Data mules and their usage

Reinholds Zviedris

University of Latvia

Task
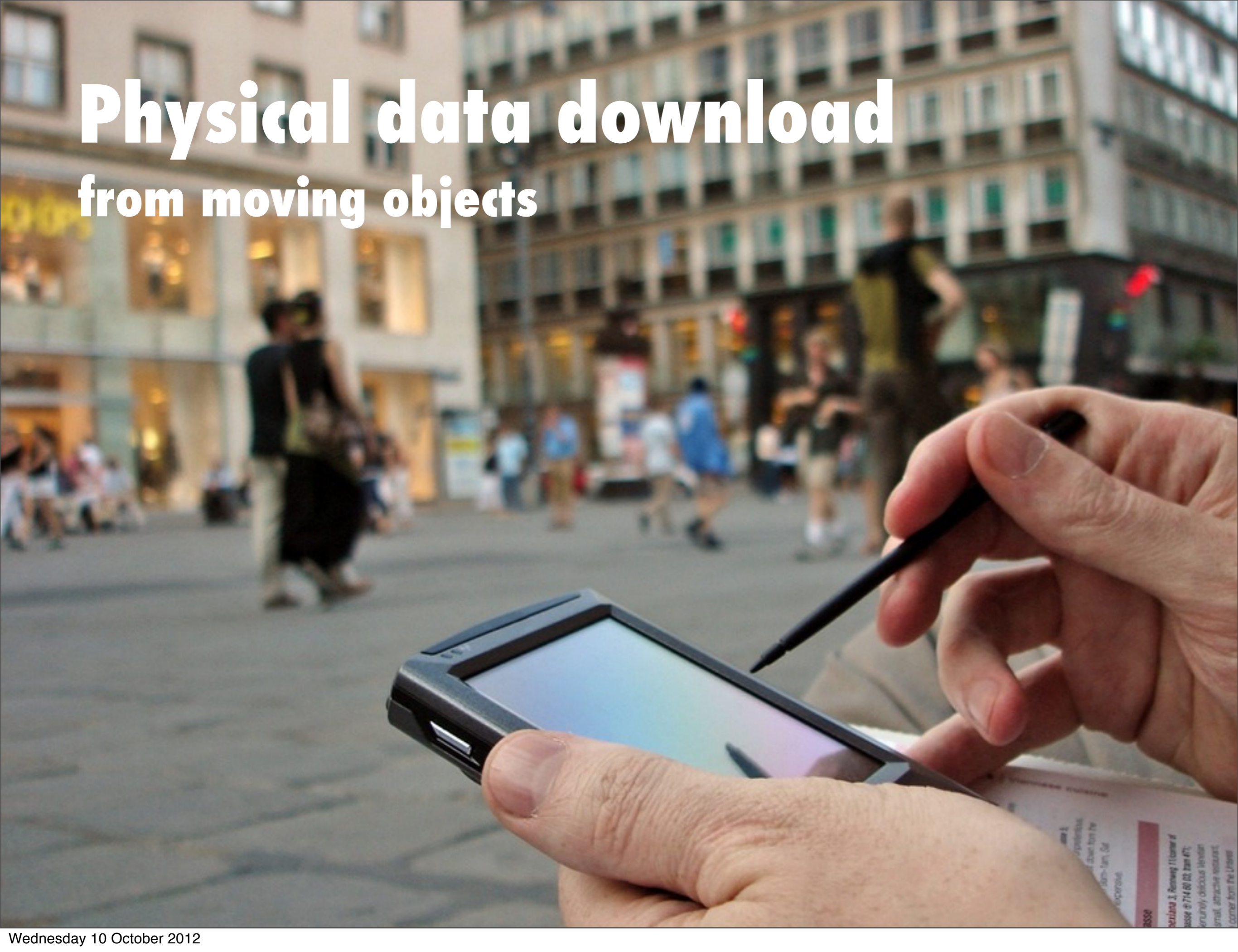
Maximally efficient
data exchange

Possible solutions
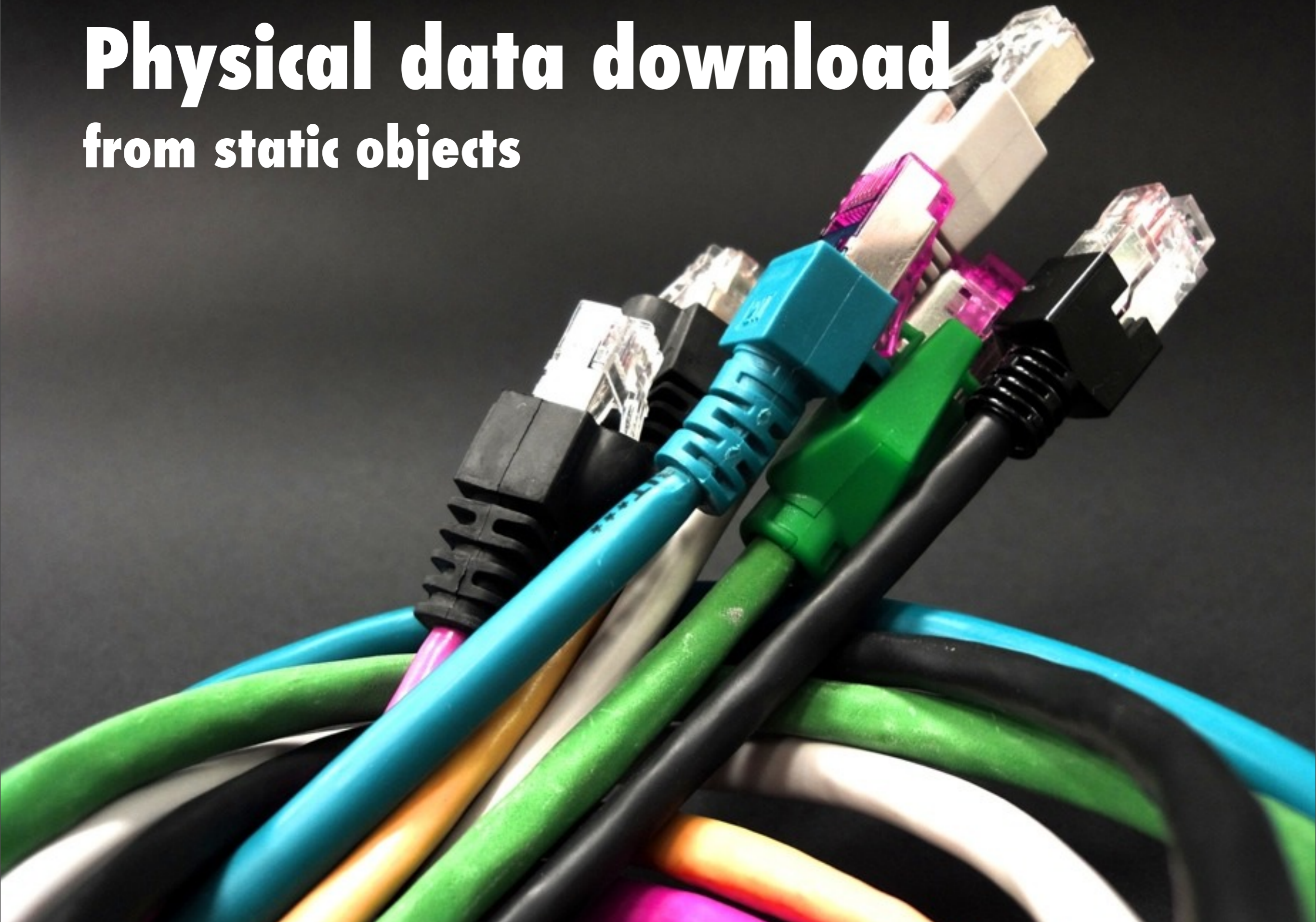
RADIO
WLAN
GPRS
SMS

Physical data download
from moving objects

Physical data download
from static objects

Multihop communication

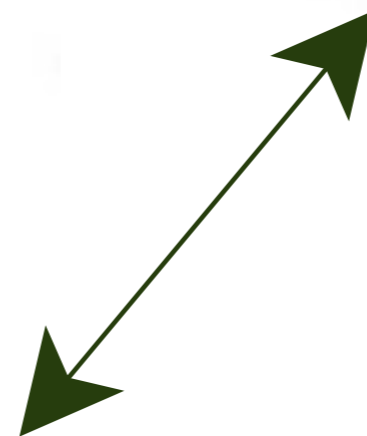# Architecture

Architecture

Wireless Sensor Node

Architecture

Data mule

Architecture

Data processing facility

Architecture

Advantages

Privacy

Mobility

Energy economy

Drawbacks

Undetermined latency

No assurance for
data delivery

Scientific problem
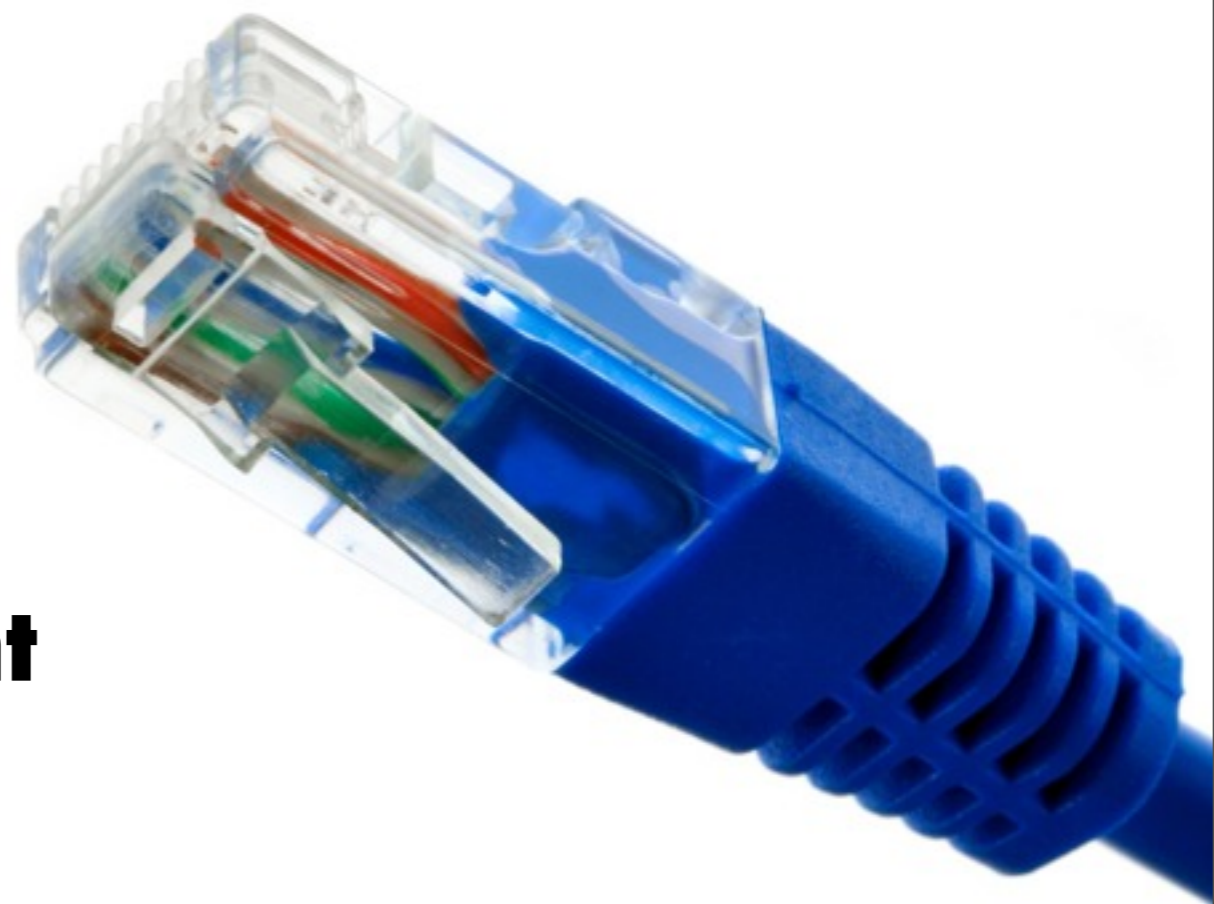
PROBLEM:
No delay tolerant IP protocol

CHALLENGE:
Fixity against latency

SOLUTION:
Adaptive protocol

Data transmission protocol

➡ **OS module**

➡ **Session based, store-and-forward type protocol**

➡ **Data transmission using packets**

➡ **Packet prioritization**

➡ **Packet encryption**

➡ **Two way realization:**

  ▸ **with acknowledgement**

  ▸ **without acknowledgement**
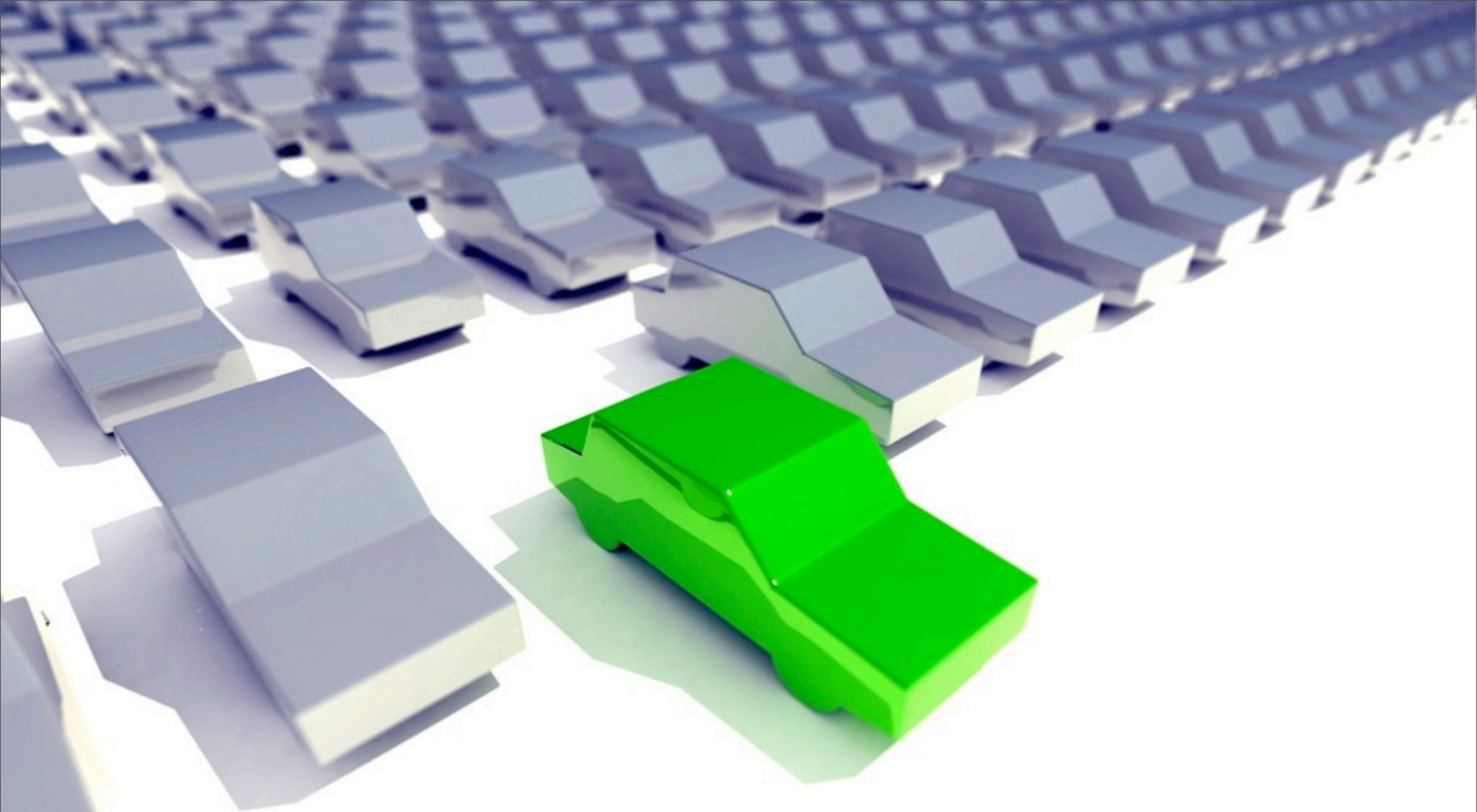
➡ **Address space**

Usages
real and potential

ZebraNet

http://www.princeton.edu/~mrm/zebranet.html

BikeNet

CafNet

http://cartel.csail.mit.edu/cafnet/

LynxNet

http://jupiter.cs.fmf.lu.lv/dilab/index.php/LynxNet

CARS as data mules

ROADSIDE INFRASTRUCTURE as base stations or static data mules

Scientific expectations
from "Smithy of Ideas 2010"

More potential usages for data mules

THANK YOU!

Questions?

My contacts:
reinholds@zviedris.com

Photos sources:
Google (http://www.google.lv)
stock.xchng (http://www.sxc.hu)
HubbleSite (http://www.hubblesite.org)