802 AVB:
bringing it all together

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Agenda

- What is 802 AVB?
- Why is it needed?
- Where will it be used?
- How does it work?
- Beyond?

What is 802.1 AVB?
(Audio/Video Bridging)

- Simple enhancement to IEEE 802.1 bridges to support streaming services
  - 2 ms guaranteed latency through 8 Ethernet hops
    - longer, but still guaranteed, latency through other network hops
  - Admission controls (reservations) for guaranteed bandwidth
  - Precise timing and synchronization services for timestamps, media coordination, and localization
    - jitter less than 100ns, filterable down to 100ps
    - < 1µs absolute synchronization between devices
    - localization granularity < 10m
- Applies to all networks compatible with IEEE 802 48-bit addressing

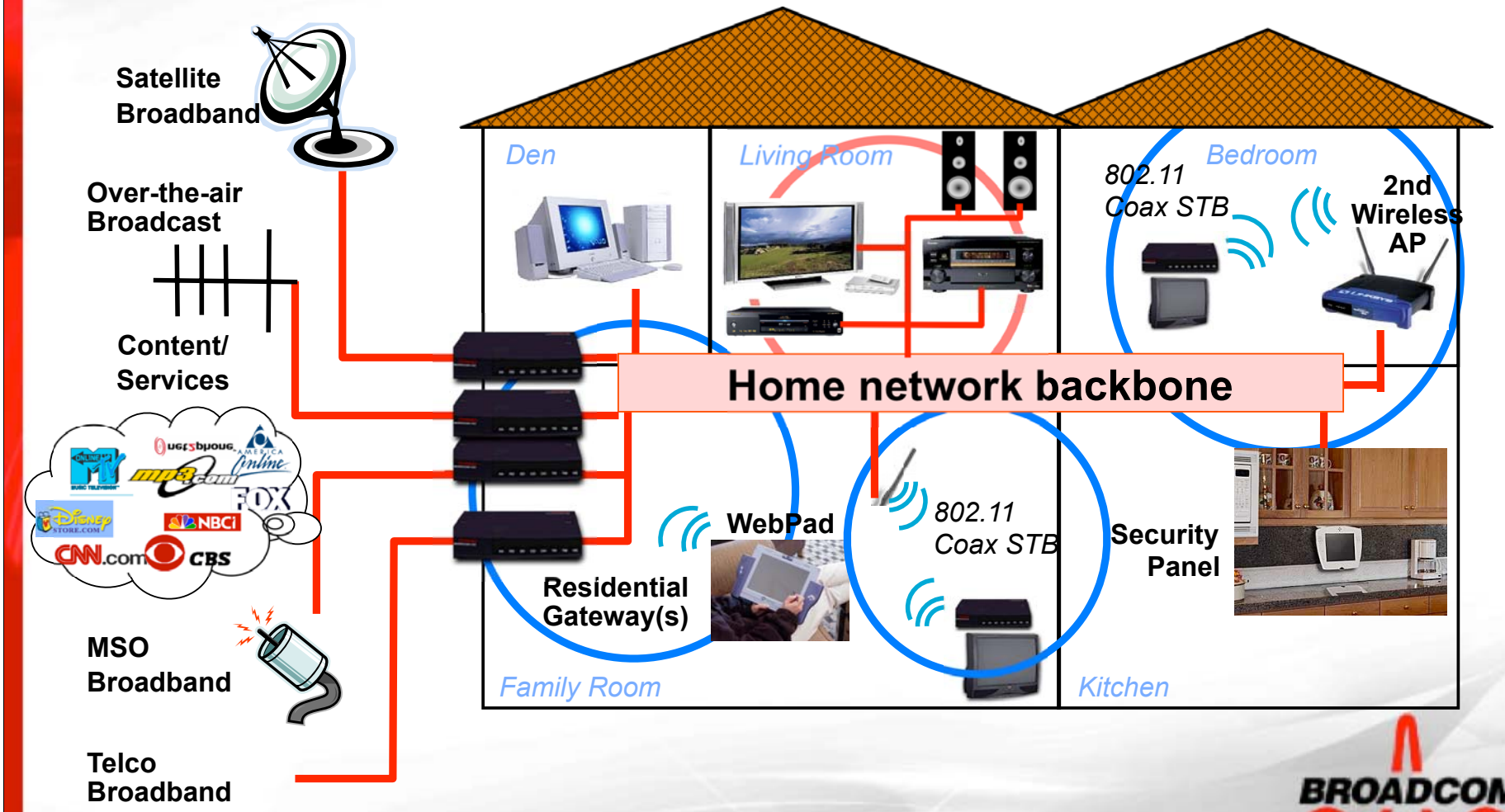
Why is it needed? (1)

- Common IT-oriented networks have inadequate QoS controls
  - All use 802.1 “priority” (actually, “traffic class”)
- Ethernet is the best
  - but it’s easy for the customer to misconfigure or overload
  - no guarantees
- Wireless has inadequate bandwidth and excessive delays for whole-home coverage
  - 802.11n and UWB work for non-critical applications, or short range
  - latencies through multiple A/Ps may be too much for interactive applications
  - no guarantees
  - and we still need a backbone for the wireless attachment points

Why is it needed? (2)

- Proposed CE-based networks need new media or are expensive
  - MoCA requires coax everywhere, and is not cheap, and does not carry power, and has modest performance
    - … but it's part of the solution
  - Power line is not cheap, has modest performance, is susceptible to interference, and is blocked by protection circuits
    - … but it's part of the solution
  - 1394b/c long distance has limited developer base & infrastructure, is not cheap
    - … but even this is part of the solution

Digital Home Media Distribution



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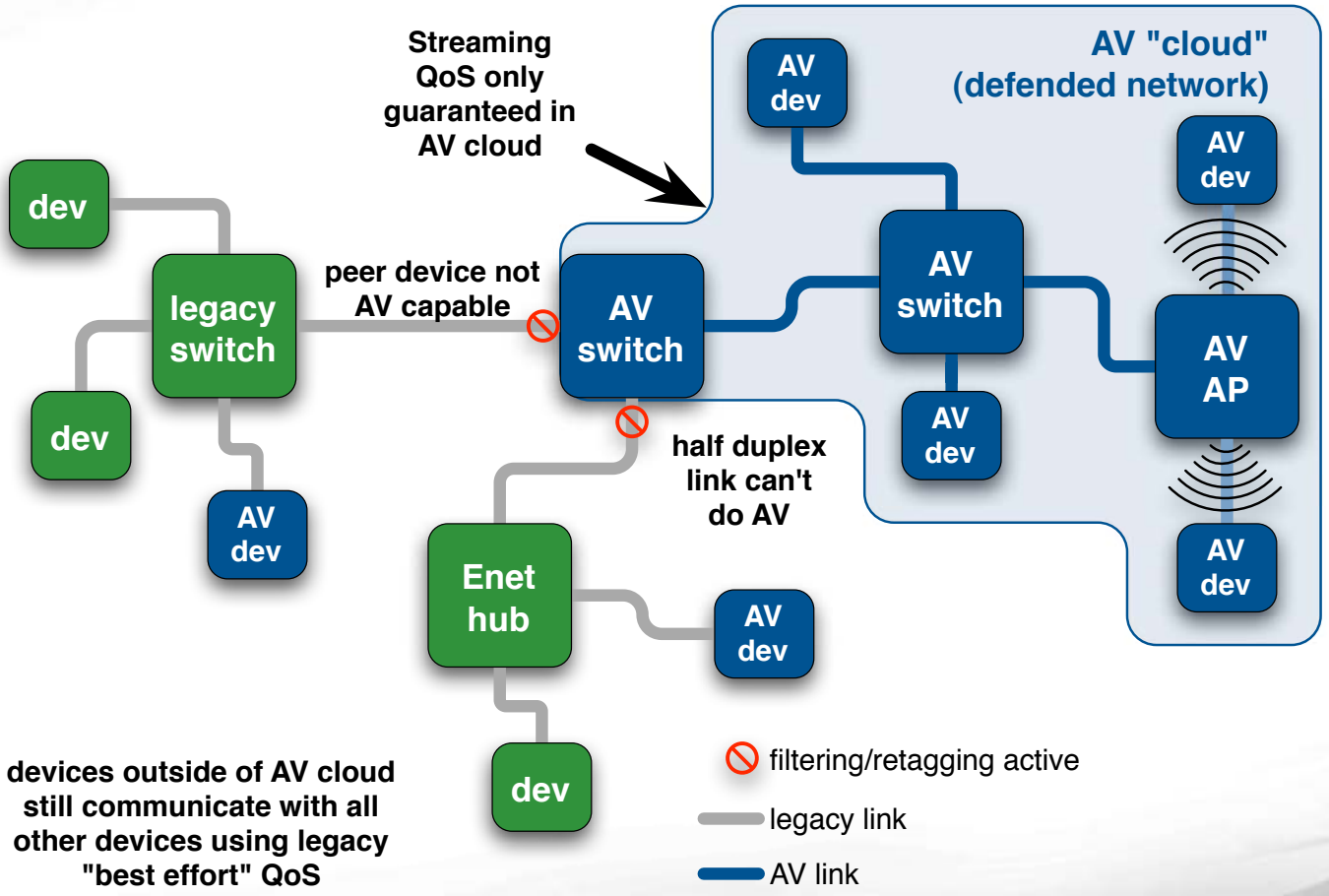
"Ethernet AV": the Gold Standard

- Backbone for home
  - Highest quality/lowest cost way to interconnect wireless A/Ps
  - "Perfect" QoS, requires the least customer interaction
- Within the entertainment cluster
  - Trivial wiring, no configuration, guaranteed 100/1G/2.5G+ per device, not just per room or per house
  - PoE for speakers, extra storage (HD/optical), wireless A/Ps, other lower-power devices
  - Ideal long-term replacement for 1394
- Numerous non-"residential" applications
  - Professional audio/video studios, industrial automation, test and measurement

Wireless and AVB

- Fundamental services are in place for both 802.11 (WiFi) and UWB
  - Rather different model, but compatible
- QoS will not be as good as Ethernet
  - much longer latency
    - but OK for “remote control” responsiveness
  - much less bandwidth
    - but OK for limited channels
  - and very, very useful for a huge number of applications
    - mobile and “no new wires”

Topology & connectivity



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When?

- IEEE standardization process started
  - IEEE 802.1 created “Audio/Video Bridging Task Group” in November 2005
  - Ethernet version: technical closure in 2006, final standard in 2007
  - WiFi version: technical closure in 2007, final standard in 2008
- First hardware/software soon after stablilization
  - Possibly a number of “pre standard” implementations
- Later editions support uncompressed HD video
  - “multiGigabit” NIC/Switch (“Ethernet HD”)

Summary

- Ethernet AV will be the standard interconnect for uncompromised quality of service
  - soon!
- Wireless 802.11 AV shortly after that for “no new wires” and mobile applications
- Bridging to other nets is likely
  - 1394 and MoCA bridging rather straight-foward

Thank you

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