

Impact of home network on end-to-end Internet performance

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with

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Goal: Measure residential Internet access performance

Your fears confirmed: "up to" broadband speeds are bogus

By Nate Anderson | Last updated 16 days ago

Broadband providers in the US have long hawked their wares in "up to" terms. You know—"up to" 10Mbps, where "up to" sits like a tiny pebble beside the huge font size of the raw number.

In reality, no one gets these speeds. That's not news to the techno-literate, of course, but a [new Federal Communications Commission report](#) (PDF) shines a



Ofcom: Broadband ISPs are pulling a fast one

- Average speed 46% below that promised by ISPs
- Mandatory code and clear penalties vital, experts say

Graeme Wearden

The Guardian, Tuesday 27 July 2010

[Article history](#)

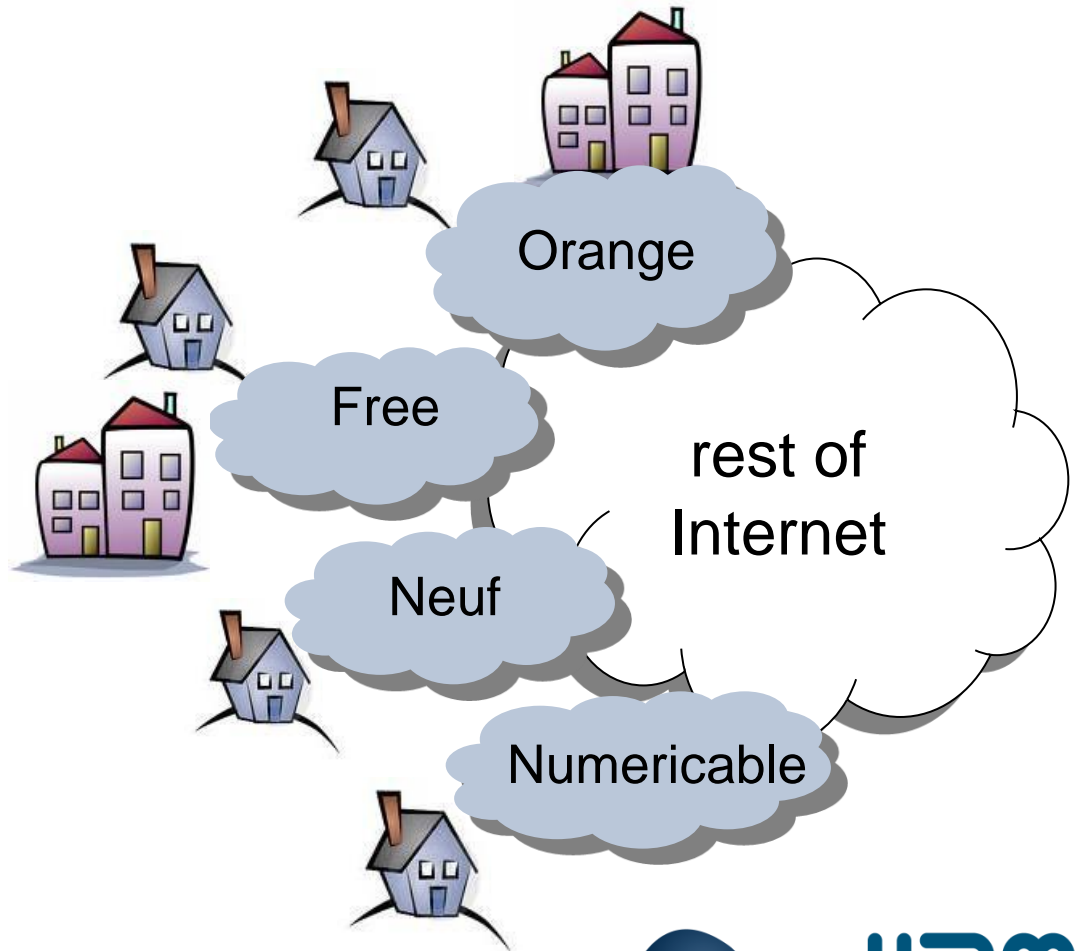
ACTUAL DOWNLOAD SPEEDS

As noted above, in 2009, average (mean) and median advertised download speeds were 7–8 Mbps, across technologies. However, FCC analysis shows that the median actual speed consumers experienced in the first half of 2009 was roughly 3 Mbps, while the average (mean) actual speed was approximately 4 Mbps. Therefore actual download speeds experienced by U.S. consumers appear to lag advertised speeds by roughly 50%.

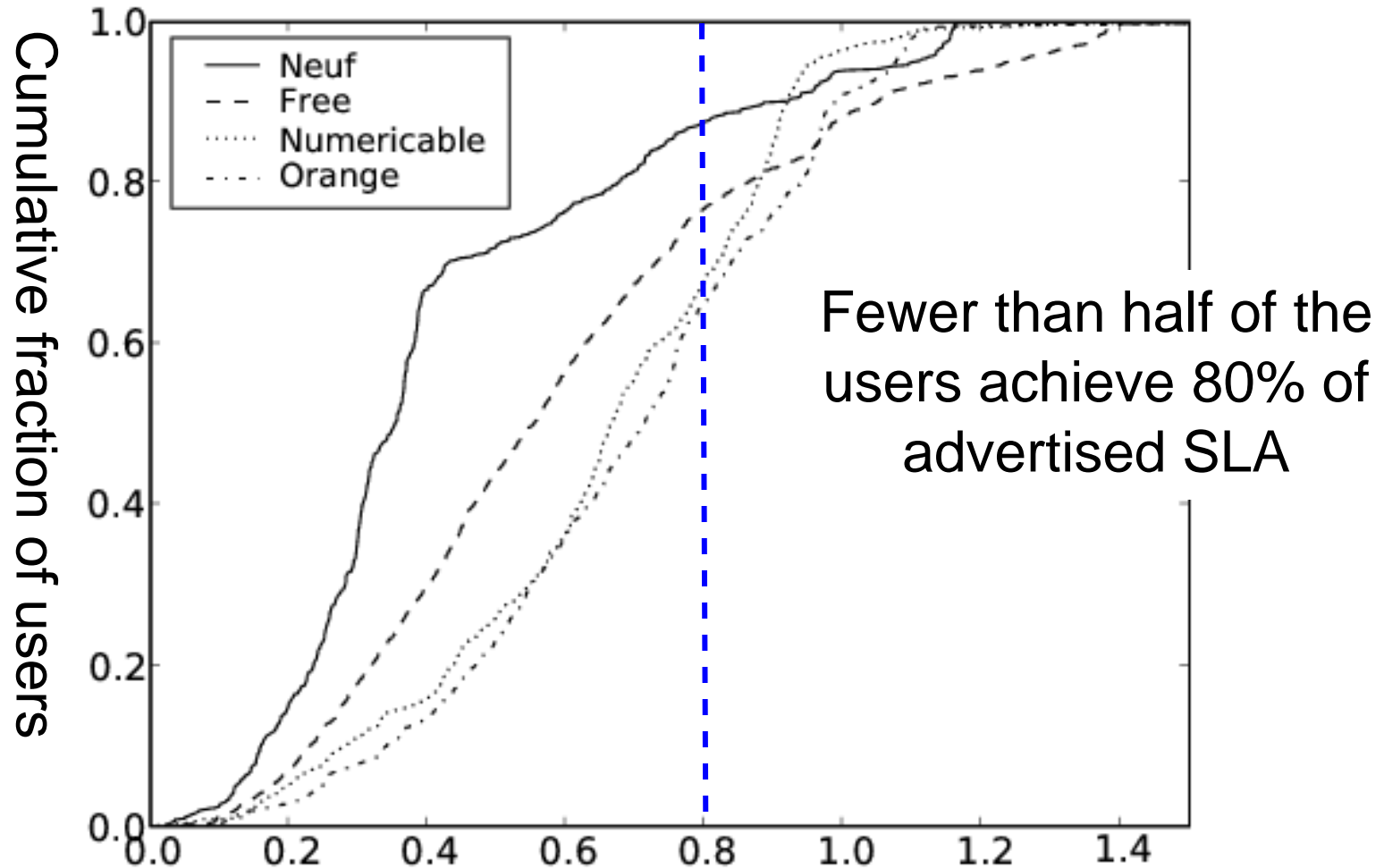
Our first take:



- Clients run at home computers in France
 - Pings
 - FTP download/upload
 - Metadata: ISP, SLA, and city
- Server reports “weather conditions” of each ISP



Hosts see variable performance

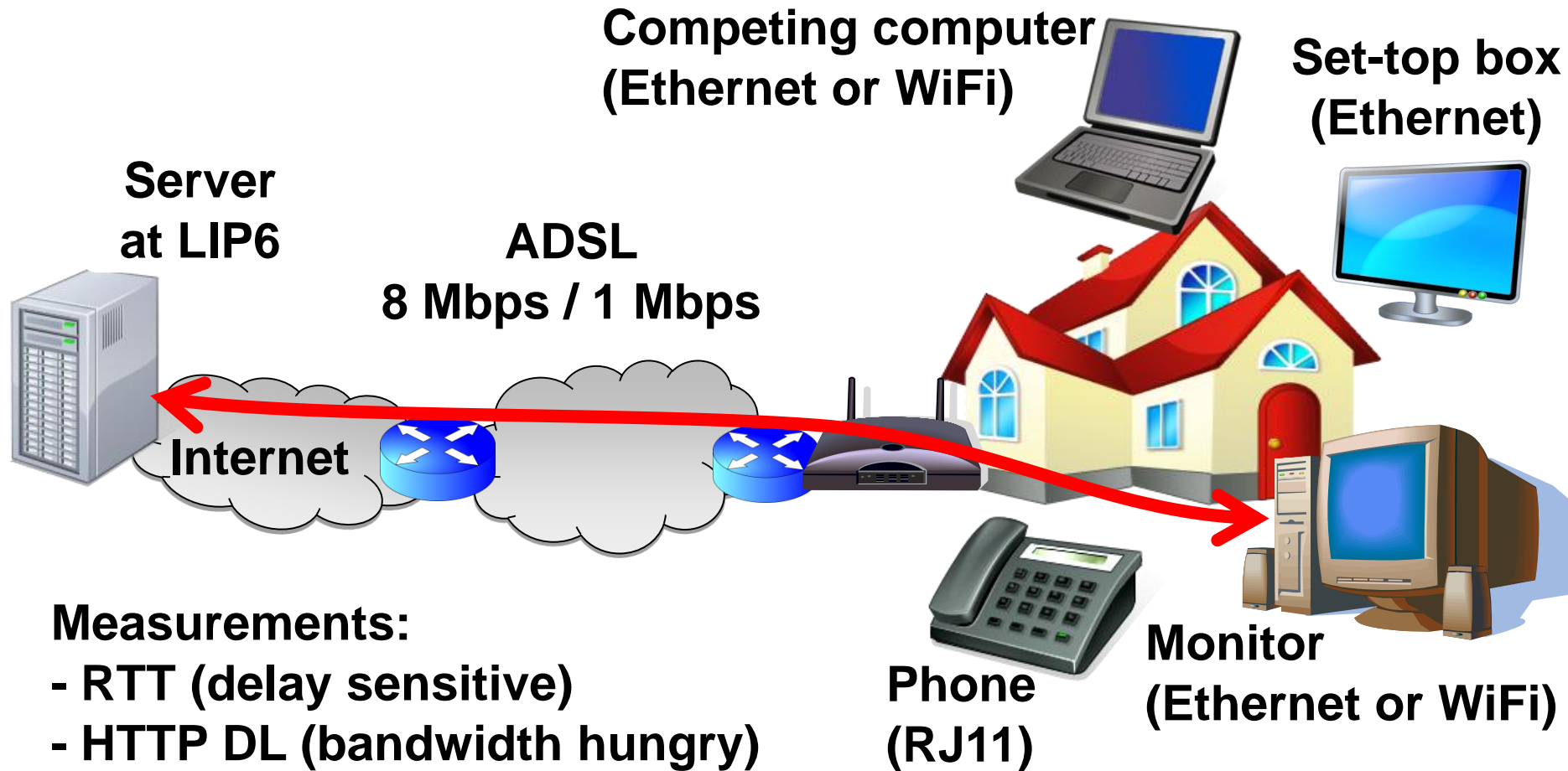


95th percentile of download speeds / advertised SLA

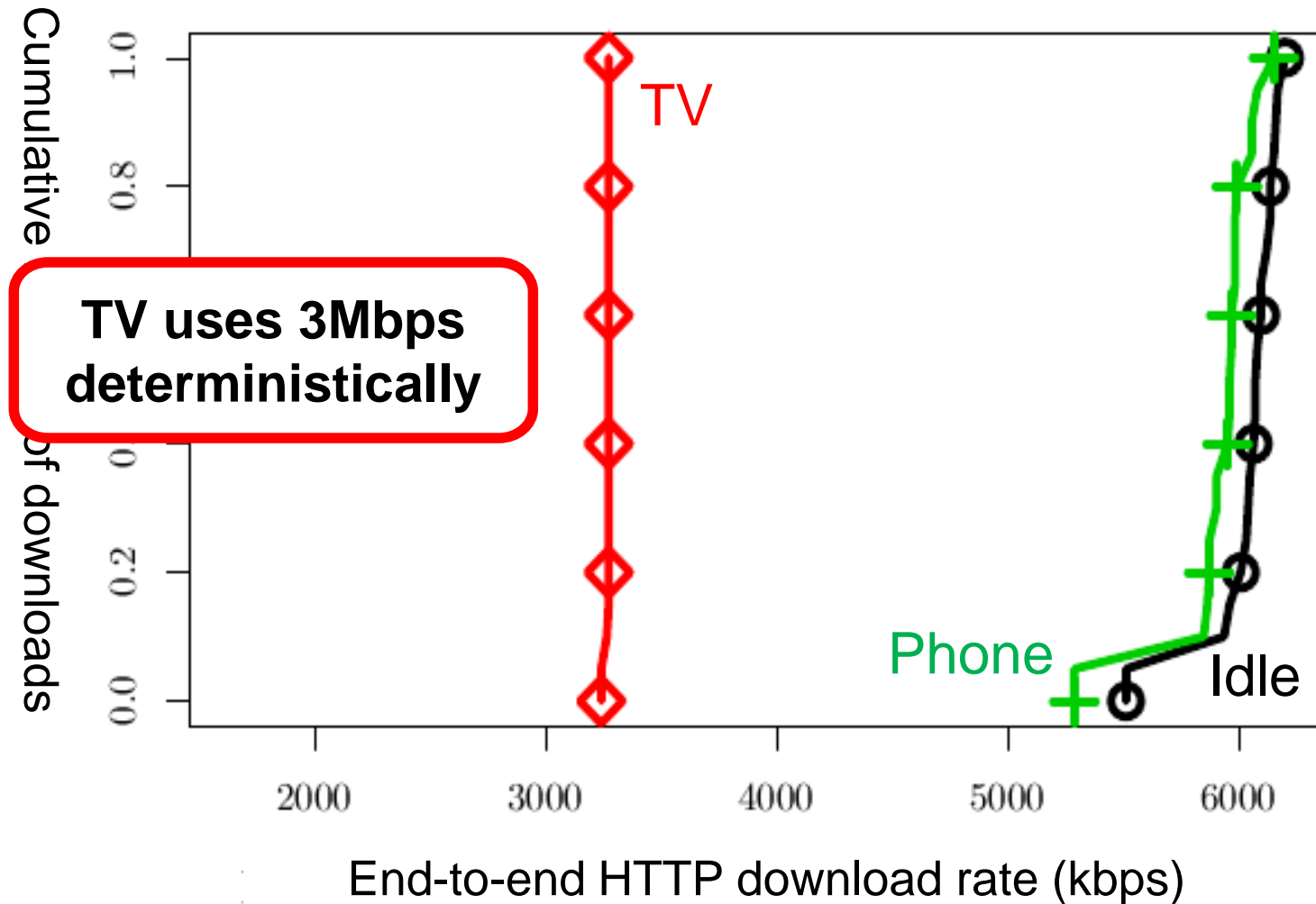
Problem: Home network is complex



Experiment setup



Triple-play services and HTTP DL



Goal: Distinguish between access and home problems

- Two approaches
 - Measure from the gateway: BISMark, SamKnows
 - Inference from end-hosts
 - Need data on current home networks: HomeNet Profiler



HomeNet Profiler: Design challenges

- Easy to use
 - Portable to most operating systems
 - One-shot, no installation required
- Incentives to participate
 - Report to learn about home network
- Privacy concerns
 - Use random identifiers to match repeated reports
 - Anonymize reported values
 - Users can skip measurements

Collected data

- User survey
 - Internet plan
 - Connectivity of devices in home network
- Network information
 - Count devices in home network
 - Neighbor WiFis
- Performance, security
 - Netalyzr
- Gateway information
 - UPnP implementation
- Computer config
 - Installed/running applications

Status

- HomeNet Profiler is up and running
 - <http://cmon.lip6.fr/hnp>
 - Runs for MacOS, Linux, and Windows
- Recruiting volunteers starting mid April 2011
 - CS Mailing lists, friends, family
 - Grenouille news
- Some numbers
 - 816 unique agents (438 in France)
 - 969 runs
 - 37 countries

Summary

- Home can significantly affect e2e performance
- Hard to distinguish whether problem comes from home or the access network
 - The gateway is the ideal vantage point
- Users need tools to identify problems in home
 - HomeNet Profiler as a first step

Please help us!

To run HomeNet Profiler:

<http://cmon.lip6.fr/hnp>

▪ References

- L. Di Cioccio, R. Teixeira, and C. Rosenberg, “Impact of home networks on end-to-end performance: Controlled experiments”, ACM SIGCOMM Workshop on Home Networks 2010.
- S. Sundaresan, W. de Donato, N. Feamster, R. Teixeira, S. Crawford, A. Pescapè, “Broadband Internet Performance: A View From the Gateway”, ACM SIGCOMM 2011.