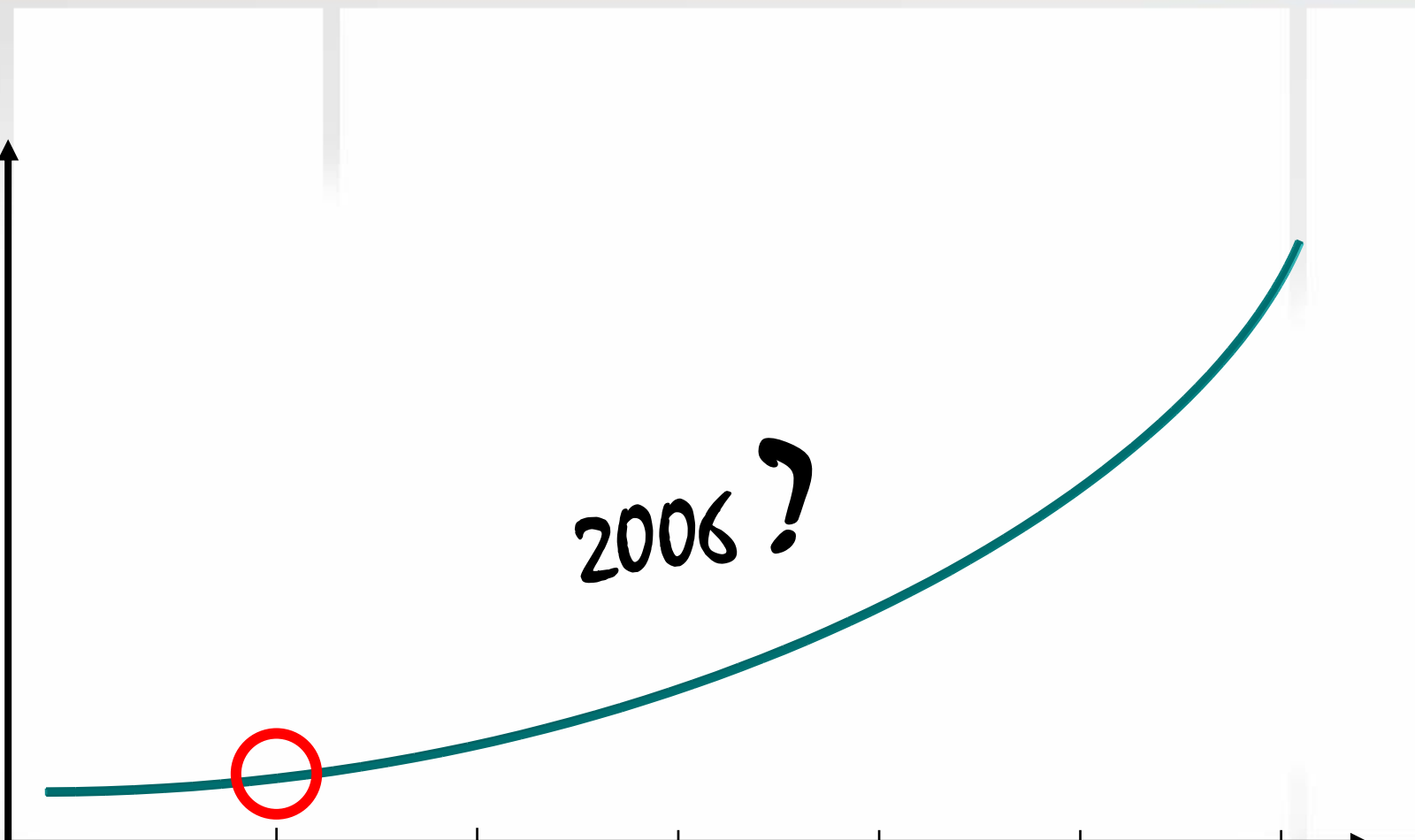
New Landscape

- LONWORKS® is now accepted as an open standard
  - ANSI/CEA 709.1/2, EN14908
- Echelon actively participates in CEN, CEA, ISO
  - Committees/members reveal new opportunities
- Active re-engagement with UPnP
  - Technical and steering committee
- Cost-effective power line solution
  - Power Line Smart Transceivers, switched-leg circuit
- Active involvement with CECED (European appliance manufacturers association)
  - Development of a powerful self-installation methodology
- Adoption by Samsung and Simon has garnered a lot of interest
  - Legitimized LONWORKS technology for use in home automation
- Emergence of market movers in international markets
 - Samsung
  - KyungDong
  - DongMoon

Market Entry Points

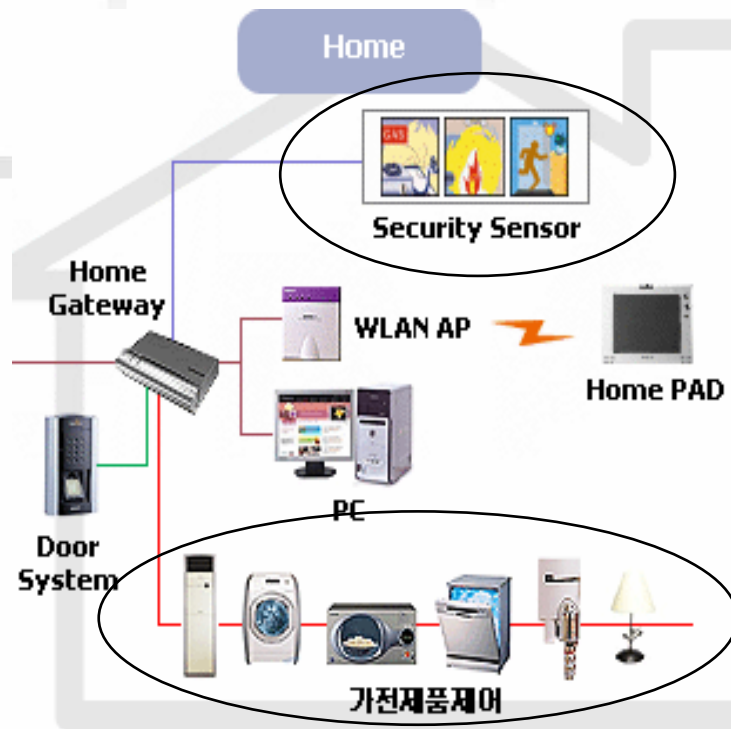**Service Providers**

- Telecos, Utilities
- Custom home automation

PCs and A/V Equipment

- Entertainment, convergence, UI, …

White Goods

- Service
- Energy

Consumer Products

- Security, safety, comfort, energy...

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Consumer Reasons

- *Useful* system applications
  - Safety
  - Security
  - Energy savings
  - Confort
  - Entertainment
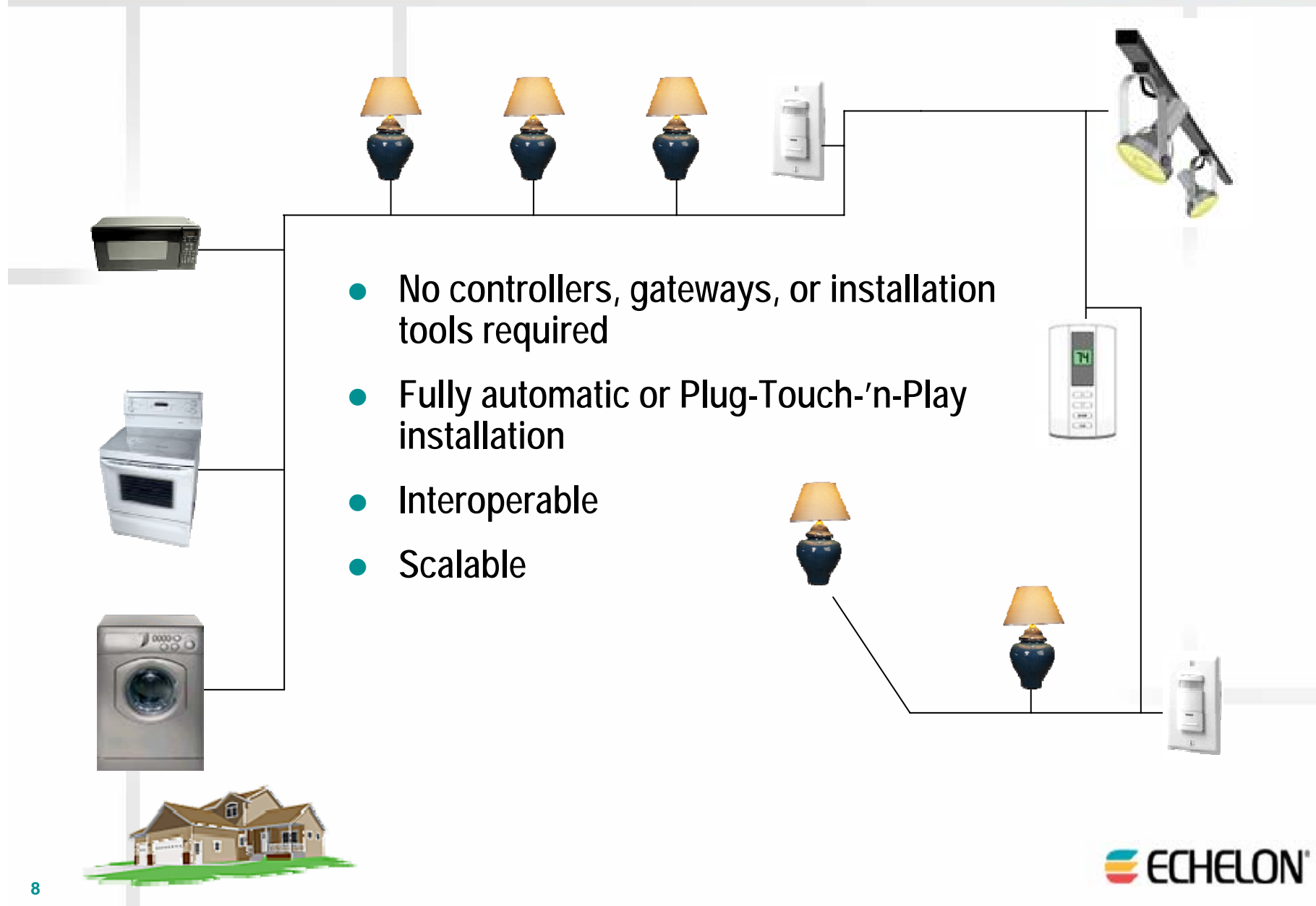- *"Show off"* factor

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Consumer Expectations
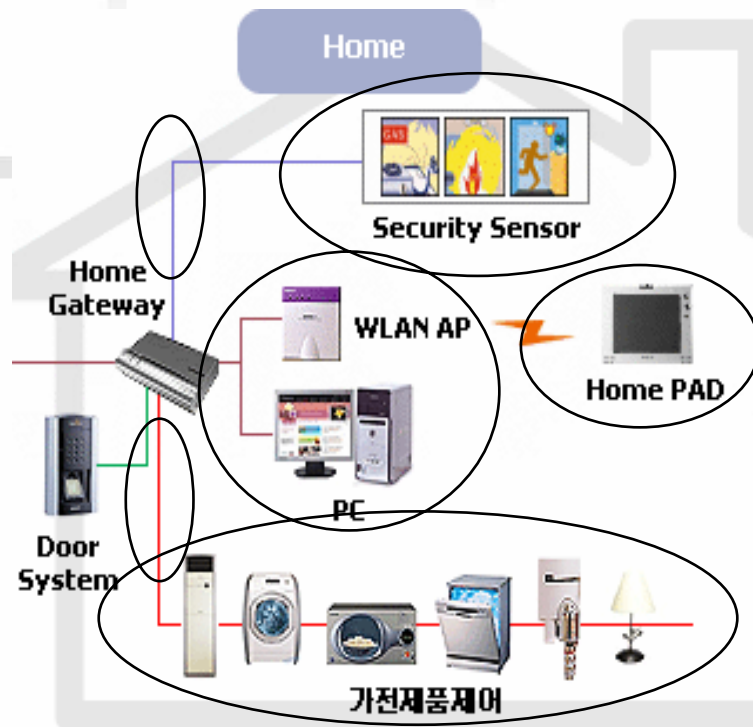
- *Easy configuration* and *installation*

- *Intuitive* controls

- Seamless *interoperation*

- *Security* and *reliability*

- *Integration* into data network

Consumer Expectations
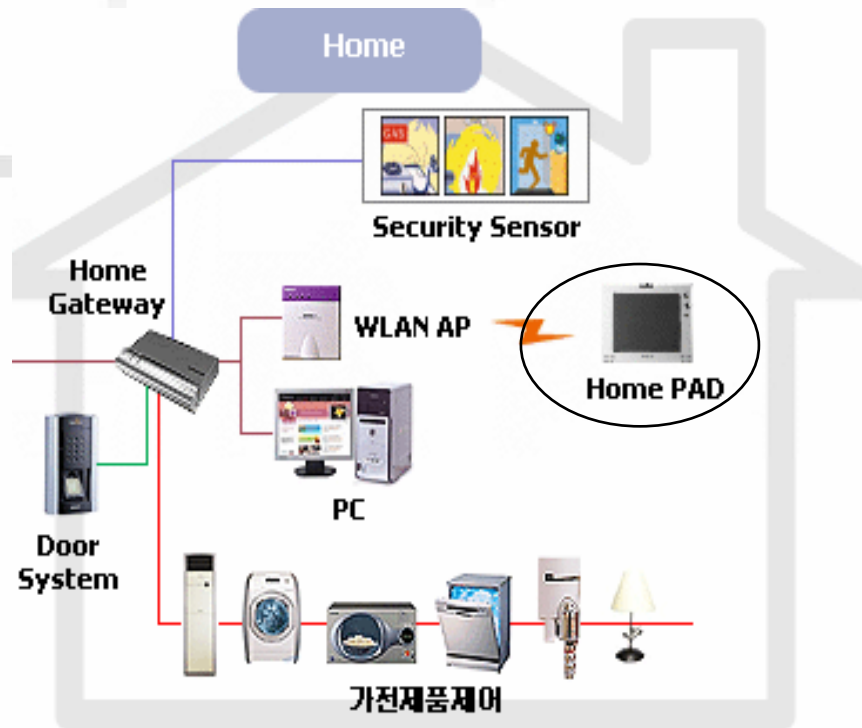

- *Easy configuration* and *installation*

Interoperable Self-Installation (ISI)

- No controllers, gateways, or installation tools required

- Fully automatic or Plug-Touch-'n-Play installation

- Interoperable

- Scalable

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Consumer Expectations

Home

Security Sensor

Home Gateway

WLAN AP

Home PAD

PC

Door System

가전제품제어

- ✓ *Easy configuration* and *installation*
- ● *Intuitive* controls

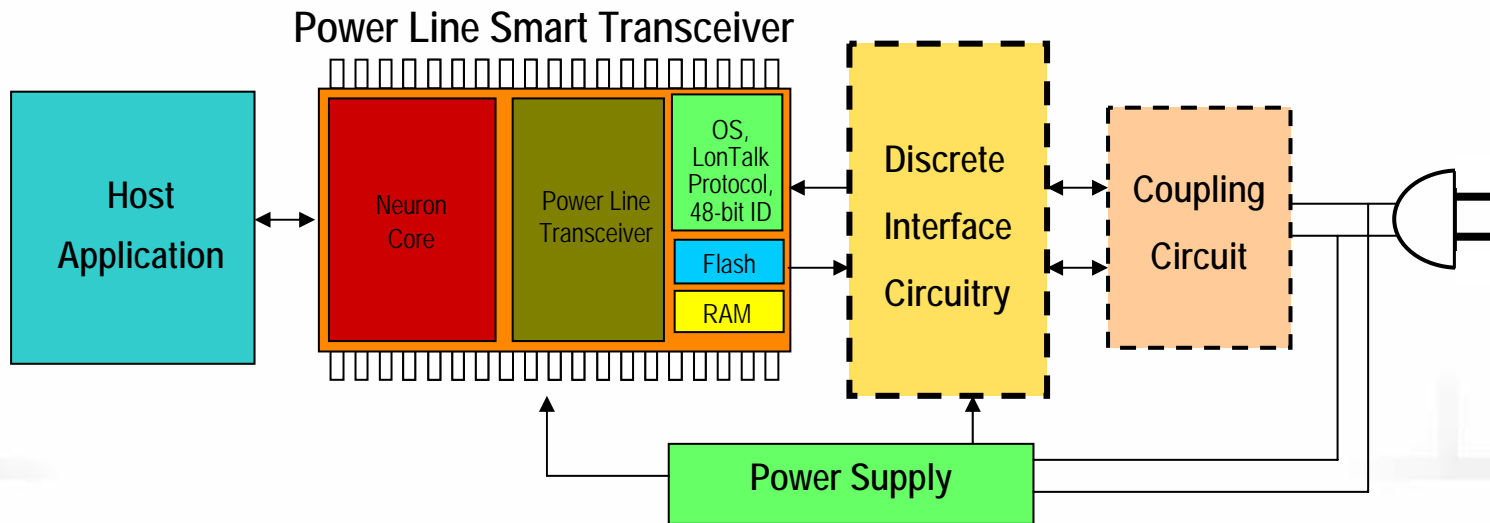ECHELON®

4HomeMedia UI / Software Architecture

- Intuitive, context-based user-experience for LONWORKS - based consumer devices

- Cross-platform user-interface (Media Center, mobiles, PDA) with real-time, two-way status

- Client-server and network-based architecture

- Extensible, XML-based platform

- Supports most computer OSs and MIPS Linux embedded devices

- OEM/ODM implementation-friendly software

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Consumer Expectations
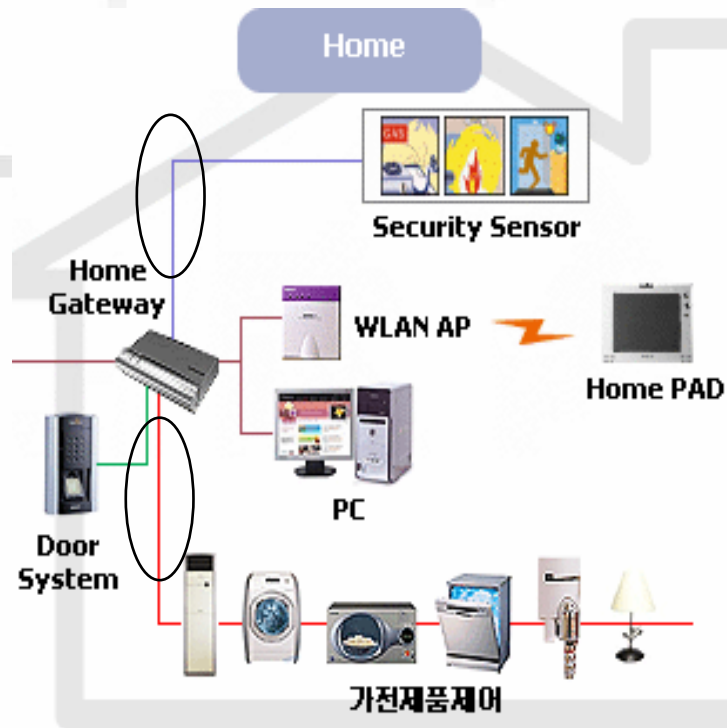
- ✓ *Easy configuration* and *installation*

- ✓ *Intuitive* controls

- ● *Security* and *reliability*

Powerline Technology

Power Line Smart Transceiver

Host Application

Neuron Core

Power Line Transceiver

OS, LonTalk Protocol, 48-bit ID

Flash

RAM

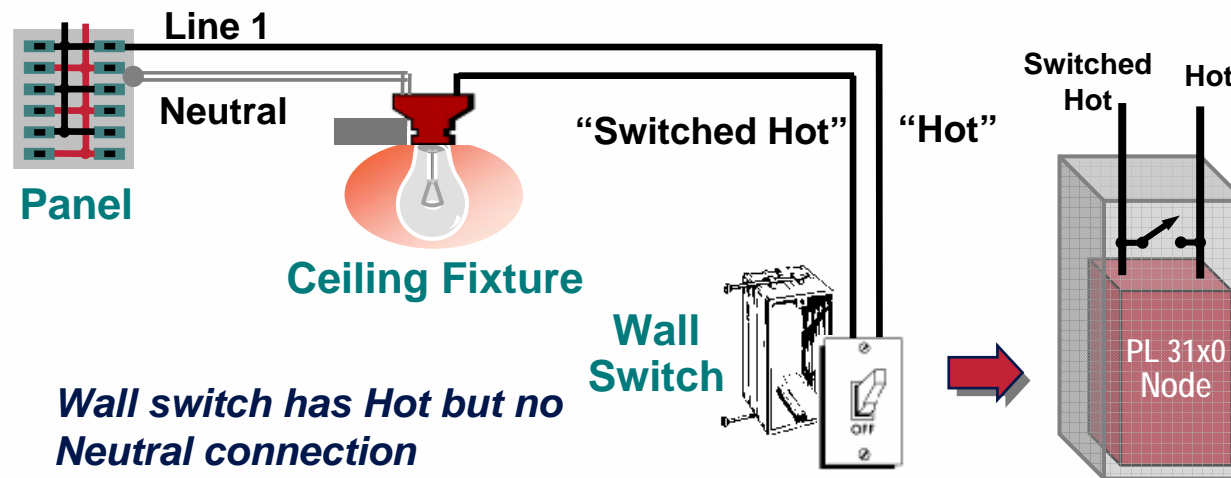Discrete Interface Circuitry

Coupling Circuit

Power Supply

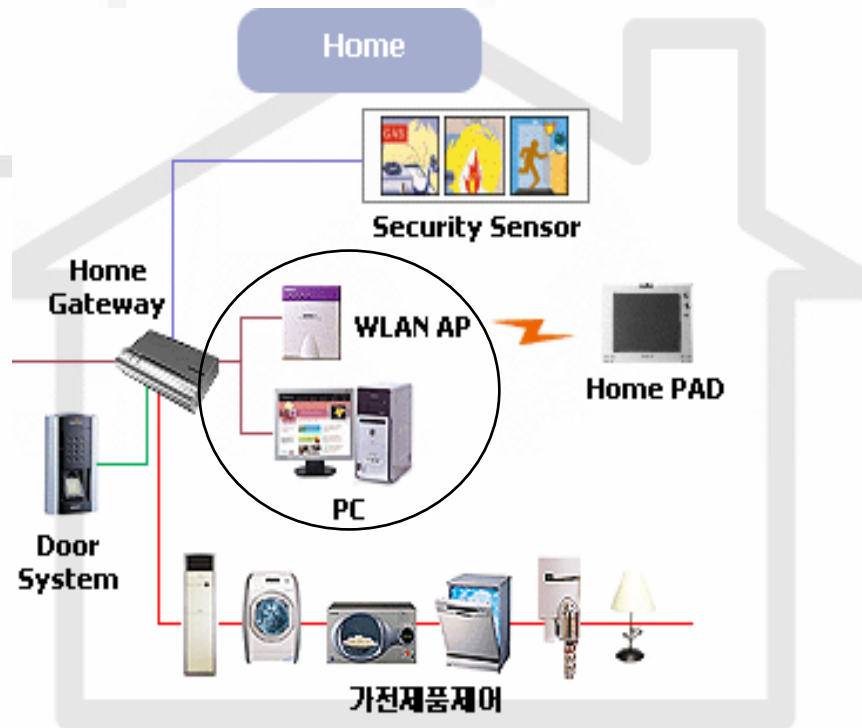System on Chip for Typical Device

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Switched-Leg Operation

- Support for switched-leg circuits is essential for any type of home control application
  - 50% of all homes

- Echelon's power line technology can operate on a switched-leg lighting circuit
  - Low-current node operation, high immunity to noise, amplifier for wide impedance variations
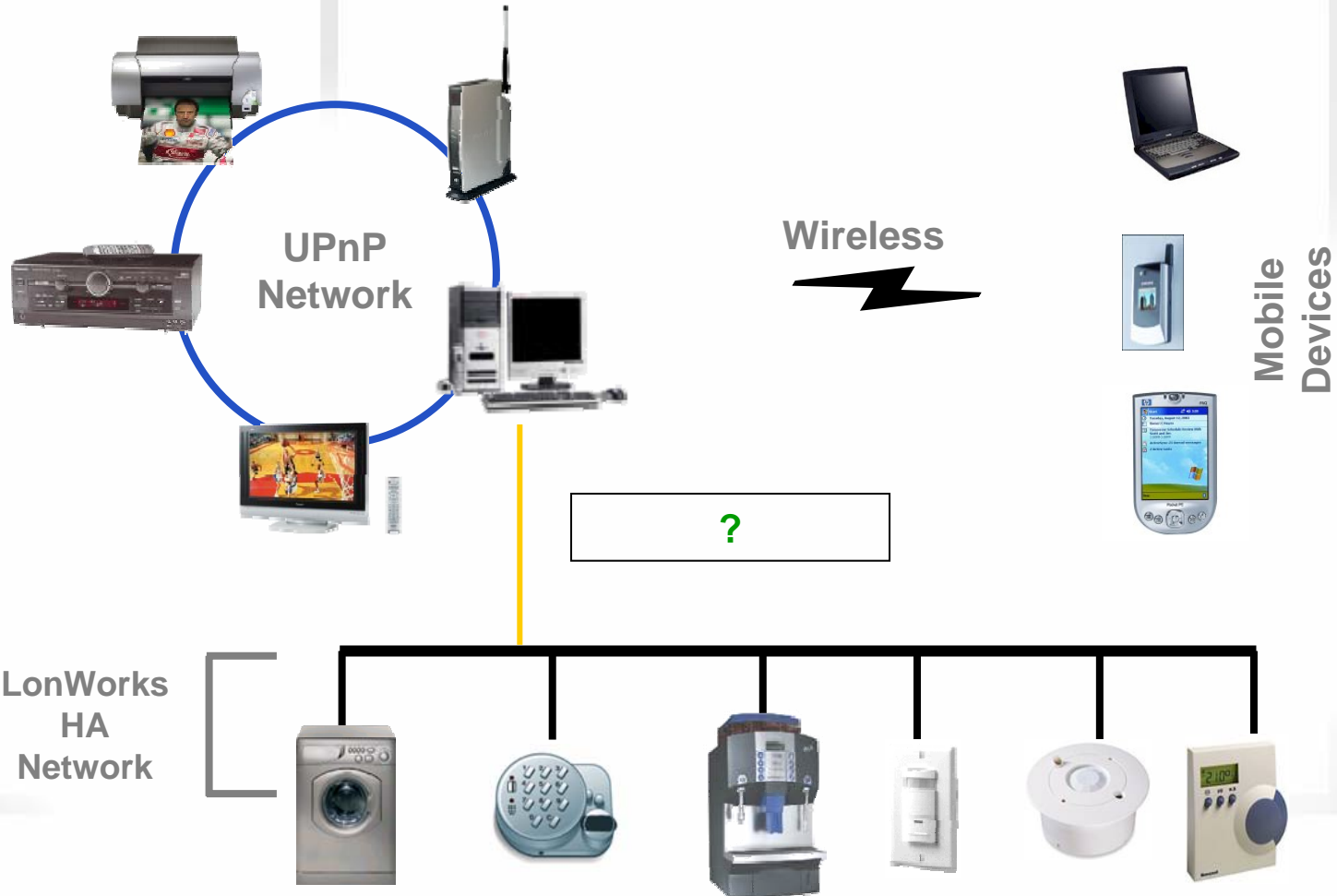 - Fluorescent and incandescent bulbs

Line 1

Neutral

Panel

Ceiling Fixture

"Switched Hot" "Hot"

Wall Switch

OFF

Wall switch has Hot but no Neutral connection

Switched Hot   Hot

PL 31x0 Node

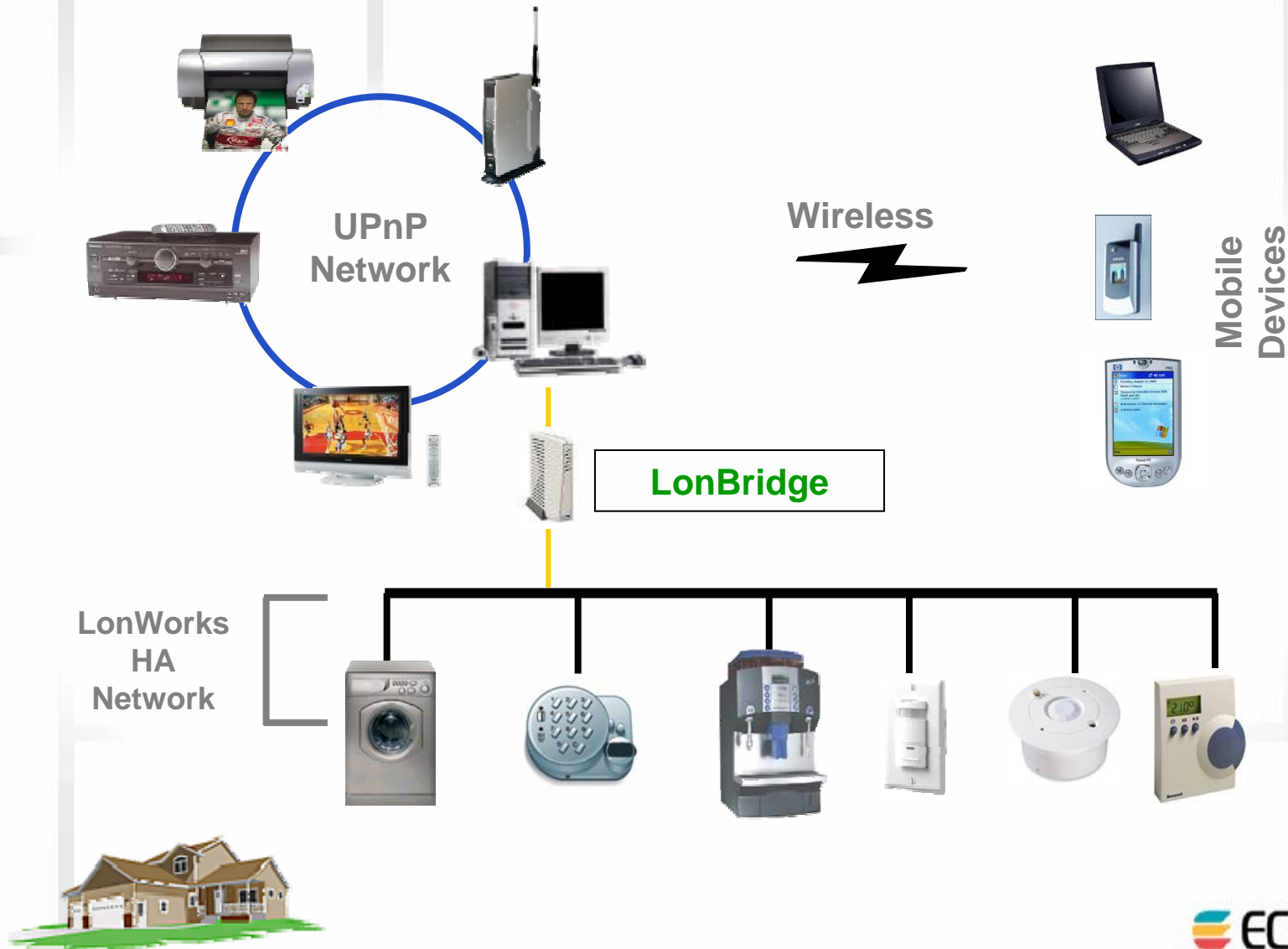ECHELON

Consumer Expectations

- ✓ *Easy configuration* and *installation*

- ✓ *Intuitive* controls

- ✓ *Security* and *reliability*

- ● Seamless *interoperation* and *integration* into data network

Convergence of Control & A/V

UPnP
Network

Wireless

Mobile
Devices

?

LonWorks
HA
Network

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LonBridge for OSGi / UPnP Gateway

UPnP Network

Wireless

Mobile Devices

LonBridge

LonWorks HA Network

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Consumer Expectations

Home

Security Sensor

Home Gateway

WLAN AP

Home PAD

PC

Door System

가전제품제어

- ✓ *Easy configuration* and *installation*

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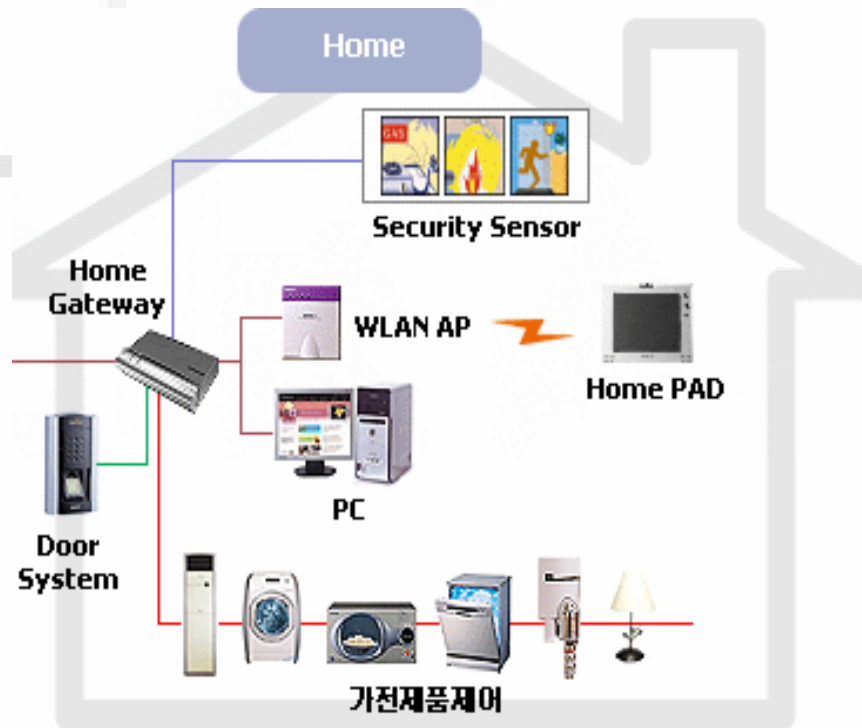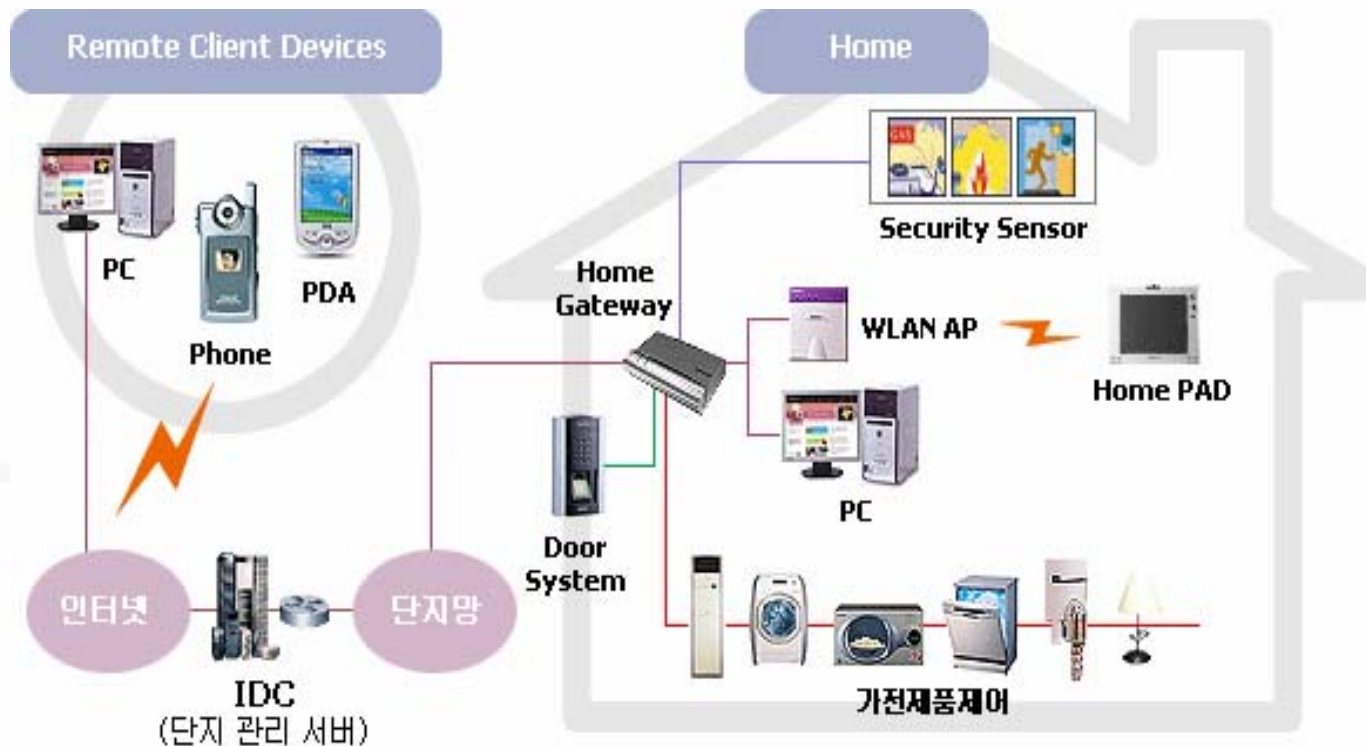- ✓ Seamless *interoperation* and *integration* into data network

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Product Availability

- Samsung HOMEVITA

- Simon

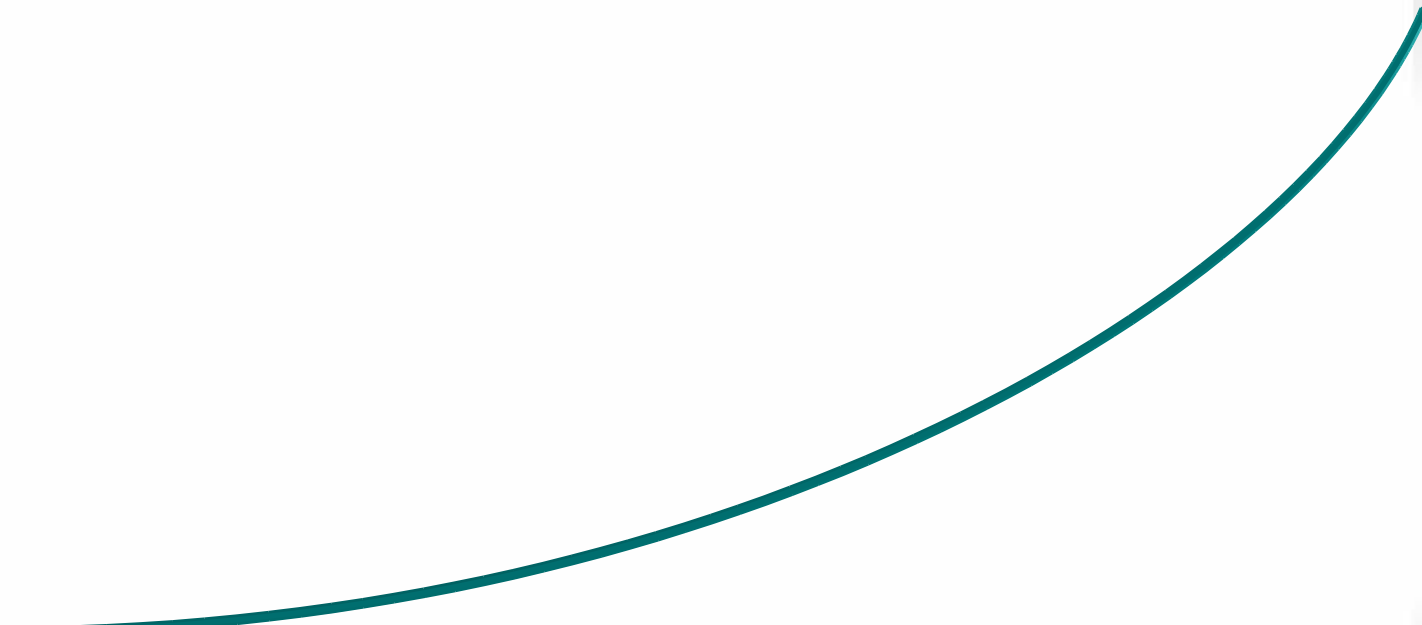- Secyourit SIENNA

- ISDE

- KyungDong

- DongMoon

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So…

size

years

2006 !

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19
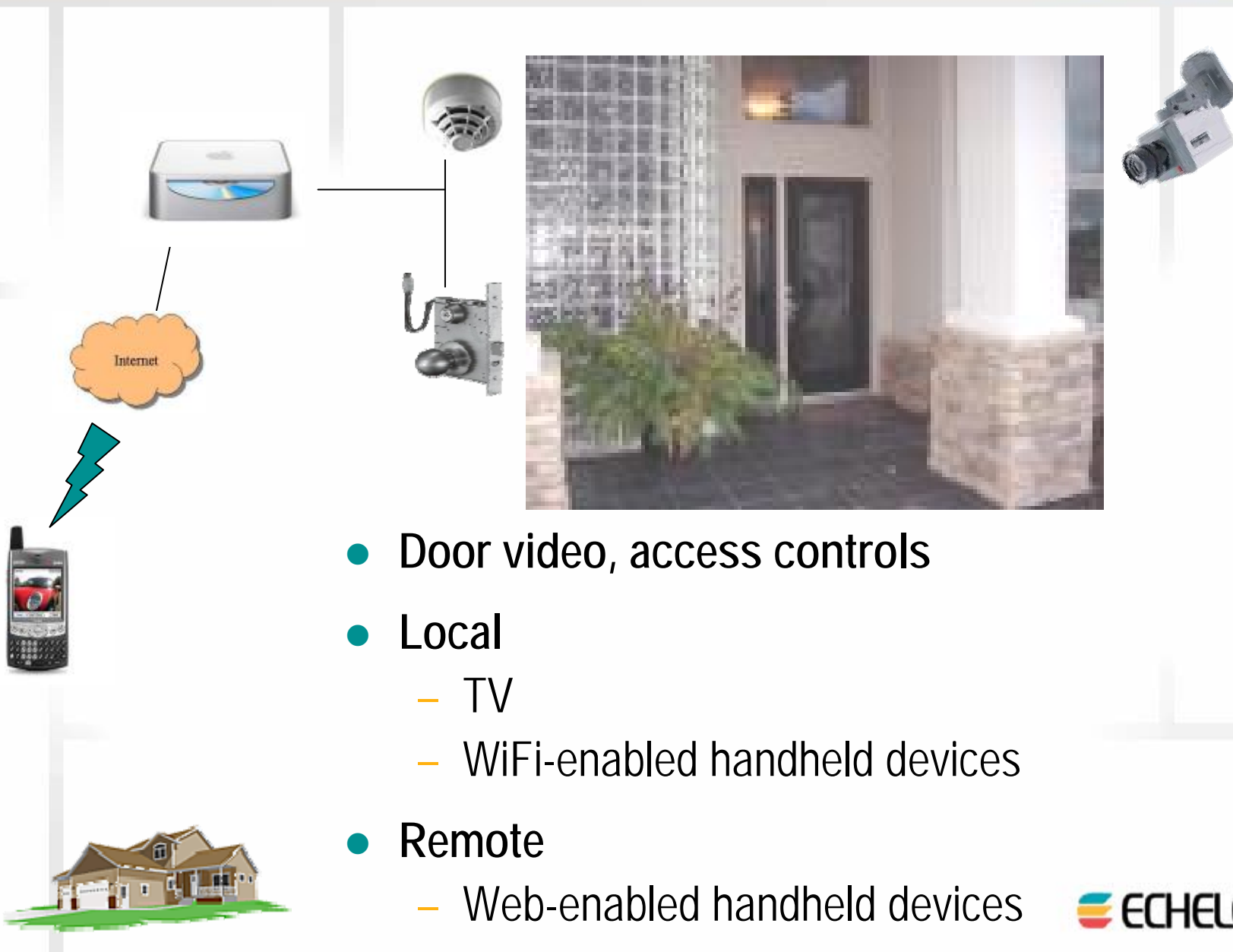
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Thank You

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Scenarios for Enabling Consumer Market

Key Customer Experiences

- **Remote Access & Home Security**
  - Remotely opening of door locks
  - Gas detection notification
  - Motion detection

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Door Access Control & Security – Example

- Door video, access controls

- Local
  - TV
  - WiFi-enabled handheld devices

- Remote
  - Web-enabled handheld devices

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Key Customer Experiences

- **Remote Access & Home Security**
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  - Gas detection notification
  - Motion detection

- **Energy Conservation**
  - Simple method to managing energy usage in a home
    - Thermostat set back, Drying cycles in cloth dryers etc
    - Lighting scene controls

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Energy Conservation – Example

- Consumer configurable – Thermostat setback
- White goods cycle management
- Lighting Scenes

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- **Energy Conservation**
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    - Lighting scene controls

- **Entertainment**
  - Audio/Video integration with lights & blinds, etc.

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Integrated home theatre
and lighting control

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Echelon Digital Home Architecture

- Robust Power Line Technology (silicon chip)

- Lamp module and switched-leg Dimmer (reference design)

- Easy installation with ISI (code library)

- LonBridge™ with device Plug-ins (software)

- Easy and Intuitive user interface (software)

LOW COST
EASY TO USE
INTEGRATED
OPEN

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