

Evolution and Recent Trends in Smart Home Technology

Bunty Singh, Ishuita Sen Guypa

CCSIT, TEERTAHANKER MAHAVEER UNIVERSITY, MORADABAD 244001

ishuita.computer@tmu.ac.in

buntysingh.bs165@gmail.com

Abstract— “Smart home” is the term commonly used to define residence that has appliance, lighting, heating, air condition TVs, entertainment audio, video system, security and camera system that are capable to communication with one another and can be controlled remotely by a time schedule from room in. This highlights the evolution and challenges in the development of Smart home.

Keywords— Smart home, video system, computers, appliance, security, mobility management.

I. INTRODUCTION

Smart Home” is the term commonly used to define residence that has appliance, lighting, heating, air condition TVs, Computers, entertainment audio, video system, security and camera system that are capable to communication with one another and can be controlled remotely by a time schedule from room in.

II HISTORY OF SMART HOME

The first Smart homes were ideas, not actual structures. Although the idea of home automation has been around for some time, actual smart homes have only existed a short while. This timeline focuses on hardware; meaning actual inventions leading up to the smart homes we know today and can expect from the near future.

A. 1901 – 1920- The invention of home appliance-

Although home appliances aren't what we'd consider “smart,” they were an incredible achievement in the early twentieth century. These achievements began with the first engine-powered vacuum cleaner in 1901. A more practical electricity-powered vacuum was invented in 1907.

B. 1966 – 1967 – ECHO IV and the Kitchen Computer –

The ECHO IV was the first device. This clever device could computer shopping list, control the home's temperature and turn appliances on and off. The Kitchen computer, developed a year later, could store recipes but had the unfortunate tagline, “if she can only cook as well as Honeywell can computer” and therefore sold no models.

C. 1991 – Gerontechnology–

Gerontechnology combines gerontology and makes the lives of senior citizens easier. In the 1990s, there was a lot of new research and technology in this sector. Life alert is one example of gerontechnology.

D. 1998 – Early 2000s – Smart Homes –

Smart homes, or home automation, began to increase in popularity in the early 2000s. As such, different technology began to emerge. Smart homes suddenly became a more affordable option, and therefore available technology for consumers. Domestic technology, home networking, and other gadgets began to appear on store shelves.

MOBILITY MANAGEMENT

Mobility is one of the most important issues in next generation networks. As WSNs are becoming the next elements of the future Internet, it is crucial

THE FUTURE OF HOME AUTOMATION



Fig.1 Example of an unacceptable low-resolution image

CNN prophesies that the smart home of the future will be a bit like what we're seen in the animated series, "The jetsons." Look forward to digital cutting boards(digital everything,really), molecular cooking devices, and so much more.

ARCHITECTURE OF SMART HOME

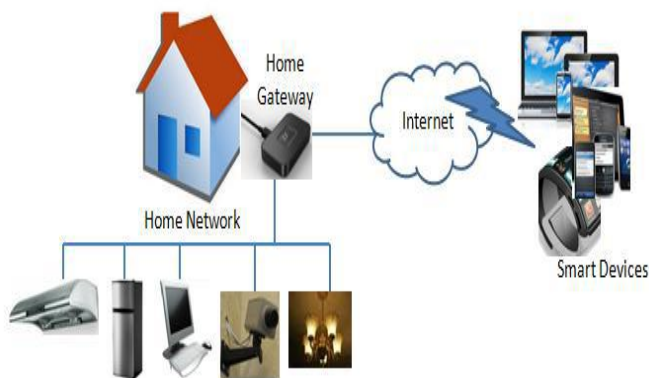


Fig.2 Example of an image with acceptable resolution

In traditional smart home architectures, it generally common that all components in a home network are controlled by a home gateway that acts as service provider for users [2]. From this home

gateway, all other appliances and components are controlled by the users and all protocols for operating the home equipments and appliances are defined in this home gateway. Figure 1 outlines a traditional setup for a smart home controls other home appliances and also connects with other user devices through the Internetarchitecture wherein the home gateway connects with other user devices through the Internetarchitecture wherein the home gateway

RECENT ADVANCES IN SMART HOME

Smart home environments can provide custom behaviors for a given individual. Considerable amount of research has been devoted to this topic. The research on smart homes is now starting to make its way into the market. It takes a considerable amount of work and planning to create a smart home. There are many examples of products currently on the market which can perform individual functions that are considered to be part of a smart home

QUALITY OF SERVICES (QOS) PROVISION

QoS support is challenging due to severe energy and computational resource constrains of wireless sensors. Various service properties such as the delay, reliability, network lifetime, and quality of data may conflict; for example, multi-path routing can improve the reliability; however it can increase the energy consumption and delay due to duplicate transmissions. Modeling such relationships, measuring the provided quality, and providing means to control the balance is essential for QoS support. There are various research opportunities in enhancing the QoS

of WSNs. One of the researches is the project described by Abidin (2009) that analyzes and enhances the performance of a WSN by deploying a simple max-min fairness bandwidth allocation technique.

MOBILITYMANAGENENT

Mobility is one of the most important issues in next generation networks. As WSNs are becomi

ng the next elements of the future Internet, it is crucial to study new models that also support mobility of these nodes. WSNs are applicable in variety of cases that make it difficult to produce a standard mobility scenario. Following are some cases where the mobile support is necessary presented in Camilo (2008).

Intra-WSN device movement is probably the most common scenario in WSNs architectures, where each sensor node has the ability to change from its local position at run time without losing the connectivity with the sensor router (SR). In the case of inter-WSN device movement, sensor nodes move between different sensor networks, each one with its SR responsible to configure and manage all the aggregated devices.

A research project of IETF working group NEMO, an example of WSN movement is described in RFC-3963 by Devarapalli (2005). Sensor network deployed in a moving bus is a real scenario of this type. It is possible to have a scenario where a sensor network can use another sensor network in order to be connected through Internet. MANEMO (Wakikawa et al., 2007) project is also an example.

SECURITY AND PRIVACY CONCERN

The field that paid less attention is the privacy concern on information being collected, transmitted, and analyzed in a WSN. Such private information of concern may include payload data collected by sensors and transmitted through the network to a centralized data processing server. The location of a sensor initiating data communication, and other such context information, may also be the focus of privacy concerns.

In real world applications of WSNs, effective countermeasures against the disclosure of both data and context-oriented private information are indispensable prerequisites. Privacy protection in various fields related to WSNs, such as wired and wireless networking, databases and data

Conclusion

Conclusion The optimization of the utilization of Hierarchical Mobile IPv6 with the Smart Home Systems provides mobility and enhanced communications and interconnection for home networking that could lead to efficient, reliable, and emergent services a home networking has to offer. The architectural design of smart home based on hierarchical mobile IPv6 could provide a seamless convergence for communicating between the users and the home devices and equipments as he is away of his residence. The home owner have an autonomous control of the home devices and equipments even if he changes location or network provider since the system is installed with IP addresses recognized with proper authentications.

REFERENCES

- [1] V. Redriksson, "What is a Smart Home or Building", (2011) April, <http://searchcio-midmarket.techtarget.com/definition/smart-home-or-building>, Accessed: December 2011.
- [2] L. -C. F. C.-L. Wu and C. -F. Liao, "ServiceOriented Smart-Home Architecture Based on OSGi and Mobile- Agent Technology", Systems, Man and Cybernetics, Part C: Applications and Reviews, IEEE Transactions, (2007), pp. 193–205.
- [3] http://en.wikipedia.org/wiki/Mobile_IP.
- [4] R. D. Caytiles, Y. E. Gelogo and B. J. Park, "An Integrated Security Handover Scheme for Seamless Convergence Services over IP-based Mobile Networks", International Journal of Control and Automation, vol. 4, no. 4, (2011) December, pp. 55-62.
- [5] http://en.wikipedia.org/wiki/Home_automation.
- [6] I. Bierhoff, A. van Berlo, J. Abascal, B. Allen, A. Civit, K. Fellbaum, E. Kemppainen, N. Bitterman, D. Freitas, K. Kristiansson, "Smart home environment", [http://www.snapi.org.uk/cost219ter/inclusive_future/\(14\).pdf](http://www.snapi.org.uk/cost219ter/inclusive_future/(14).pdf).
- [7] M. Edmonds, "How Smart Homes Work - Setting Up a Smart Home", (2011), Available at: <http://home.howstuffworks.com/smart-home.htm>, Accessed: December 2011

[8] http://en.wikipedia.org/wiki/Mobile_IP

[9] R. J. Robles and T. -h. Kim, Applications, Systems and Methods in Smart Home Technology: A Review, International Journal of Advanced

Science and Technology, vol. 15, (2010) February, pp. 37-48.