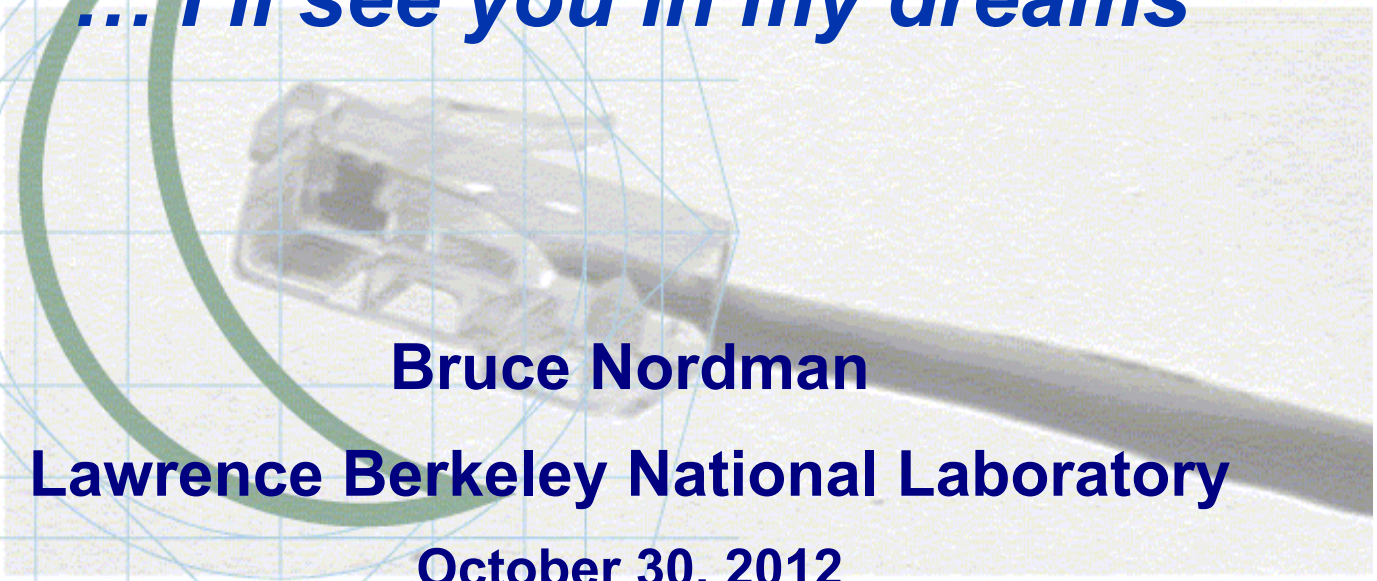
CalPlug STB Workshop

"… I'll see you in my dreams"



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Context

- This talk about local A/V network
  - Not service provider communications

- STB is a standard actor in local network

- This talk about all local A/V devices
  - Information visible externally
  - Not internal technology

Some needed technology

- Three-state power model
- Expose power states
  - In user interface and (local) network
- Ensure “full network connectivity” in sleep
- Ensure sleep modes are automatic and convenient
  - Needs new* protocols, behavior, expectations
  - Needs new concepts

**or adaptations of existing protocols*

3-state power model

- Two basic states is too few
- Middle state is “sleep”
- Need Off even if not commonly used
- Four basic states too many (not needed)

- May elaborate within a basic state
  - “light sleep”, “deep sleep” – “active”, “idle”
- “Standby” not a suitable term

Expose states to user and network

- Communicate to user
  - Standard UI elements (IEEE 1621)
    - Terms, symbols, colors, metaphors, associations
- Communicate to network
  - Device power state and/or state transitions
  - Entangled with device discovery / service discovery
    - Need to adapt these mechanisms

“Full Network Connectivity”

- Term from Energy Star for “Network Proxying”
- “***…. I’ll see you in my dreams***”
  - **awareness of network (even if limited) during sleep**
- Presence needed for …
  - existence at all
  - device / service discovery
  - applications
- Hide sleep status from network
  - When network doesn’t know about sleep states
- (HDMI enables most of this today)

New protocols in local network

- Includes adaptations of existing protocols
  - HDMI, IP-based discovery and content streaming

"Wake up when need to; go to sleep when can"

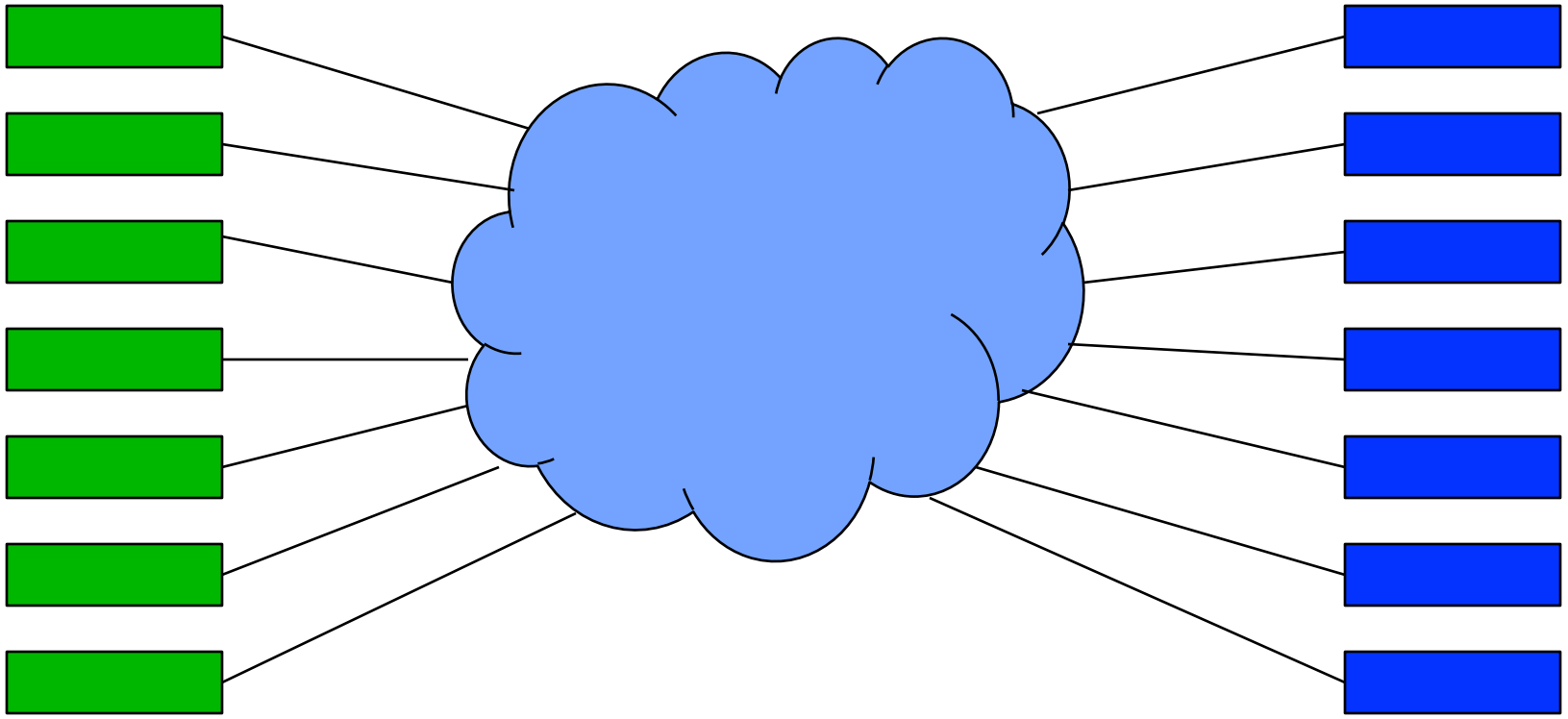
- Generic architecture that can be implemented in each specific protocol
- Need to anticipate emerging complexities
- Proposed concept
  - A/V content streams can be **asleep** — not just **active** or **terminated**

Future local A/V network

(A/V network subset of IP network)

Source devices

Sink devices



Content

Local, Internet, Service Provider

Senses

Audio, Video, Both

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(A/V network subset of IP network)

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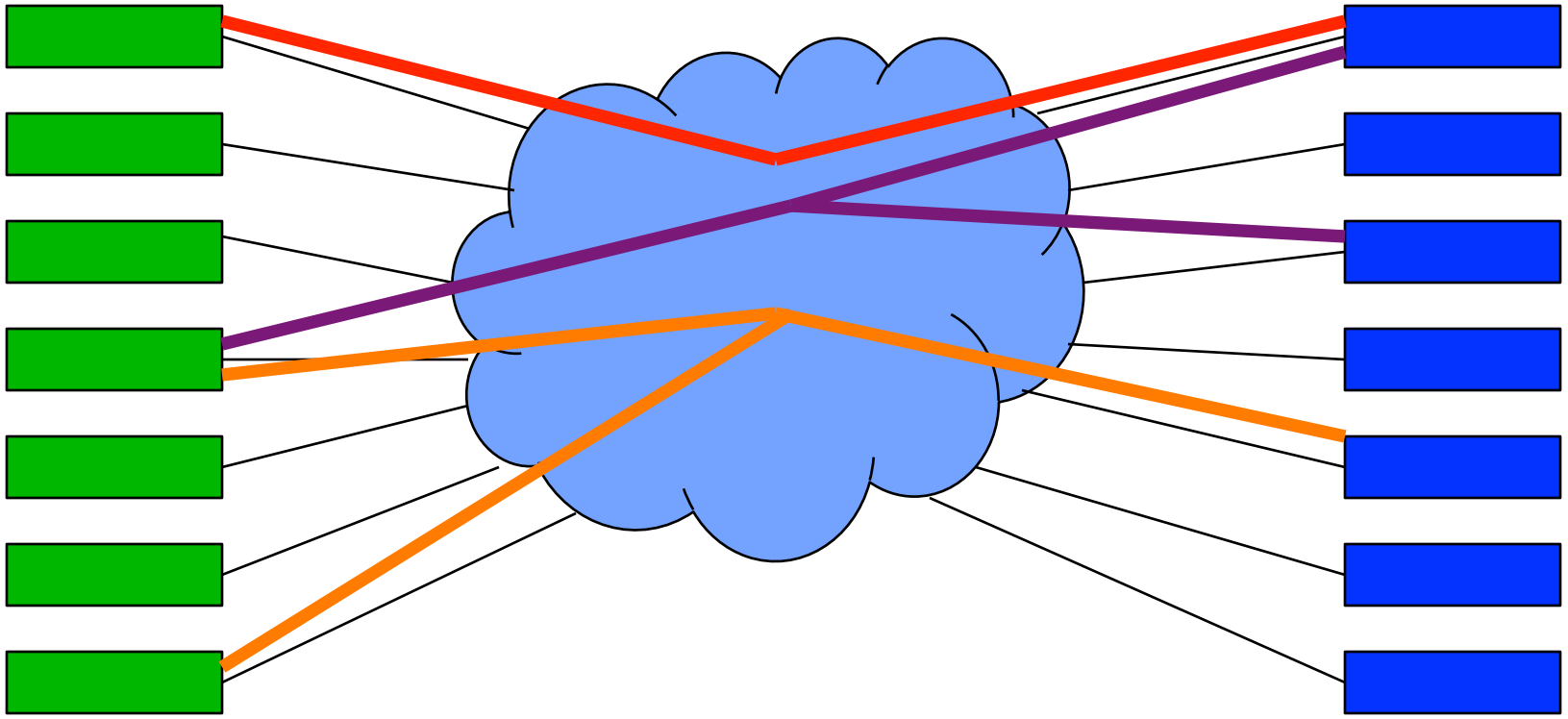

Content

Local, Internet

Senses

Audio, Video, Both

Future content stream features

- Multiple streams happen simultaneously
- Streams come, go autonomously
- Devices involved in >1 stream at a time
- Streams transit >1 link technologies (IP and not)

- Need to manage “authority” to wake a device
- Need standard expectations for behavior
  - Device/device, device/human, human/device

- “Sleeping streams” may be key
- Basic concept does not define/restrict entire solution

Summary

- Sleep as the normal low-power mode
  - How we get energy savings
- Sell new capabilities on convenience – energy savings a nice side benefit
  - To users, manufacturers
- Need solutions for all digital communications technologies
  - Universal

Thank you