

# “Pro” Audio and Music: Implications for Home Networks

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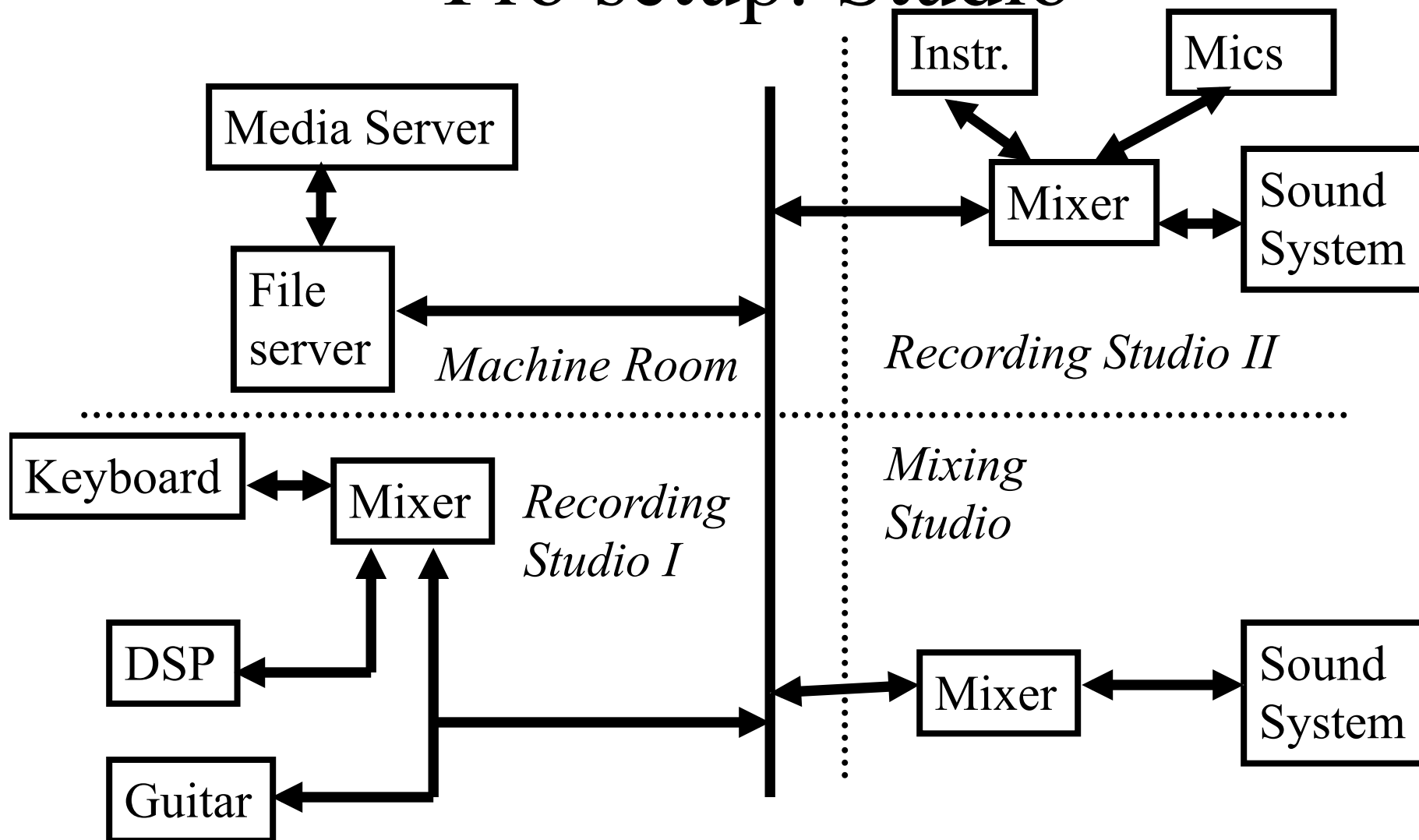
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# Outline

- What is Pro? What is consumer?
- “Pro” standards activities
- My vision: four scenarios

# Pro setup: Studio



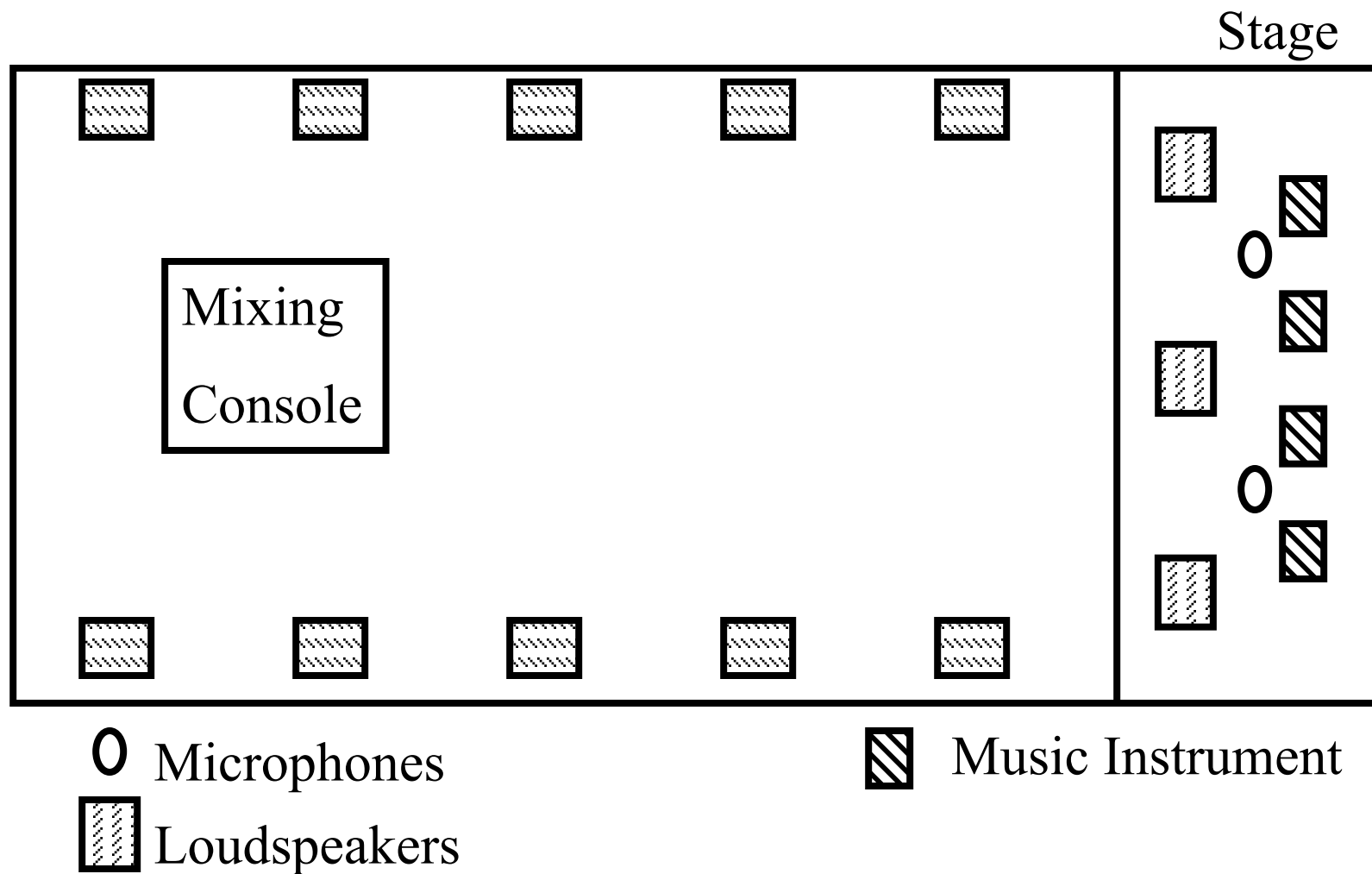
# Pro: Studio



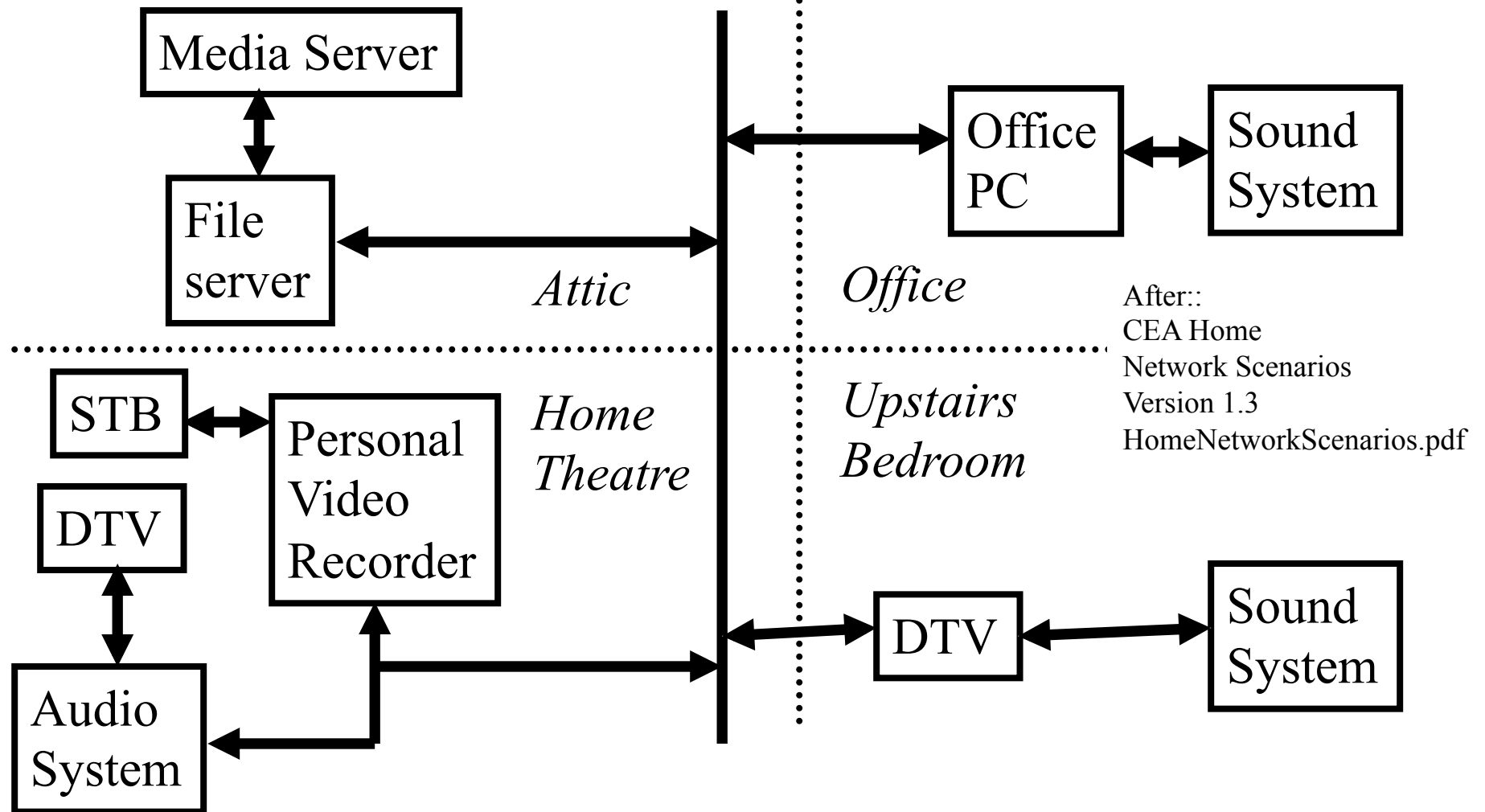
# Pro: Venue



# Pro: Venue



# Home setup: less complex?



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# Audio Engineering Society

- SC-02: Subcommittee on Digital Audio
- SC-06: Subcommittee on Network and File Transfer of Audio
  - SC-06-02 Working Group: Audio over 1394
- [www.aes.org](http://www.aes.org)

# AES Standards

- AES3-1999: Serial transmission format for two-channel linearly represented digital audio data
- AES11-1997: Synchronization of digital audio equipment in studio operations
- AES47-2002: Digital audio over ATM

# SMPTE

- SMPTE 320M-1999 Television - Channel Assignments and Levels on Multichannel Audio Media
- SMPTE 323M-1999 Motion-Picture Film - Channel Assignments and Levels on Multichannel Audio Media

# MIDI

- MIDI Manufacturers Association (MMA)
- RP-027

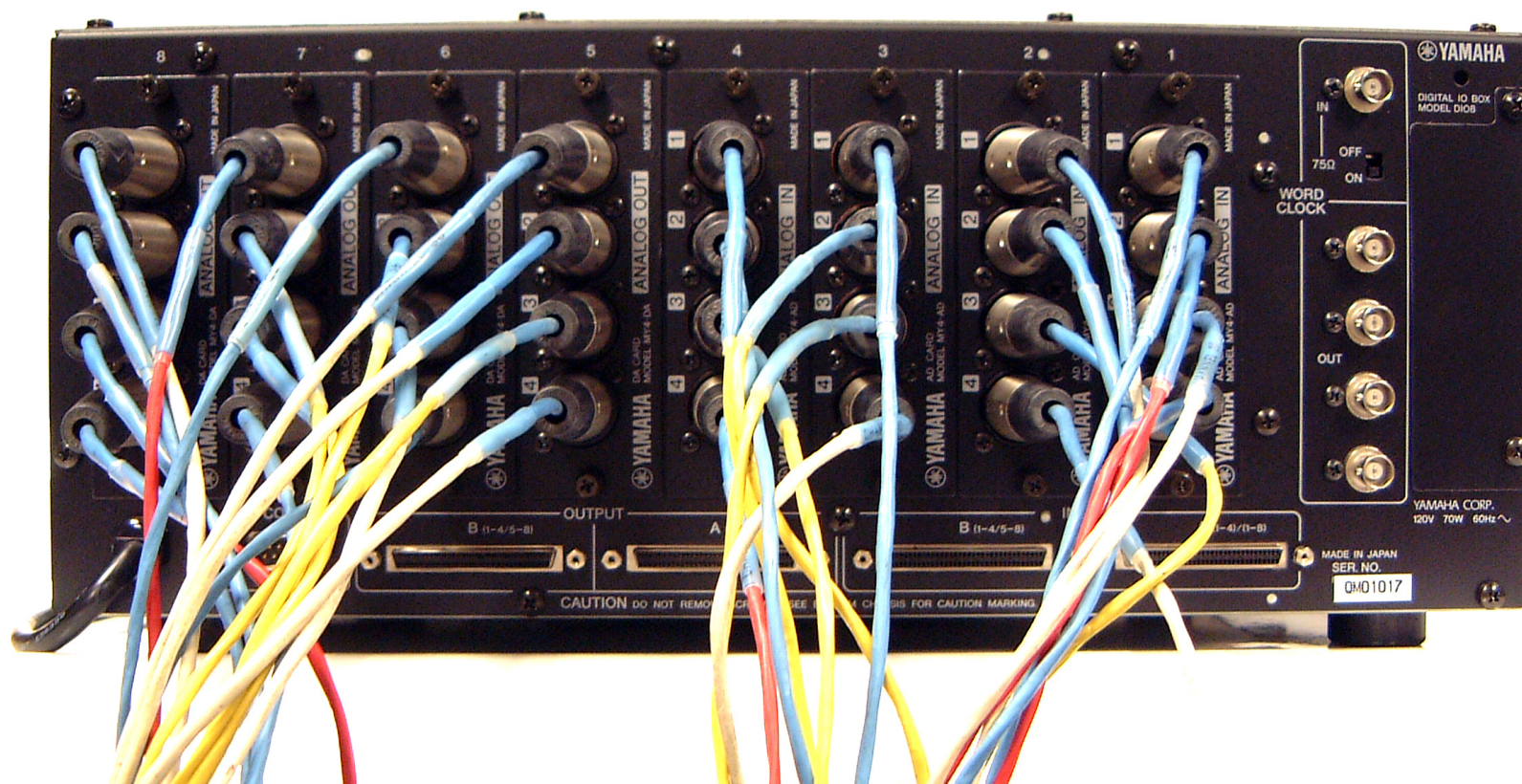
# Outline

- What is Pro? What is consumer?
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  - Interaction, Management, Control
  - Remote interaction
  - Creativity
  - Extensibility

## Scenario I: Interaction

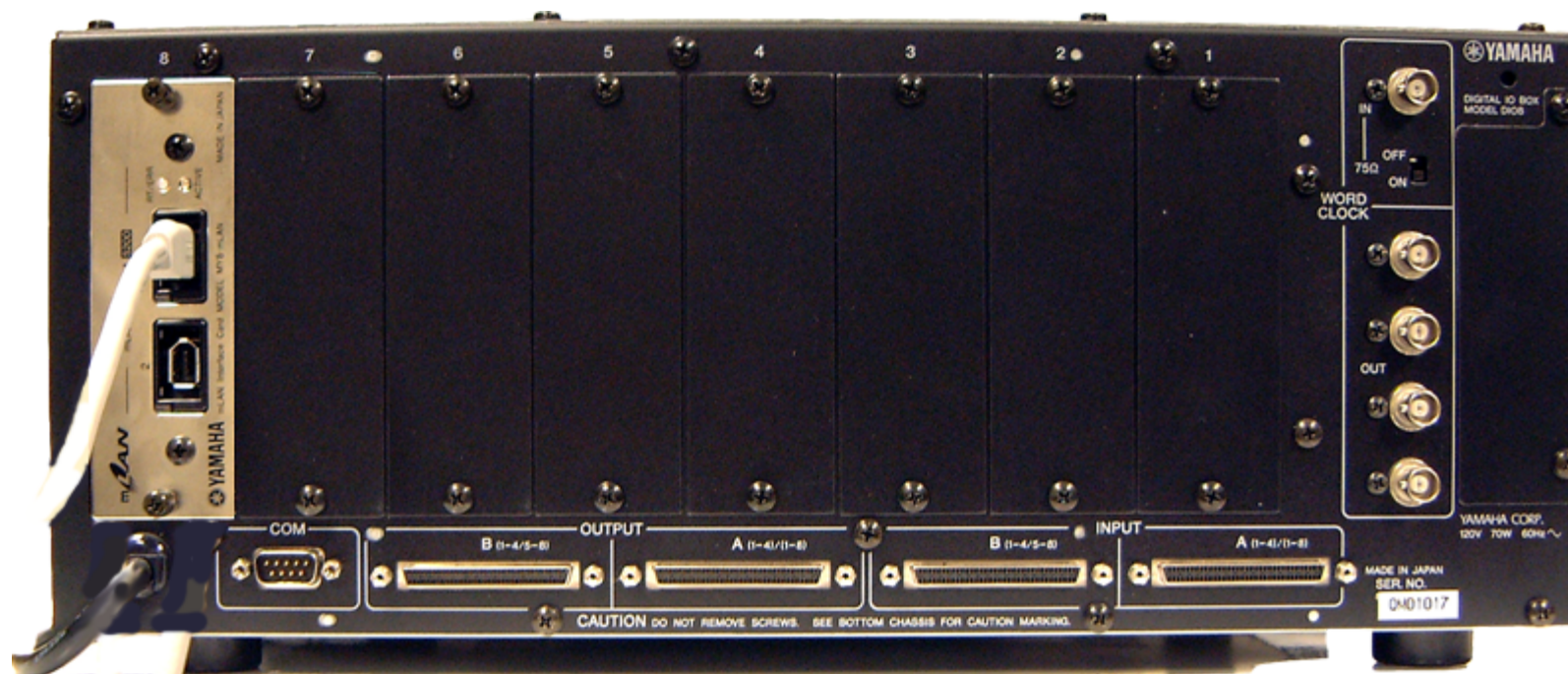
Ethan and Andy are making music in the family room, Tuesday night. Both are plugged in to the house's 1394 bus. Joe comes over to join them, arriving late. He plugs in his guitar and his effects box. Ethan also starts to play his guitar through Joe's effects box. Meanwhile Ethan's wife is in her office listening to stock reports over internet radio, piped to her office over the same 1394 bus.

# Connections (1)



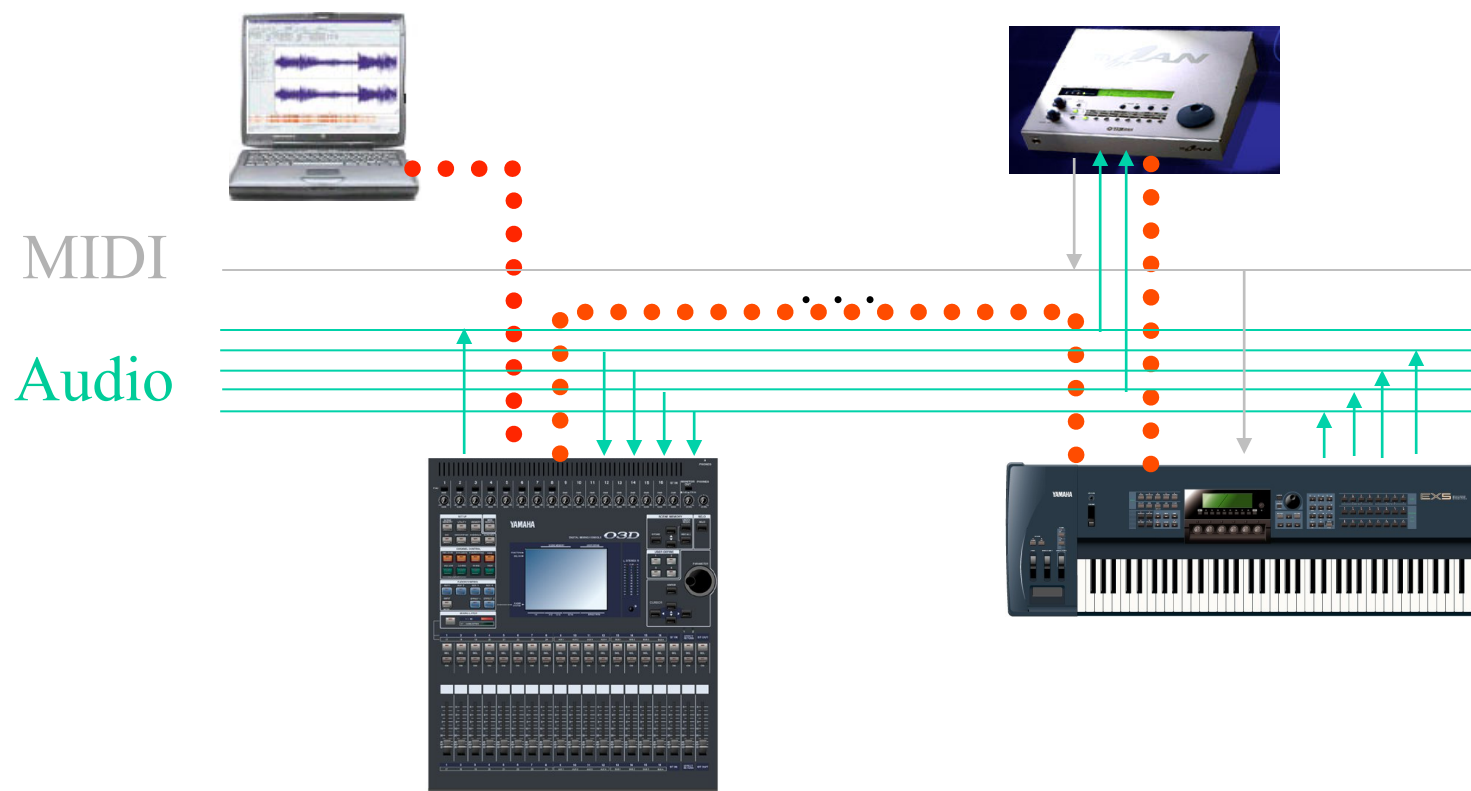


# Connections (2)

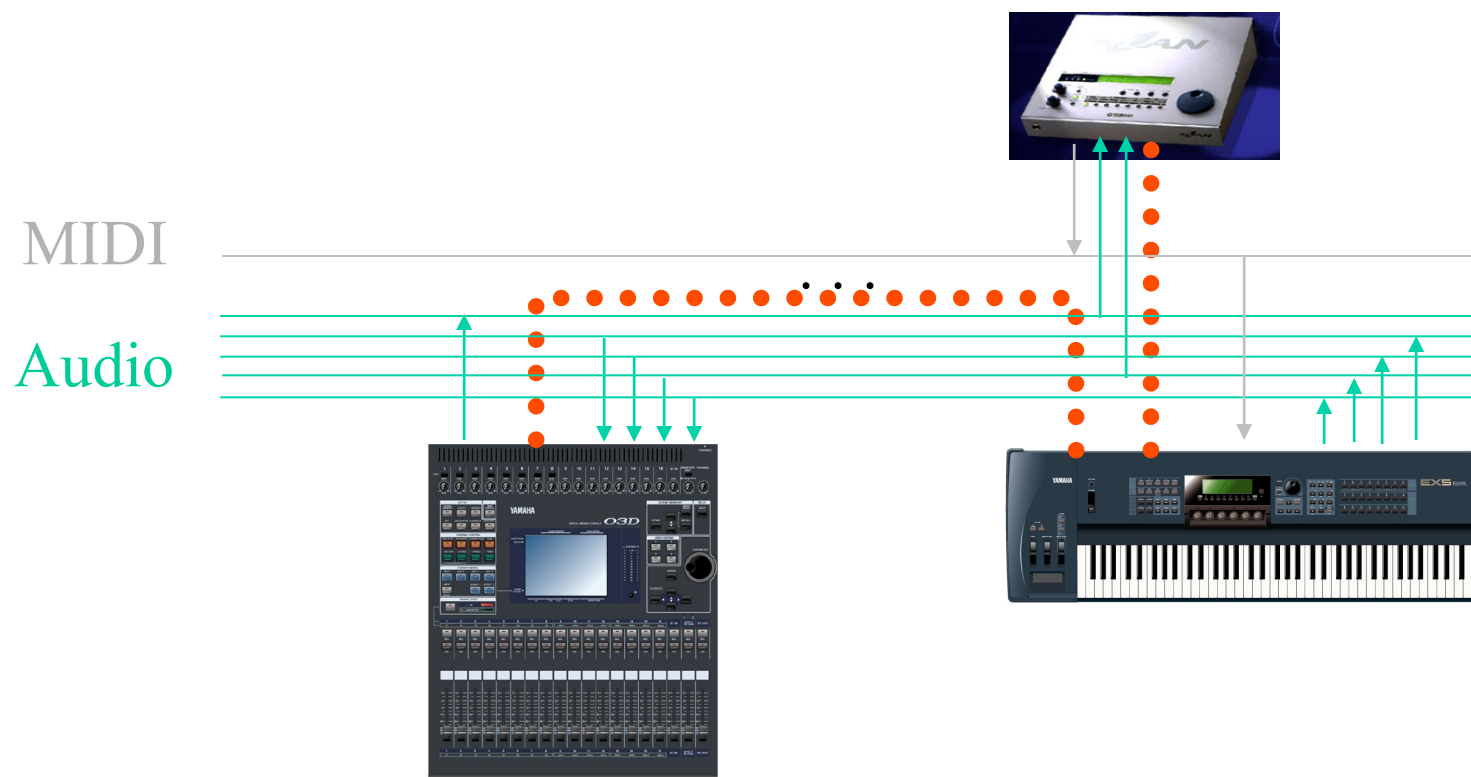




# Connection Management - in rehearsal studio -



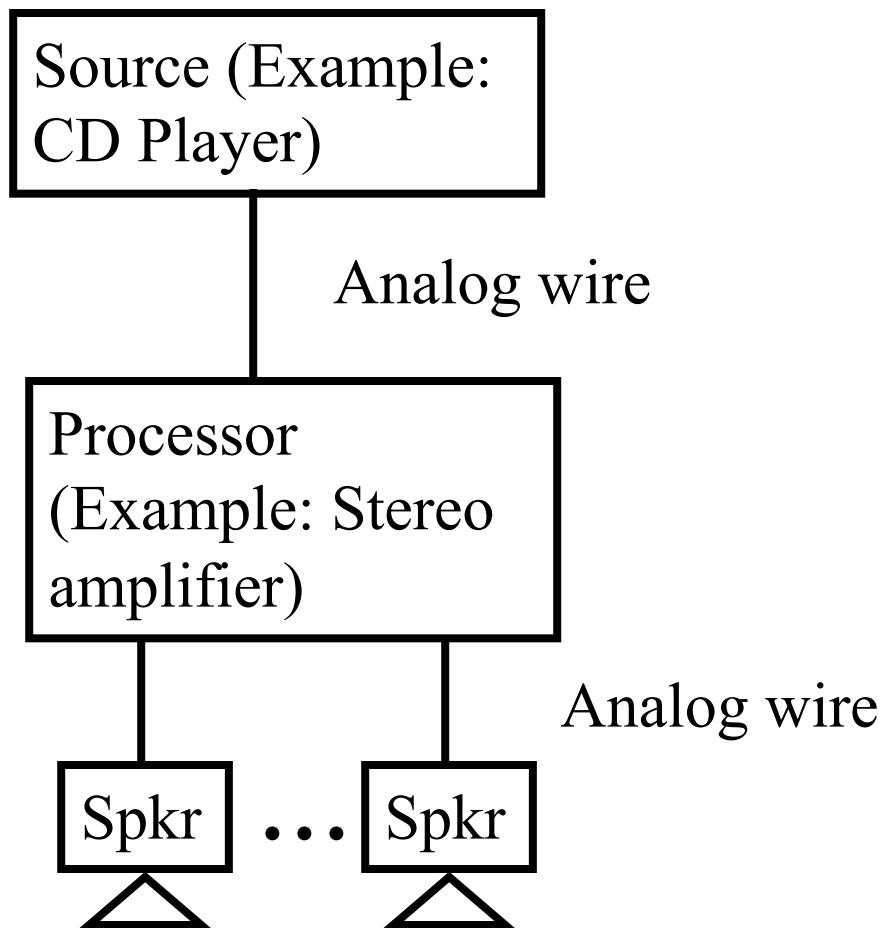
# Connection Management - on stage -



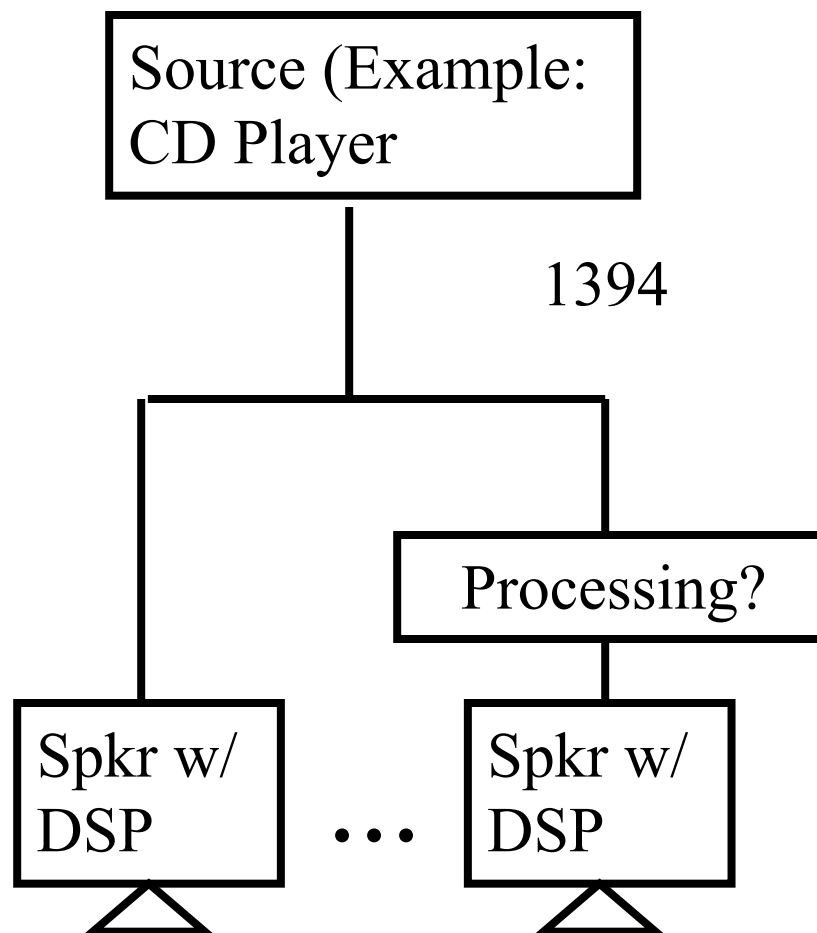
# Control

- AES-24
- AV/C
- uPnP
- XML
- MIDI, Midi Show Control, Sys Ex, ...
- Proprietary (RS-242 ...)
- ...

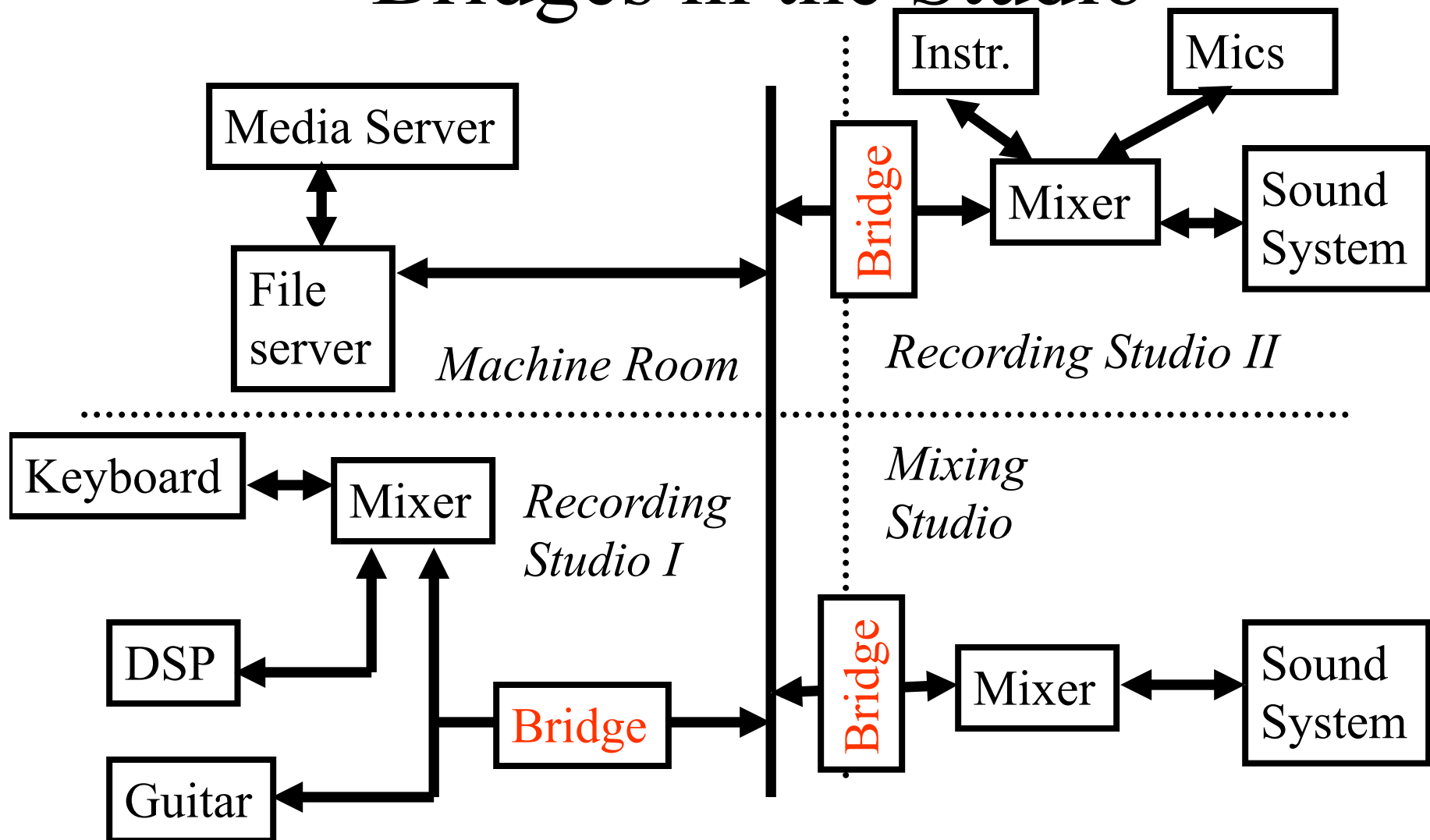
# Sync: Traditional “home”



# Sync: Distributed processing



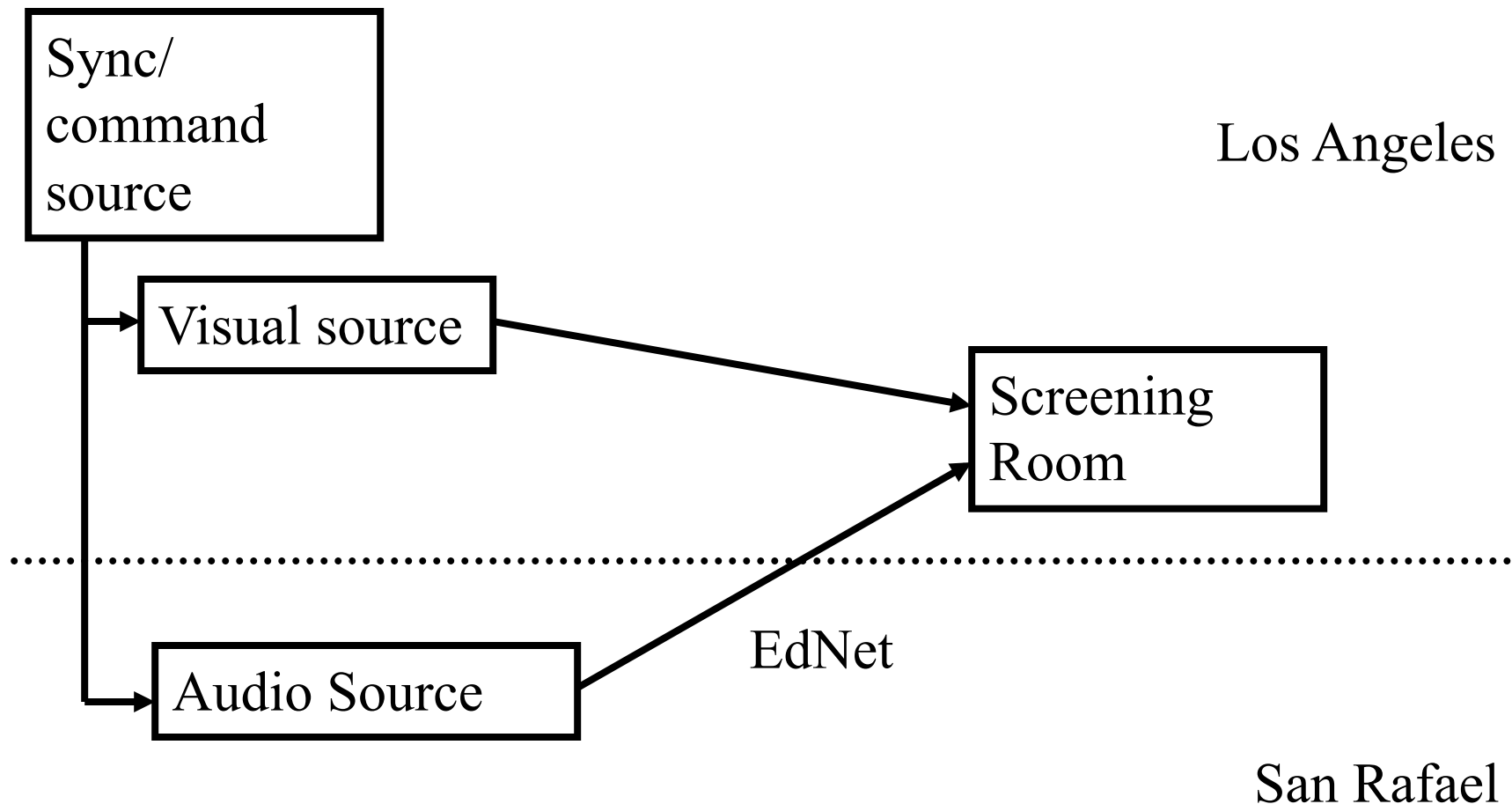
# Bridges in the Studio



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# “Pro”: remote audio





## Scenario 2: Remote

Lateesha is confined more or less to her room in a rest home. But that doesn't keep her from making music with her friends. Three of her friends get together in one home about twice a week. Lateesha dials in with a MIDI silent drum set, using the voice-activated user interface, since she sees poorly and can't use a GUI. Back in the house where the group is, Lateesha's signal comes in loud and clear. Meanwhile, a group mix is sent back to Lateesha so that she can see how she fits into the ensemble. She adjusts the brightness control on her voice because in her monitor mix, she sounds too bright. She also adjusts the stereo pan because she doesn't hear well out of the left ear, and the stereo image is all jumbled into her right side.

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## Scenario 3: Creativity

Linda, her husband, and her two children have all made videos during the past year. Now it's time to make a CD-ROM for Christmas for the grandparents, who live on the opposite coast. Linda works at her computer with non-destructive video/audio editing software. She pulls in video clips from her son's computer, and her husband's. She uses her daughter's synthesizer to generate sound, which is triggered via MIDI from Linda's computer. Linda records a voice-over + cues it up. When it's all ready, her husband pulls up the final session from his office in the basement and watches it there, pulling in video and audio sources from all over the house.

# Creativity



# Creativity: DRM

- Music as “service,” not “product”
- Level of audio quality vs. cost?
- “Video rent” -> “audio rent”?
- “network” support DRM and shifted economic model.
- DRM can't get in the way of creativity.

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## Scenario 4: Exensibility

Mitsuko and Gerard move to a new town. She gets involved in local politics, meets some people who like to make music together. She takes her Yamaha synth over to their house to see if they can make music together. Is it an mLAN synth, a digital synth with AES/EBU outputs, an old analog synth with analog outputs? How can she plug in to their in-house network?

# Legacy consumer

- Record player
- Tape recorder
- Music instrument
- Video recorder
- XBox, Playstation, ...



# Apogee AD8000

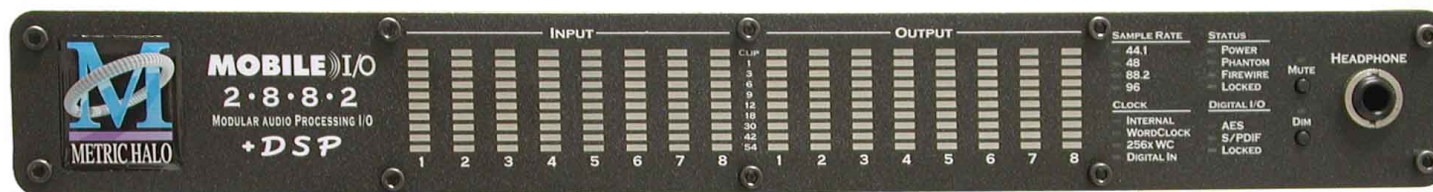


*Front Panel*



*Rear Panel*

# Nonstandard: is it 61883-6?



# Extensibility: The Next Generation



# Outline

- What is Pro? What is consumer?
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- Summary

# Implications of Pro for Consumer

- No definite distinction: consumer gear faces pro issues.
- Many audio sources, destinations
- Many channels of audio
- Different kinds of gear



# Implications of Pro for Consumer

- Formats: 61883-x (A/M) adequate for pro, consumer
- AV/C questionable for pro, maybe consumer.
- Connection management needs “sticky”.

# Implications of Pro for Consumer

- Copy protection will trip up pro work, irritate consumer, network will be blamed.
- Bridging helpful to isolate bus (e.g. reset)
  - but need bridge-aware devices.
- How to maintain sync in a complicated consumer setup.
  - Not all sources will be on 1 CD.

# The Home Network Should:

- Encourage interaction, locally & remotely.
- Be easy to manage and control.
- Encourage creativity.
- Embrace the unexpected.