

Forecasting the Diffusion of Gigabit Home Networking In Europe

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ABSTRACT

The steady growth of broadband penetration and the ongoing progress in networking technologies have increased the importance of home networks in the provision of high quality internet services. Market stakeholders have cooperated to evolve home networking towards an integrated, converged Gigabit technology, which will completely change the Home Area Networks (HANs) landscape and will enable a wave of possibilities. As Gigabit HAN technologies have just been launched in the market, there is a necessity of studying their future penetration. However, the lack of historical data on which such a forecast could be based presents a barrier that existing literature has not successfully addressed. The present paper attempts to analyze and forecast the diffusion of Gigabit HANs by suggesting a novel approach that overcomes the limitations of previous works. The proposed methodology is based on historical analogies and employs an objective and statistically reliable approach to investigate the degree of analogy and influence between services that drive the diffusion of broadband and home networking. The data used in this work were extracted from Eurostat's database and the final results, in terms of expected HAN penetration, are quite optimistic.

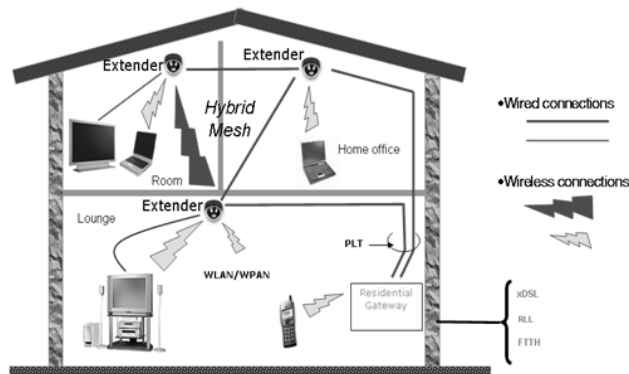
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INTRODUCTION

The explosive growth of Internet and the widespread diffusion of broadband technology have led to a steady rise in the importance of home networking and Home Area Networks - HANs.

Since the birth of the idea, home networks are continuously evolving and they are becoming an increasingly essential component of modern households. From the simplicity of a couple of telephone lines and a data modem to provide Internet connectivity, we have moved to complex home networks that are the centers for high quality online data and video services. This development clearly entails enormous

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Figure 1. A future home network (Javaudin et al., 2008)

global opportunities. For instance, according to (Transparency Market Research, 2013), the cumulative expected growth in the home networking device market is USD 46 billion from 2010 to 2018 as the growth prospects of tablets and other devices in home networks necessitate additional connectivity options. Apart from the economic realm, home networking is expected to produce increased societal benefits by enabling services such as telemedicine and remote collaboration. It can also contribute to worldwide sustainability by making it easier for employees to telecommute and by allowing for better control of home appliances, heating/cooling systems, sprinkler systems and more.

Despite of the optimism of experts from the telecommunications and entertainment markets however, today's reality in the field of HANs is still ridden by several problems and obstacles that hinder further progress. More specifically, the current home networking environment is a complex mix of heterogeneous technologies and devices, all operating independently of each other and certainly not offering the set of services originally imagined (Ericsson, 2009). This imposes a barrier in the adoption of technology inside homes and a lot of frustration on the part of the users that try to deal with the pain of management and debugging of home services (Edwards et al., 2011). Existing home networks are far from fulfilling the user expectations of high Quality of Experience, advanced home services and ubiquitous access to home network

resources while within or out of the borders of the house (Accenture, 2008).

Industry pundits, realizing these problems, envisioned a future home network, which they are calling the "smart home", or the "connected" home (Eurescom, 2009). It entails a set of computers, consumer electronics, mobile devices and sensors that seamlessly collaborate through wired, wireless, or a combination of such networks, to share content and enrich the home user experience through advanced services. It will be built around the residential gateway, which will link together the range of devices in the home and connect them with the Wide Area Network (WAN). The gateway will be connected to networking hardware capable of delivering high bit rates by using wired or wireless technologies such as Ultra Wide Band (UWB) or Visible Light Communications (VLC). To extend coverage throughout the home, the gateway may also use low frequency RF to connect to terminals, or use Power Line Communications (PLC) or Wi-Fi to connect to network bridges around the house. The idea is illustrated in Figure 1.

A more detailed description of such future home network will be given in the next section.

Presently, recent advances in standardization efforts and in networking technologies have brought HANs on the verge of a complete transformation, towards this direction of the envisioned future home network. We are getting very close to the marketing of integrated,

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