

Mesh networks for home entertainment

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This version has been edited for publication as
PDF file at ComNets, RWTH Aachen
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Some animations may not be displayed
correctly in PDF format.

Please see <http://802wirelessworld.com> for
the original version in PowerPoint format.

Consumer electronics (CE)

- Television set
- DVD/CD
 - Player/Recorder
 - Wireless active speakers
 - Surround sound
 - Home Cinema/Theatre
- Remote control
- Game console
- Radio tuner (digital/analog)
- Satellite receiver (digital/analog)
- MP3
 - Computer as source
 - CE device as source
- Wireless phones
 - VoIP

Classification from user view

- Video
 - Video telephony not widely accepted
 - Mainly streaming
 - Mainly non-interactive
 - High Definition TV
- Audio
 - Music/Sound streams
 - Surround
 - Telephony (VoIP)
- Control
 - Channel selection
 - Volume, etc.
- Game console

Video devices

- Video display devices
 - TV set
 - CRT
 - LCD
 - Plasma
 - Video projector
 - LCD
 - LCOS
 - Mounted above head
- Video source devices
 - VCR
 - Camcorder
 - DVD
 - Set top box
 - Satellite receiver
 - Streaming server
 - Video provider

Audio devices

- Simplex source
 - Radio
(satellite/terrestrial)
 - CD/DVD
 - MP3
- Simplex sink
 - Active speakers
 - Headset
- Duplex devices
 - Wireless phone
 - VoIP
 - In house
communication

Game console

- Combines Video and Audio signal
 - Rendered on your PC
 - Displayed somewhere else
 - Surround sound created on PC
 - Sound played back at game console
- Control channel
 - Human Interface Devices (HID)
 - Joystick etc.

Requirements to CE

- Ease of use
 - No user configuration
 - Support well known behavior of CE devices
 - Limit functionality to useful subset
 - No flaws on QoS tolerated
- Competition to existing Audio/Video broadcast systems

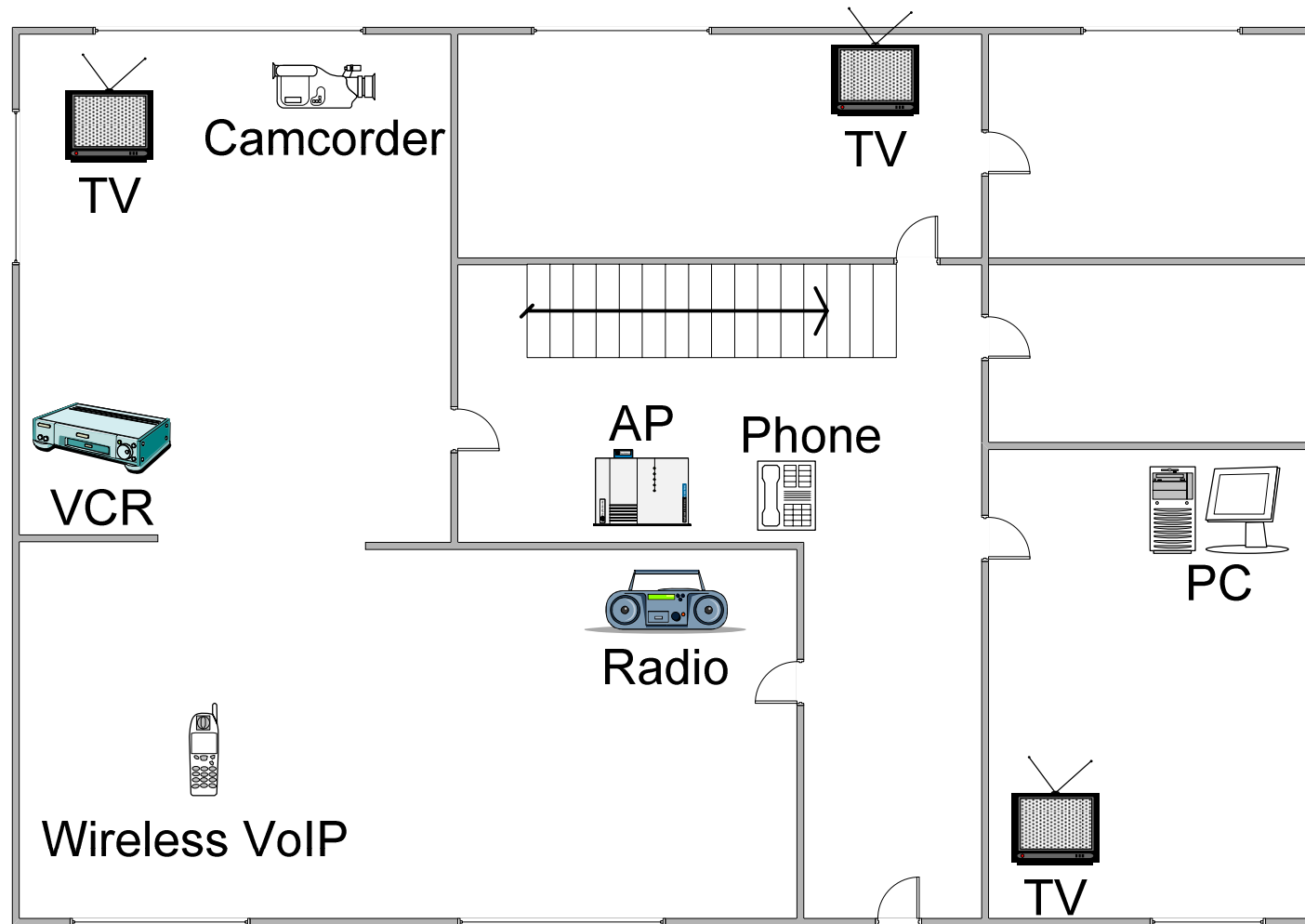
Home environment (1)

- Many stationary devices
- Consumer electronic device always powered
- Few mobile devices
 - Tablet PC
 - PDA
 - VoIP phone
- Slow mobility
- Very slow changing environment

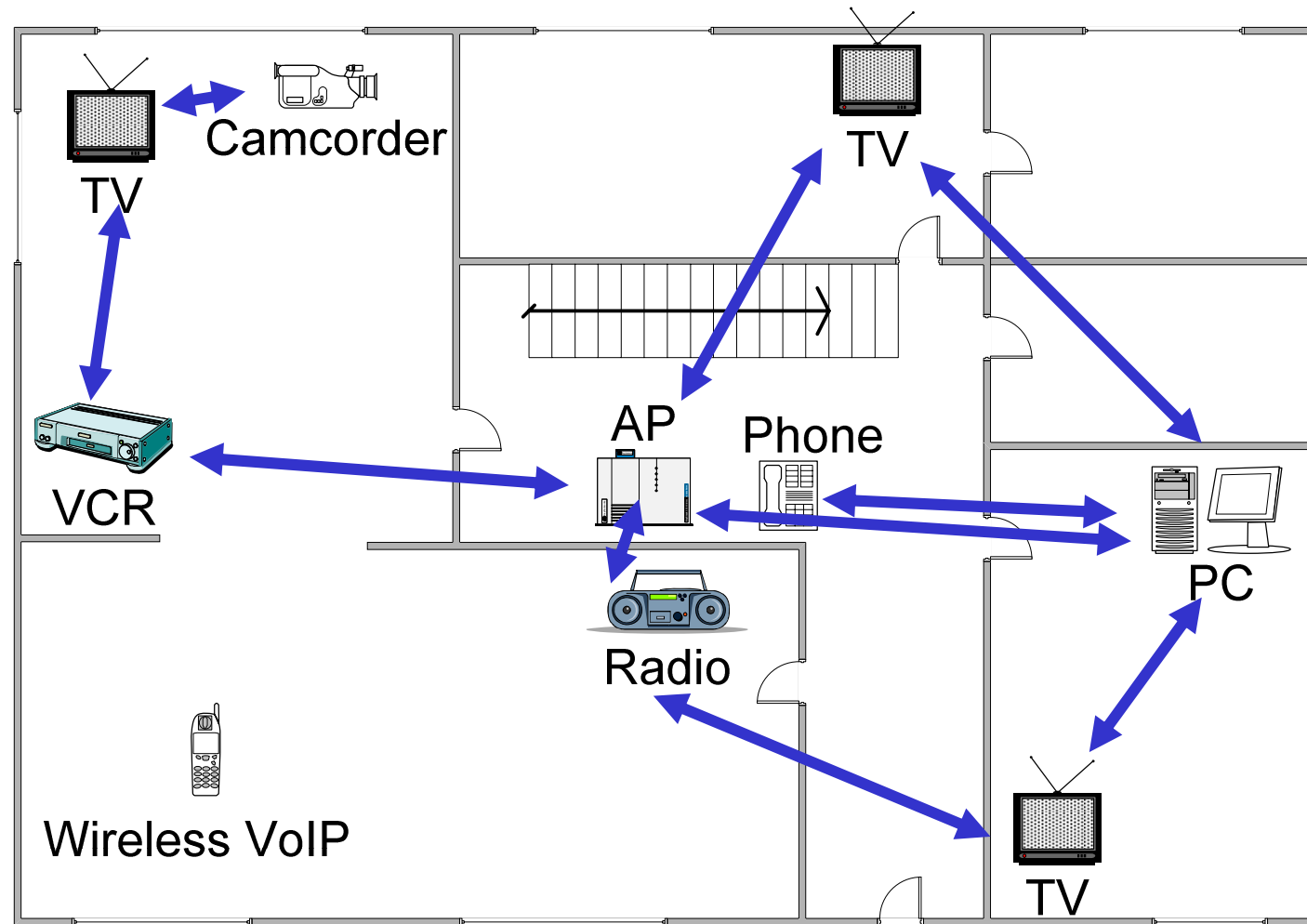
Home environment (2)

- Single household
 - Single Basic Service Set
 - Single administrative instance
- Multiple apartments in shared environment
 - Multiple households
 - Self organizing MAC needed
 - Competition among neighbors on wireless medium

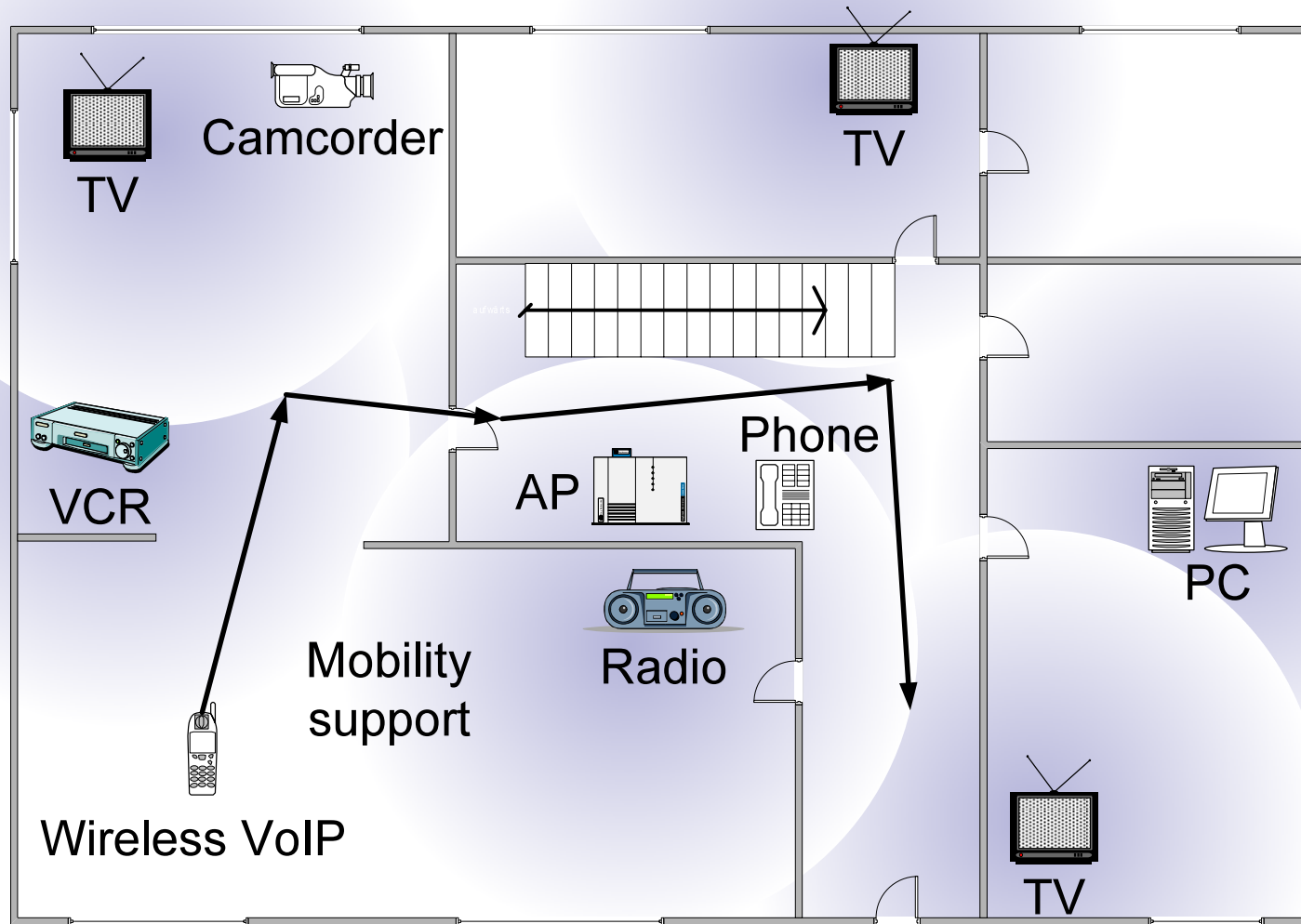
Home environment (3)



Home environment (3)



Mobility



Multi Hop

- Installation of multiple APs not possible
 - Women's acceptance factor
 - Device mesh network
- Attenuation by walls
 - High for 802.11a (5GHz)
- Reduce transmission power to reduce exposition to human beings
 - Multi hop capability needed

CE is sensitive to cost

- Multiple transceiver solutions
 - Frequency diversity
 - Easy spatial frequency reuse
 - May set up separate backbone
 - Parallel transmissions possible
- Single transceiver solutions
 - Cheap
 - Sufficient for average user (?)
 - Avoid unused TRx
 - Easy integration to CE

WPAN 802.15.3

- Various submissions regarding CE
 - Consumer electronic industry requirements for TG3a alt PHY (802.15-03/276r0)
 - Application of mmW-based PHYs (802.15-03/474r2)

Thank you for your
attention

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