
Case Study

**Intelligent Home**

Intel® IXP425
network processor

# Digihome* Solutions uses Intel® Network Processor to Power Intelligent Homes

**Summary**

**Safety Need:** Imagine you're boarding a flight and remember you've left your entertainment system, air conditioner or heater on? In such a situation, short of having someone to call for help, you've no way out. All you can do is keep worrying...or look for a solution to ease your mind! Now a range of point solutions are available for digital homes. Keeping in mind today's busy lifestyle and unsafe environment, an Intelligent Home assures you of a safe and comfortable lifestyle.

## Digihome* Solutions

### Challenge

Current solutions come in the form of Safety and Security products, Automation products, EPABXs and Set-top-boxes. However, there is no all-in-one solution. Also, these point solutions don't interoperate. As a result, there is a problem installing, using, maintaining and exploiting full potential of digital home features. Also, all these solutions typically cater only to an individual apartment or house and rarely cater to apartment or housing complexes. There are also other issues due to analog signaling, limited storage, non-remote access, etc. Solutions are mainly being sought not only for individual homes, but also for big housing or apartment complexes having hundreds or even thousands of dwelling units.

### Solution

An Intelligent Home is a fully-integrated solution designed for individual apartments and houses, as well as apartment and housing complexes. These homes provide Safety, Security, Automation, Entertainment, Communication and Information features in one, single solution. The solution also caters to safety, security and communication requirements outside individual apartments or homes, but within an apartment or housing complex. The solution is completely digital as well as Internet Protocol (IP) based and allows for remote management from Internet Browsers, Mobile and fixed-line phones.

"Intel is excited to be a part of this revolutionary concept of Intelligent Homes which would bring significant advancement in the life of the common man."

Satish N. Jadhav
Sales Manager Intel South Asia Embedded Business

## Background: Home Automation through Digihome*

Digihome Solutions Private Limited develops solutions to manage infrastructure of modern, digital homes. These Intelligent Home solutions are built on and around Aftek's* technology core.

Digital convenience of a connected home is the need of the hour. Safety, security and automation are no more luxuries but are demands of the prospective buyers and Digihome* Solutions provides just these for the end-user. They also add great value to a builder's brand and real estate product, and put him in a different league. Faster sales and a proportionately higher return on investment are natural outcomes.

## Featured solutions for Intelligent Homes

Intelligent Homes address the Safety, Security, Automation, Entertainment, Communication and Information needs of modern digital homes. These homes are implemented as multiple, physical boxes or modules. Automation, Safety, Security and Communication features are provided by a Data and Voice Gateway (DVG) module. Entertainment features are provided by a Media Center (MC) module. The Intel® IXP425 network processor is a compelling processor that handles performance and feature requirements of DVG and MC.

Safety features include wired and wireless pendants for emergency signaling, smoke, fire and Liquefied Petroleum Gas (LPG) leakage detectors, as well as video surveillance for remote monitoring. Security features include secure access to home based on Smart Card or Biometric authentication and a variety of motion detectors and limit switches for intruder detection. Automation features include automated and remote control of lighting and appliances. Entertainment features include multi-room, digital cable with recording, Video-on-Demand, etc. Communication features include an Electronic Private Automatic Branch Exchange (EPABX) with Public Switched Telephony Network (PSTN) and Voice-over-Internet-Protocol (VoIP) communications within the home, apartment complex or outside. Information features include wired and wireless access to Internet as well as monitoring and control of all modules and features from a console within the home.

"The Intel® IXP425 network processors offered optimal performance, feature-set, and price for Intelligent Home's unique requirements for portable, secure, and power-efficient processors supporting multimedia and touchpad capabilities"

Chandrashekhar Raje
CEO,
Digihome Solutions Pvt Ltd

## Intel enables cutting edge Intelligent Homes

This Intelligent Home solution is entirely based on Intel® processors. Intel provided a feature-rich solution at the appropriate price point. Data and Voice Gateway (DVG) as well as Media Center (MC) modules are based on Intel IXP425 network processor.

The final decision to use Intel's processors was taken after careful and elaborate evaluation of features and performance of various processors available in the market. Intel IXP425 network processor turned out to be the most suitable processor to handle performance and feature requirements of DVG and MC. In fact, it appeared to be designed perfectly for residential gateways like DVG.

DVG had very high MIPs and memory requirements, since it was to handle 100Mbps wired and 54Mbps wireless data traffic along with 3 VoIP channels supporting audio CoDecs like G.723, G.729, etc. MC also had very high MIPs and memory requirements since it was to handle video CoDecs like MPEG1/2/4, WMV, etc. Intel IXP425 network processor was able to support close to 500 MIPS with 256MB of SDRAM as well as Flash and 32KB of cache memory. DVG had a special security requirement, since it interfaces with not only other DVGs in other apartments or houses, but also with public internet. DVG needed a firewall and secure, encrypted communications support. Security features supported by NPEB of Intel IXP425 network processor were very useful for this. UTOPIA bus of Intel IXP425 network processor was useful for supporting ADSL internet connection. PCM bus on HSS-0/1 was extremely beneficial for supporting incoming PSTN lines and in-house POTS extensions. Thus with most of the features being supported by Intel IXP425 network processor itself, DVG design turned out to be very minimal, simple and robust. Amongst all other Intel® network processors, Intel IXP425 network processor was the only one with 500 MIPS performance, security features and UTOPIA bus. On software front, ARM/X-Scale core was best supported by development tools and embedded Linux*, which was selected as software platform for DVG. With such formidable features and performance, the Intel IXP425 network processor was clearly the best of the breed in Intel network processors.

### Some Key Features of Intelligent Homes

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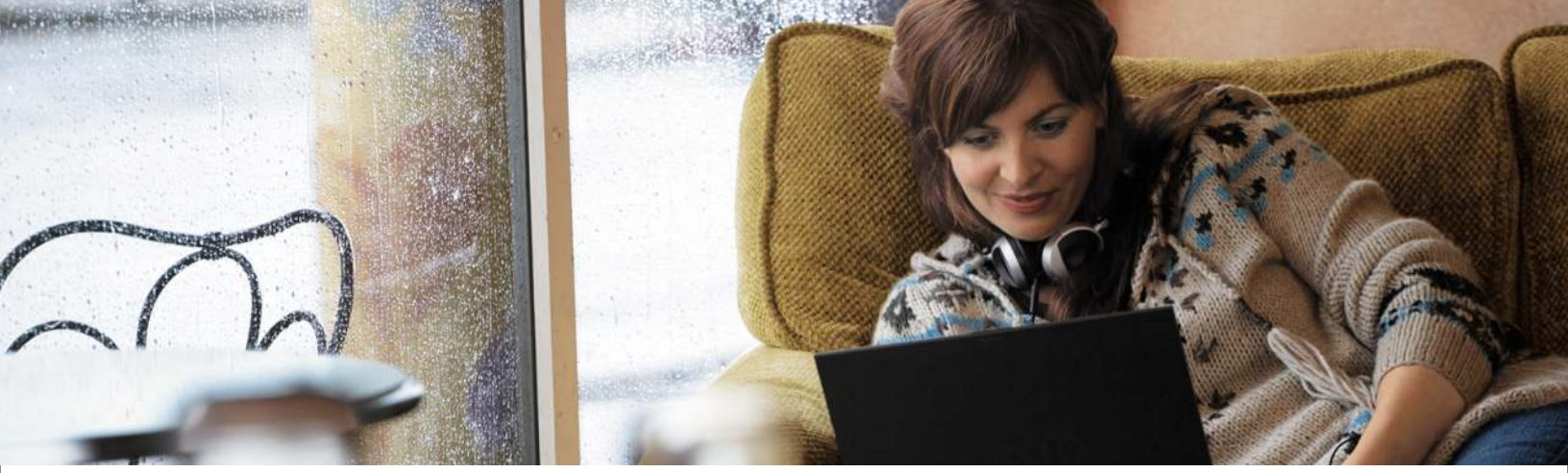
| Wi-Fi Connectivity | 128Kbps broadband connectivity |
| Universal Phone | Replacing the standard PSTN phone instrument Works on Wi-Fi connectivity |
| Single Button Emergency Call | A panic button that will send a SMS or call automatically when pressed in an emergency |
| Digital Answering Machine | Personal voice message inbox for each member of the household |
| Smart Card Access | Only a Smart Card holder shall have access to the front door |
| Main Gate Security and Visitor Tracking System | Pictures of visitors are taken at the security gate and door, and are stored as records for future access |
| Stand-alone Video Surveillance | A camera placed at the main door takes an image of the visitor and displays it on an LCD screen inside |
| Keeping visitor's log when the Intelligent Home is locked | In the owners absence pictures of visitors are taken and can be accessed by e-mail |
| Event Tracking | The server can be programmed for reminders as well as voice messages |
| VoIP Phone | A universal phone at DigitalHome shall be used to make international calls |
| Receiving SMS without owning a mobile phone | SMS's can be received via the server and displayed on LCD screens within the home |
| Video Surveillance | Cameras shall be positioned around the complex with a displays within the home to keep track of children playing, etc. |
| Music and Videos | A complete entertainment access system is installed allowing for downloads, etc. |
| Switching on/off lights, fans, etc. | Electrical appliances can be controlled wirelessly |
| Fire Alarm | Fire detection devices are connected to the server and send messages to the concerned people in case of emergency |

## Conclusion

In an otherwise cost-sensitive market consumers are willing to pay premium for such ultra-modern homes. And strangely, in contrast to developed countries, the business model is still more product than cost oriented. Technology and solution costs are being built into the home costs as one-time costs and not spread over multiple years of service contracts. While Cable or Telecommunications operators are restricting their offerings to pure Cable or Telecommunications Gateways, builders are working directly with technology providers for Residential Gateways that are positioned to be the homes of the future.



### Intelligent Homes for an efficient future

Today Intelligent homes or home automation taps into various household networks, providing useful service through a central monitoring and control of devices, by opening up communication paths between the home and external locations. A few examples of home automation technology are response to voice commands; having lighting, heating, etc., respond and adjust automatically depending on the time of the day or whether the house is occupied; kitchen appliances are programmed in advance so as to be ready for a person waking up or returning home; e-mails and SMS messages can be routed through the home for the access of someone without mobile connectivity, etc. Intelligent Homes promise greater convenience, time saving, personal and familial security, as well as comfort.

**For more information log on to:**

**www.digihome.co.in.**

**http://www.intel.com/design/embedded/**

"For our residential project Wonder Futura we had planned to offer futuristic homes to our customers and decided to offer Intelligent Homes which was going to be first such offer in India for the middle class. The search for technology provider took us to Digihome* and they responded eagerly. From the concept to delivery it has been an exciting journey together. Wonder Futura our residential project with Intelligent Home features was an instant success as the customers valued the digital infrastructure for their homes."

Manoj Agarwal
Director,
Wonder Properties, Pune
www.wonderfutura.com

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Solution provided by:

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DIGIHOME SOLUTIONS



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