

# The Proximal Workspace Architecture: A Latency- focused Approach to Supporting Context-Aware Applications

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- **Background and Motivation**
  - Small Devices
  - Big Applications
  - Thin Clients
- System Architecture
- Adaptation of Google Earth
- Next Steps

# Small Devices



Zypad Wearable



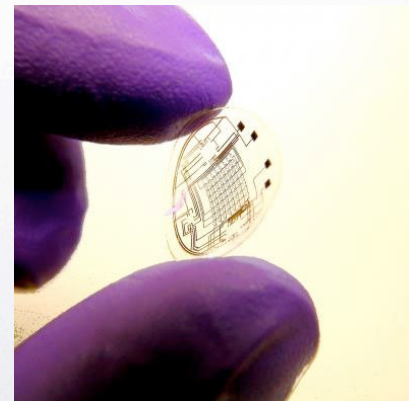
iPhone



Netbook



Nanotech



Contact Lens Display (UW)



# Big Applications



Virtual Worlds



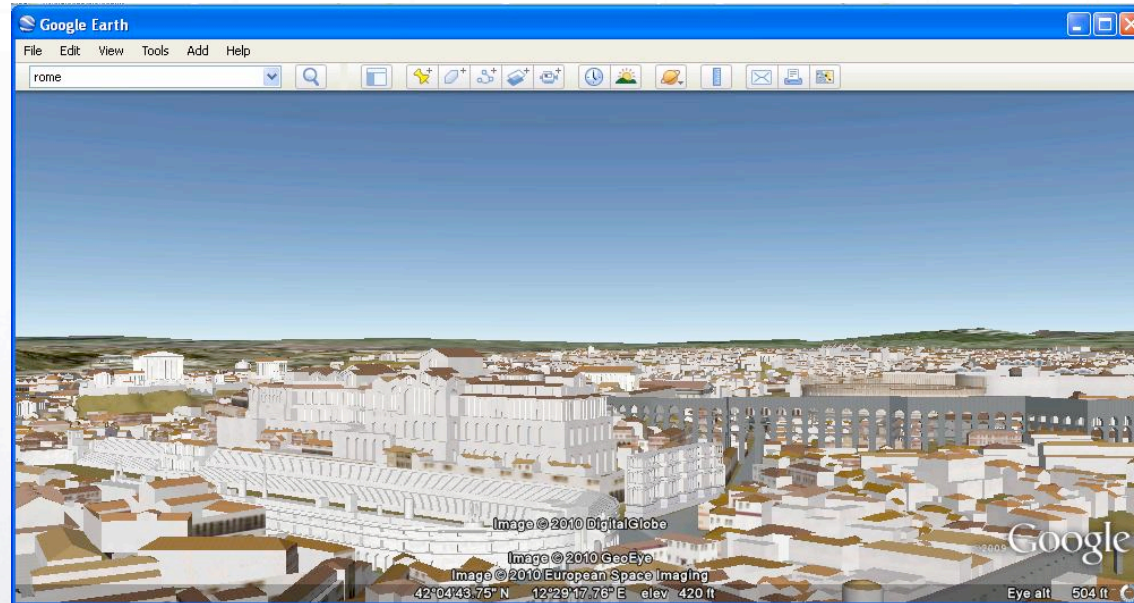
Maps



Augmented Reality

- Data/Computation Intensive, Context Dependent

# Google Earth 3D Ancient Rome



- Interactively explore ancient Roman buildings

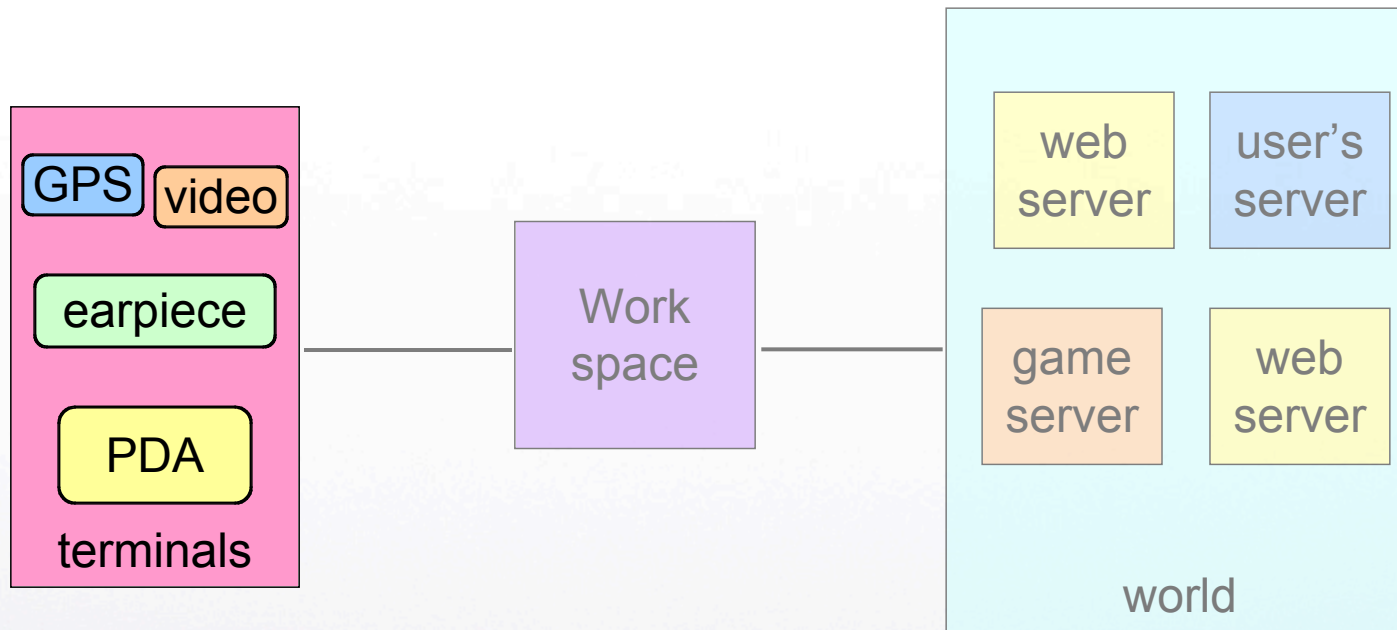


# Application Characteristics

- Data Intensive
- Computation Intensive
- Sensor data
- Frequent user-interaction
- Poor native performance on client

- Background and Motivation
- System Architecture
  - Terminals
  - World
  - Architecture
- Adaptation of Applications
- Completed Work
- Next Steps

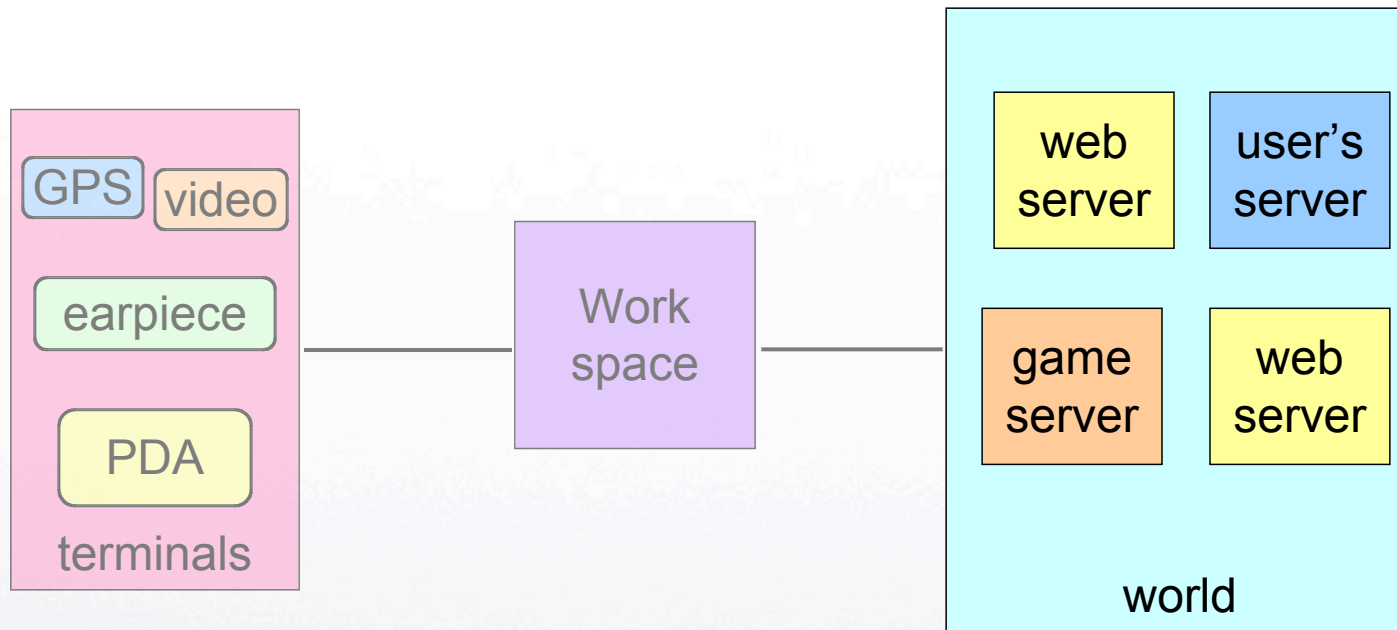
# Terminals



- A collection of input/output devices and sensors

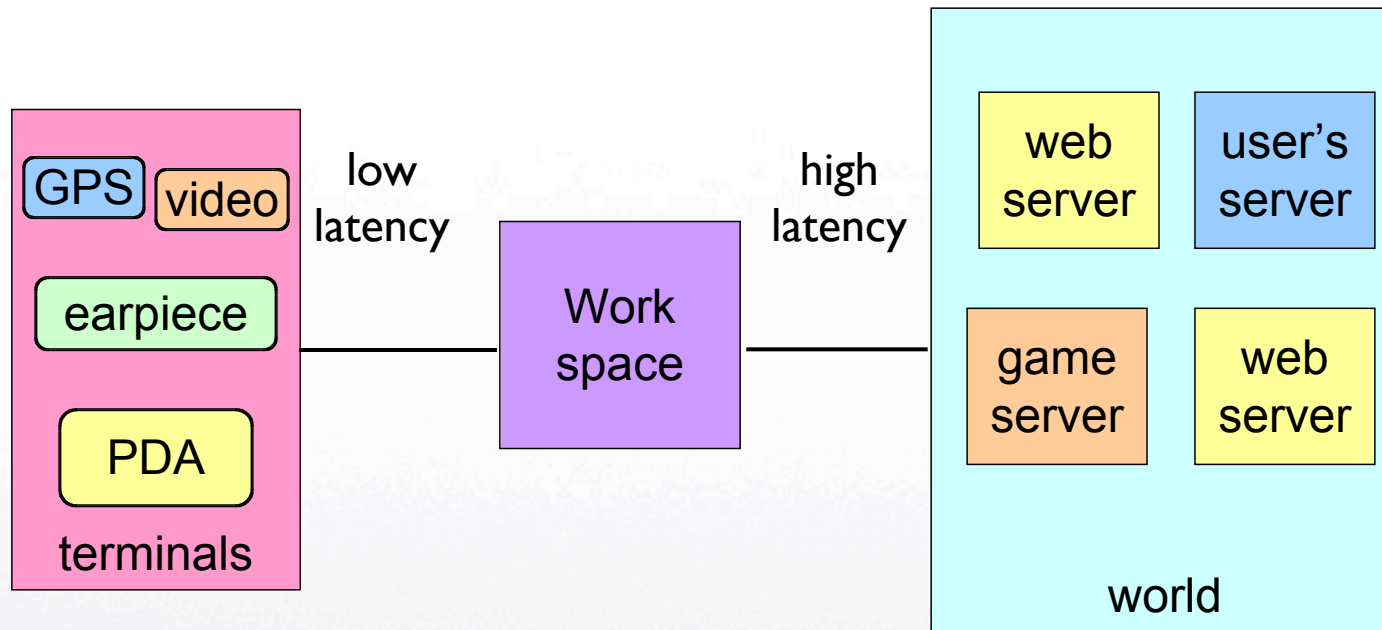


# World

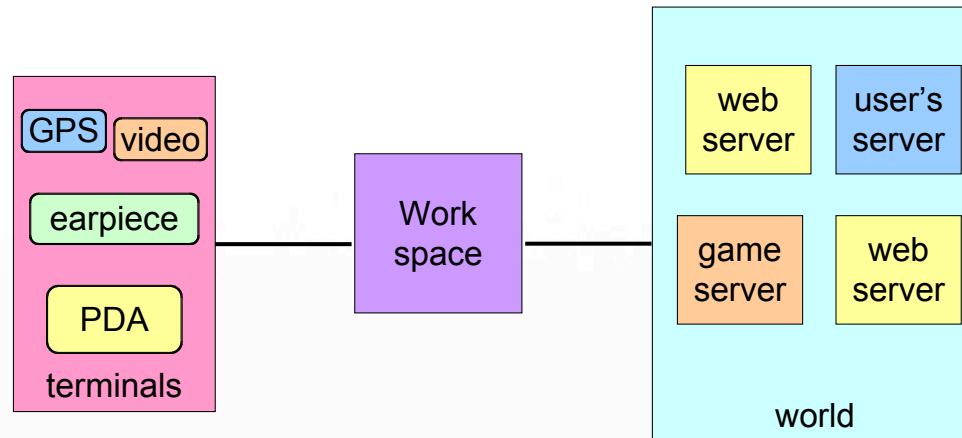


- Various servers scattered over the internet.

# Architecture



# The Purpose of the Workspace

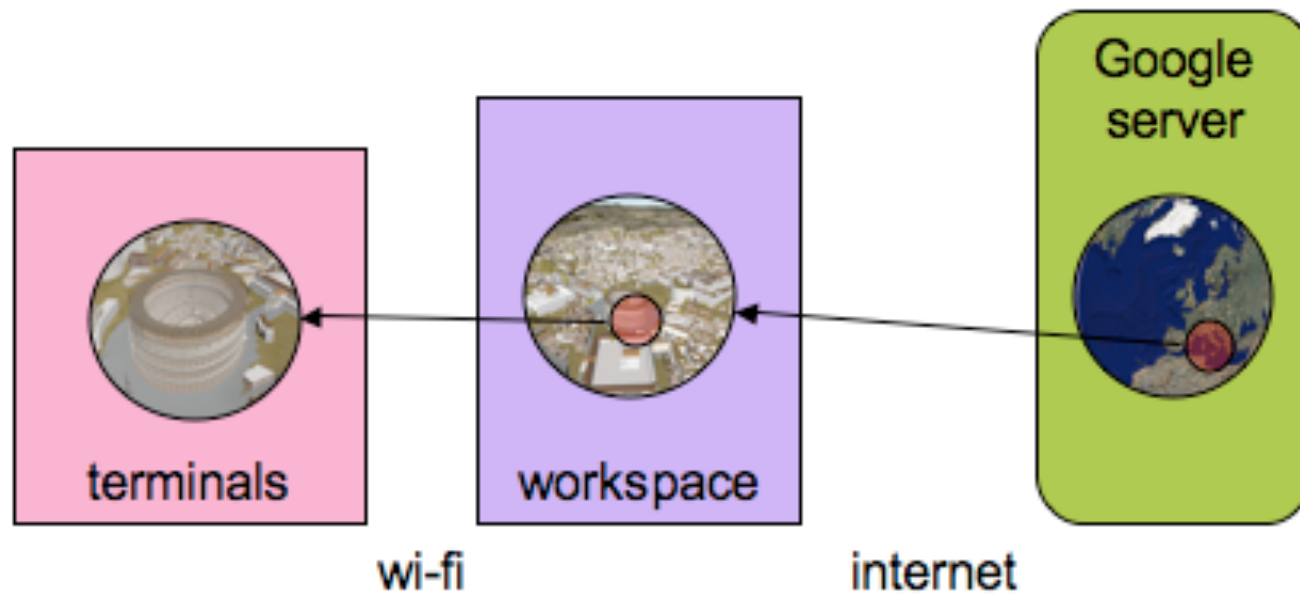


- Mediates between world and client, adjusting for performance
- Quick communication with the client
- Dependence on physical location runs
- Add additional functionality to programs
- Create mash-ups between multiple programs

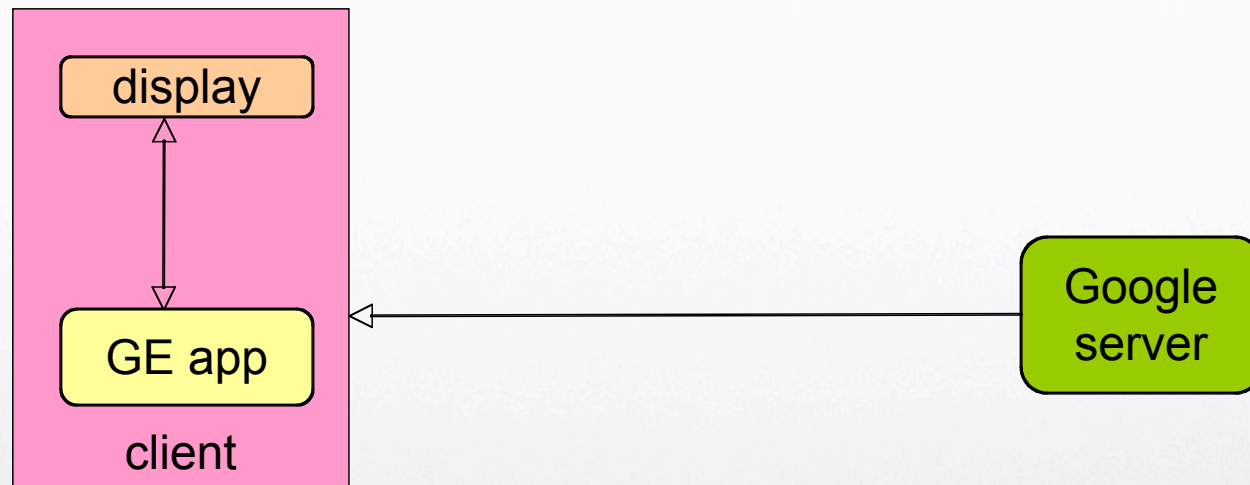


- Background and Motivation
- System Architecture
- Adaptation of Google Earth
- Next Steps

# Data Model

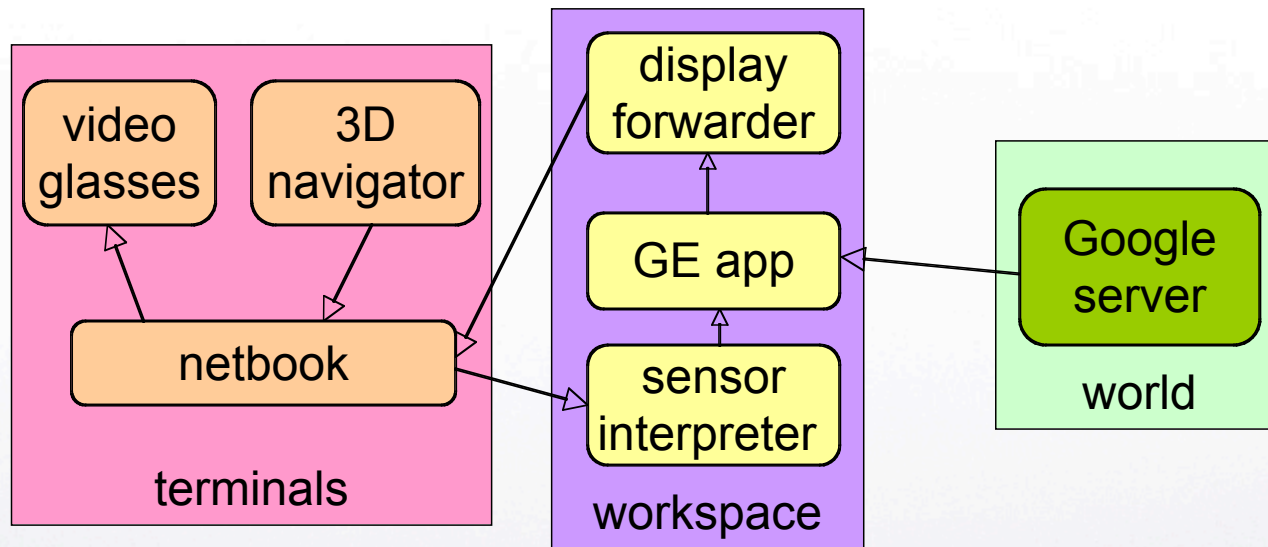


# Google Earth: Unmodified





# Google Earth



# Next Steps

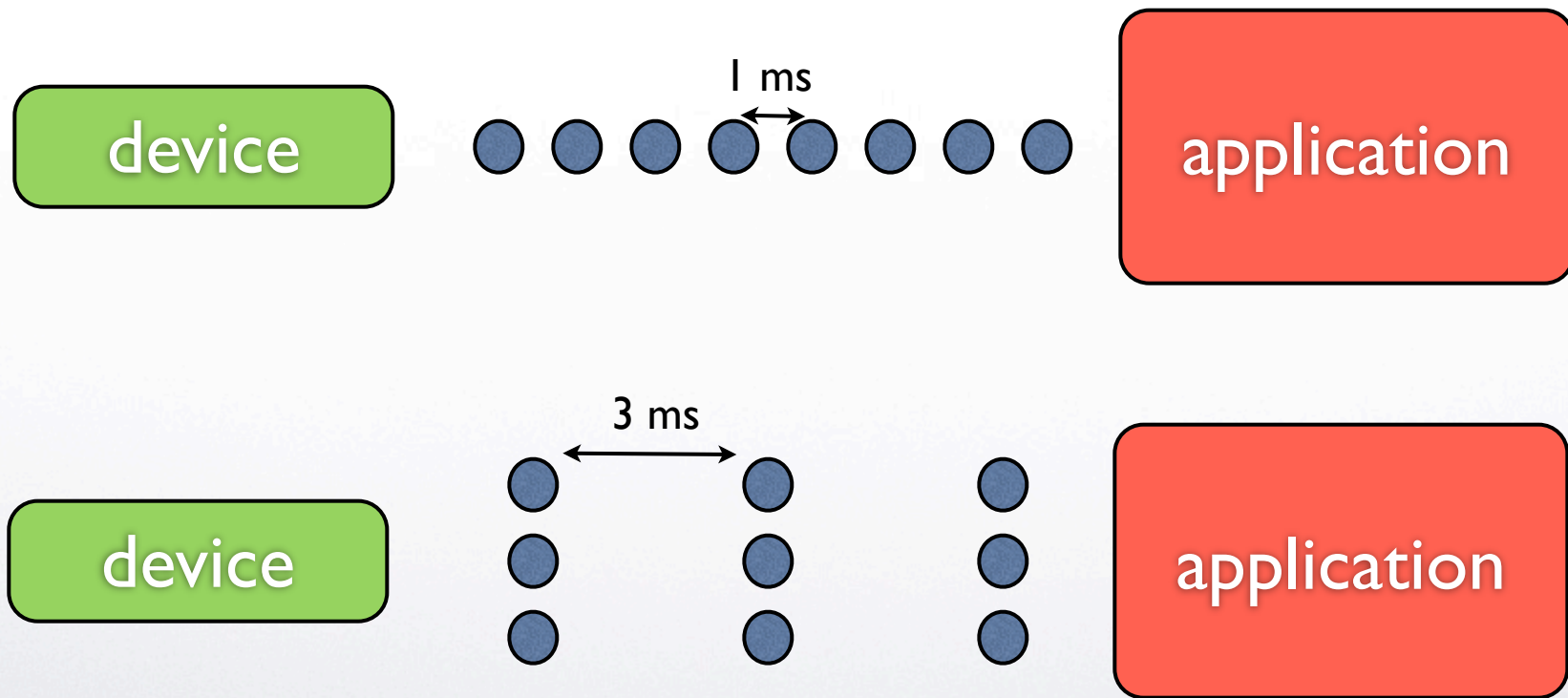
- Focus on I/O issues

# I/O Devices

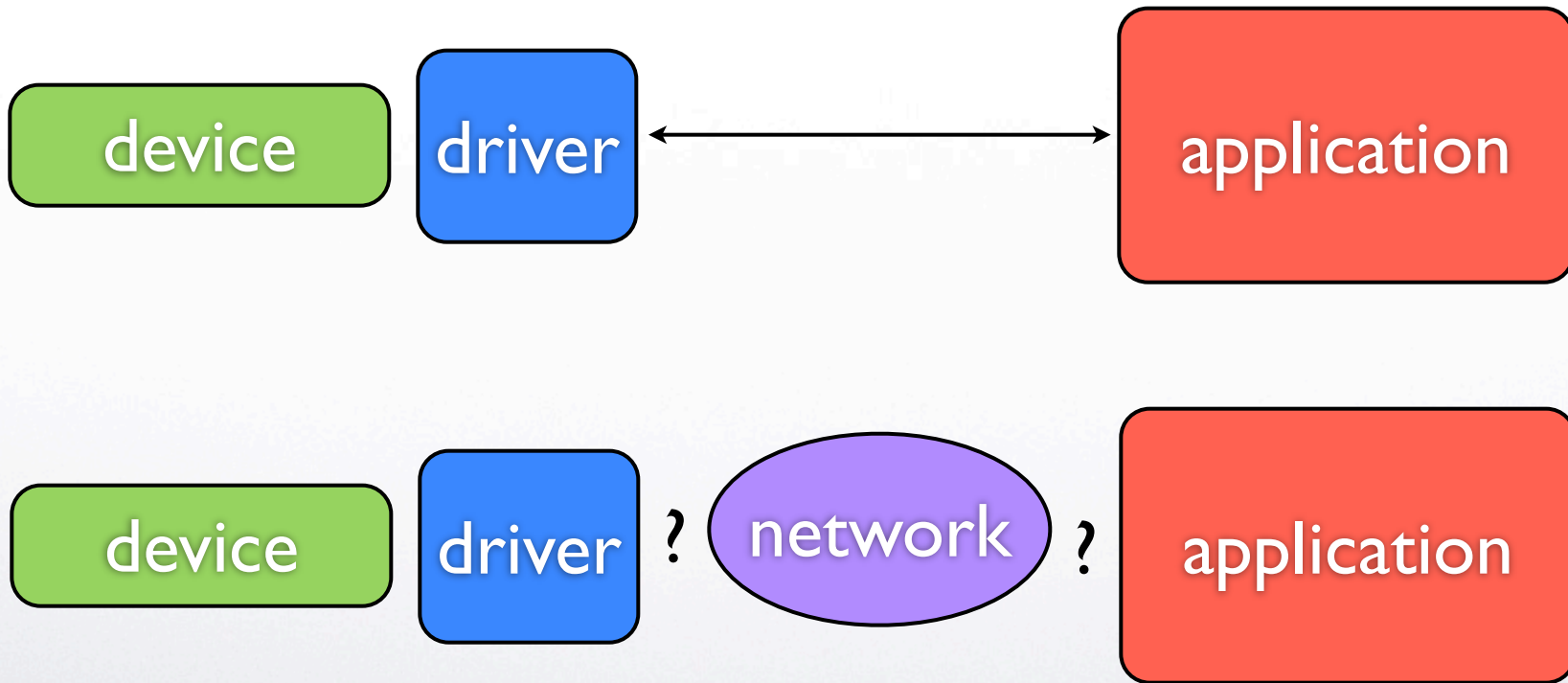
- camera
- microphone
- mouse
- accelerometer
- GPS
- temperature sensor
- light sensor
- RFID
- barcode reader
- keyboard
- biometric sensors
- touch sensor
- sound card
- video card



# I/O



I/O



# functions

- Caching
- Polling
- Buffering
- Encrypting
- Compressing
- Synchronizing Multiple Datastreams
- Transforming
  - Adding Timestamps
  - Averaging
  - Discarding Non-Recent Updates
  - Predicting Future Updates