

Home Gateway Initiative - Vision

Evolution of the broadband market to date

The Internet has been a major driver for the evolution to broadband creating a new experience for the customer and offering him new services such as email, browsing, access to the World Wide Web and "online" services such as digital photo lab, ticket booking etc. Whereas broadband was once simply about the delivery of high-speed internet access and services to a PC, it is now being driven beyond the PC, to other devices and services in the home including mobile devices. The broadband network itself is being redesigned to deliver several new services in addition to traditional internet access, among which telephony; IPTV; gaming,

New trends in the market

There are 4 major trends that are shaping consumer requirements on the home network.

1. **Broadband is the baseline:** We have reached the stage where a majority of households understand that having a broadband connection is as much an essential part of their lives as plumbing and electricity. Not all will utilize its full capability, but broadband ubiquity opens up possibilities for business, government, schools, health care, security providers to offer services to consumers. Web2.0 and the long tail enhance capabilities in the broadband network for social networking, wikis, communication and information sharing among users. Individuals are offered greater choice and businesses are able to reach their customers based on new distribution possibilities.
2. **Complexity:** Multiple devices wish to share the broadband connection. Games consoles, PC's, telephones and IPTV settops all want a broadband connection, so the consumer needs to be able to share that connection between all devices, simultaneously. They need a way to simply turn on the device and obtain access to network based services. Data can cross a wide variety of physical media, from radio to power line, from twisted pair to coax. and fibre. And the customer wants it just to work, without having to understand all the complexities in how to get it to work.
3. **Convergence:** The most hyped convergence service is fixed mobile convergence (FMC), where the same service will work in the mobile network and the broadband network. Initially voice services are the most important FMC services, allowing the use of your mobile phone in the home network. But there are other converged services that are equally important to the consumer, including the convergence of home networks and broadband networks, i.e. making the home network a part of the Internet. Here the key issue, in addition to simplicity, is security. And of course there is the convergence of digital media and devices, where the key issue is how to move media from one device to another, sharing it with friends and while in the case of protected material, still protecting the interests of the content owners.
4. **Personalization:** There is a need to have personalized interaction with services and content across terminals and places. Users want the choice of services from multiple service providers combining and blending them at will to create new value. Parents want to limit their children's access to some services. To accomplish this, new enablers need to be created in the broadband network, extending from single-sign-on to presence based services, to user profiling. The personal integrity of the user also needs to be maintained.

Issues and future directions

There are a number of high level directions that can be derived from the trends enumerated above:

1. Home Network extension. Broadband will extend to every nook and cranny in the home supporting a multitude of devices. New technologies to carry QoS sensitive content will appear or mature. These technologies will need to work together, be plug and play and non-intrusive (i.e. no new wiring or user intervention).
2. Management. Clearly networking is complex to manage for both the customer and for the service provider who is often the first point of contact when a customer encounters a problem. There is a need to either simplify home networking, or for the service provider to manage the home network on behalf of the customer.
3. Premium QoS. Customers expect new premium services to be offered. Many of these services are already in place and include IPTV and IP-telephony. New services, like premium gaming with guaranteed QoS, will also appear.
4. Any service - Any device. Customers want to access broadband services from any appropriate appliance in the home, which means that devices must be integrated with the home environment and services need to be adapted to the capabilities of the home network. New services can be created by combining the different capabilities of devices in the home e.g. using the different displays and speakers to enable video rich communication. The customer also wants the capability to exchange multimedia content simply and easily between devices.
5. Any service - Any place. It is also expected that customers will increasingly demand the same services from wherever they are – beyond the home environment. For example - from a Wi-Fi hotspot, from hotels, or even other consumers' homes. To enable this, users must be able to access their home environment in a secure way. Capabilities that are network independent must be introduced (for example directory, authentication, etc.) and these must be independent of the device used (any screen can be used to access a customer service set).
6. Service enablers. Service provider requirements such as: service level agreements, protection of copyright material and secure economic transactions will need to be met.

A missing piece of the puzzle

A basic modem was initially offered to provide broadband access this has since evolved to a wireless enabled modem / router to meet the changing demands of the consumers. However, this equipment was not capable of supporting the next generation of services to the home. This drove the need for a more capable device known as the 'Home Gateway', which enables a range of services to be consumed reliably and securely by the customer, whilst being managed and quality assured by the Service Provider. The key distinguishing factor for the Home Gateway, as compared with the modem / router, is that it is 'managed' by the operator who also provides support for value added services. The Home Gateway is the device offering secure broadband connectivity to the home and delivering services to the home environment with guaranteed service levels. It is the device that makes the home part of the broadband network.

Requirements

The next generation of services has therefore created the new requirements for the Home Gateway to fulfill:

- Providing a remote management service for the home gateway & the devices beyond it,
- Allowing the right device or application to connect to the right service platform with the right service class / Quality of Service,
- Acting as a proxy for those devices in the home that are not capable to communicate over the broadband network and thus hiding the complexities of the home network from the broadband network and visa versa. This class of devices includes legacy telephones and consumer electronics.
- Facilitating secure access to home based services and devices from authorized friends, service providers and families from remote locations.
- Recognizing and potentially uniting devices capabilities and service offerings to create a better integrated home environment and blended services.
- Personalizing user experience from any terminal

Role of the Home Gateway Initiative

For these requirements to be met, a common set of requirements for the Home Gateway and the surrounding eco-system must be defined. Where multiple solutions are offered for the same problem, it is often necessary to choose the 'best-of-breed' between these solutions in alignment with the roadmaps of the member operators. The Home Gateway Initiative is achieving this with industry support targeting the right cost levels in order to allow an efficient spread of new services.

The Home Gateway Initiative works as much as possible on an access agnostic Home Gateway to offer managed services. Initially the following access network technologies are envisioned: xDSL, Ethernet and fiber based technologies. Home networking technologies include Ethernet, WiFi, DECT and support to Power Line Telecommunications, twisted pair cabling and Plastic Optical Fibre. Some of the service platforms that are supported include SIP, IMS, and DLNA /UPnP.