Internet connectivity is central in today’s homes

- **Problem**
  - The home network can disrupt networked applications
  - Users don’t know what is happening

- **Muse’s goal: easy-to-use home network diagnosis tools**
  - Assist both users and ISPs
“Where is The Fault?” (WTF): ISP versus home wireless

- WTF: passive measurements at gateway
  - Performance bottlenecks experienced by users
  - No measurement overhead
  - Gateway directly “sees” bottlenecks
Neighbor-Assisted Delay Diagnosis

- Available measurements
  - Pings to gateways both internal and external interfaces
  - Cycle probes from Ethernet to WiFi and vice-versa

- System of equations
  - 4 independent measurements
  - 6 unknowns

- Assumption
  - Symmetric delays in WiFi/LAN
Home troubleshooting from the browser

- Build on top of the web browser
  - Available on most platforms
  - Familiar interface for users
  - Extend available browser APIs with Fathom Firefox extension (sockets, system configuration)
- Instrumented home gateway (optionally)
  - Open source projects such as OpenWRT/BISmark
  - UPnP capable gateways
- Leverage collaboration among devices
- Interactive troubleshooting with help of the user
Automated reporting from within the home network

- Device in the home collects user complaints
  - Users can report problems on TV, phone, tablet
  - Current prototype on STB
- Device generates performance reports
  - Periodic measurements: both querying gateway and active probes
  - Trigger measurements when users complain
- Operators use reports for troubleshooting