Revealing the Truth by Measuring Multimedia Delay
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Nordunet 2018, September 18
Digitalization Leads to Delay

• Delay contributors in multimedia pipelines
  - The old analogue world (1960s - 1980s): *Speed-of-light*
  - The digitized world (1990s – present )
    • Video frame buffers in camera
    • Audio sample buffers in sound cards, production tools
    • Encoding / compression algorithms
    • Network interface transmission buffers
    • Router buffers
    • *Fiber length ~ Speed-of-light*
    • Decoding / decompression buffers
    • Video projector / display frame buffers
    • Audio playout buffers
True end-to-end measurements

- "Ping" is only the network
  - Routers and fibers are fast
  - Cameras and audio cards buffer more
  - Codecs love buffering
- Lens-to-screen or mic-to-speaker measurements required
- https://delay.uninett.no
From Analouge to IoT Measurements device

- **Manual read-off from oscilloscope**
  - Time consuming
  - Even more time consuming if accuracy is to be in ms range

- **Manual input to database**

- **Auto read-off**
  - Arduino Yun v2
  - Measures in ms range

- **Auto upload to database**
  - Eduroam via certificate
  - Works offline, uploads when online
More Truth...
The Truth...

Select tests to compare:
- Video, HD camera and Flycap2 with 162fps
- Video, HD camera and LOLA Pointgrey with 120fps
- Video, Toshiba DVI camera 1080i50
- Video, Toshiba DVI camera 1080i59.94
- Video, Toshiba DVI camera 1080p50
- Video, Toshiba DVI camera 1080p59.94
- Video, Toshiba VGA camera 640p60
- Video, VGA camera and LOLA bitflow with 60fps

[Select options: Select all, Clear all, Search camera, Averages, All samples]
And more...

Select tests to compare:
- Audio, Headset test, Apple airpod, OSX
- Audio, Headset test, Logitech ClearChat Comfort
- Audio, Headset test, Logitech Cordless
- Audio, Headset test, Logitech PC Headset
- Audio, Headset test, Plantronics Audio
- Audio, Headset test, Sennheiser PC 363D
- Audio, Headset test, Sennheiser PC 363D USB

Search: headset

Averages □ All samples