

Measurements at home

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Caveat

I have very limited first hand experience in doing the measurements myself but a rough idea of the issues involved.

- Early characterizations show that upto a dozen devices may be in homes
- Currently entertainment is primary focus
- Devices are made by multiple independent vendors and they are used independently and simultaneously by different users in the same home.
- Little is known about performance and load on network due to the devices
- Even less is known about impact of devices on each other

High level difficulties

- Measurement difficulties: getting the right cross section of homes to be considered a real sample is always going to be hard given the diversity and difficulty of obtaining data
- Interference: Working out the kinks of normal 'computing' and other activities, while measuring can impact measurement in unknown ways.
- Security and privacy concerns: Security/PII leakage from all the home devices chirping information to third parties is a risk. New and broader security measures for the home environment that are simple, adaptive, easy to manage and non intrusive are needed. As yet even characterization results, common in other environments, are pending in the home environment.

Technological diversity and management issues

Multiple home local networking technologies at physical layer complicates home router network management and optimal performance:

- HPNA (home phoneline networking alliance; networking over existing coaxial cable and telephone wiring in the home - “plugfests”)
- MoCA (multimedia over coax alliance - home entertainment networking standard)
- HomePlug (industry alliance - specs for broadband applications)
- 802.11g/b/n
- G.hn (ITU standard pushed by HomeGrid Forum)

Managing multiple networking technologies in a single home router and providing simple “home” network management to optimize performance for the consumer will be a key challenge.

QoS issues

Devices behind the home router have varying QoS requirements

- Femtocells (cellular base station for home use)
- Gaming consoles
- Over-the-Top TV/Video Streaming (Netflix Roku etc.)
- Multicast Video

Automated self-policing for each device and service on the home network needed to minimize contention

Content and application diversity

- Multimedia content and apps in the home network vary
 - home photos
 - videos stored on home DVRs
 - home gaming console applications
 - home appliance management applications
- Further, these are being accessed in a time shifted and place shifted manner and on devices with different form factors.
- Transcoding of content and enabling them in a time/place/device shifted environment requires simpler mediation platforms and protocols.