PROJECT RESULTS

CA110 | Advanced STB delivers 'Smart Home' functionality and flexibility
[AppsGate]

The AppsGate project draws on the broad expertise and experience of prominent European actors for the purpose of developing and demonstrating advanced set-top boxes (STBs). These are primary, point-of-entry devices that offer homes a variety of digital applications targeted typically at residential automation, energy management and healthcare. These are integrated seamlessly with legacy STB services, and delivered in a flexible, user-friendly fashion, thanks to an innovative residential gateway.

AppsGate was conceived at a time when service and content providers and technology companies were keen on enhancing their offerings to the residential consumer. There were also other drivers at the time. Set-top boxes (STBs), the primary point of entry of services into the home, were capable of a lot more than media services. Thanks to their (affordable) computing power and functionality, as well as, the availability of open-software frameworks and connectivity standards, a new world of integrated home services could be created.

The project consortium, comprising prominent European electronic chip suppliers, consumer electronics OEMs (original equipment manufacturers) and service providers, were charged with developing and demonstrating advanced STBs and related products that support such features as, home automation, energy management and healthcare applications, and which seamlessly integrate with legacy STB services.

Stacking the deck

Project objectives were to develop, validate and deliver the three 'pillars' of the AppsGate platform: multimedia home gateways; Android STPs; and smart home solutions. There were challenges right at the start of the project, when the consortium quickly realised that no single software framework was available to address all project demands and requirements. A software stack was therefore devised to provide the most appropriate solution for broadcast, broadband and the smart home, at the expense of some integration complexity.

The project encountered several problems which it successfully resolved as follows:

— Broadcasting: solved using STB 'middleware' (a general term for software that serves to bridge already existing computer programs), designed to provide the best quality TV services by using multimedia hardware features embedded into STB chips;

— Broadband: handled by the Android operating system which provides instant access to countless apps and over-the-top content (OTT)

services, and which offers a framework for monetising new ones;

— Smart home: posed a unique set of challenges. The system had to be capable of identifying new services, adapt to devices coming and going, manage diverse communication protocols, and exchange information and services. In the absence of any widely adopted standard, AppsGate took two complementary approaches based on technologies available from the consortium partners. The first one was designed around the message bus; and the second approach implemented a service broker using an 'application abstract machine' (ApAM).

— End-to-end security and data privacy: handled using technology developed to protect premium content in STBs;

— Usability: considered early on because it drives system acceptance. Natural language was, for instance, deployed by end-users for specifying home automation scenarios;

— Integration of a deep technology stack with a large number of interfaces: addressed using 'clusters' of experienced and expert project partners formed around each hardware platform. This concept of a 'collaboration cluster' proved very effective by making interactions simpler. It also enabled tighter integration of partner technologies than initially planned, and sparked new ideas that were readily implemented.

All deliverables were on time and the goal of bringing an open platform that could deliver new home services was achieved, given the wide spectrum covered by the applications actually demonstrated.

AppsGate is technically elegant for several reasons. By leveraging the multimedia strengths of the STB, it enables home services to be seamlessly integrated and accessible from a single, unified interface, thus offering convenience, and reducing the costs of new services by sharing hardware and broadband connection. And speed is of the essence. An open platform will deal with a fast-changing,

dynamic market where operators and service providers must deploy new services quickly to lure new customers and counter competition.

Furthermore, extensibility allows users to install services and devices gradually, starting with a basic configuration and later extending it as experience and confidence grows. And not forgetting the end-user, key to the adoption of advanced home services is an intuitive, contextual interface suited to all user types, especially the less technology-literate, elderly and physically impaired.

Heading for the marketplace

The first products based on AppsGate technologies have already reached the market. The most notable of these is the Cube S of Canal+ developed by Technicolor around ST's system-on-chip; followed by more Android STBs from Technicolor and Pace. ST has also secured customers for the cable gateway bundled with NXP's Full-spectrum Transceiver. Furthermore, 4MOD is shipping the BLE remote control and the 6LoWPAN is under evaluation with huge volume prospects.

In addition, Simon Tech unveiled a new line-up of Z-Wave products; ARD, Immotronic, SoftKinetic and VSN made use of their project expertise to strengthen their product roadmap. And AppsGate's Smart Home, installed in INRIA's Rhône-Alpes living lab, is being used for further research.

Everyone's a winner

Far-reaching, AppsGate will impact end-users and industry, together with society in general. Not far-fetched, however, it could easily provide effective support to the European effort to handle an ageing population by controlling healthcare costs, improving energy usage and providing high-quality interactive entertainment to every home.

There are also significant benefits to a wide range of stakeholders. End-users are expected to be the main recipients of AppsGate services. These services will bring to many an opportunity to access information and to use the Internet for a wide variety of activities. It may even entice Europeans without an internet connection today to acquire one, thus helping to further bridge the digital divide. And service providers can offer multiple services, such as home control/monitoring, without using incremental capital.

And there is more. Medical care-providers can offer high-quality care to an increasing number of patients using limited financial and human resources. Furthermore, moving patient care from the hospital to the home is expected to result in cost-reduction and improved quality of life. On the electronics side, AppsGate will allow European chip suppliers to stay at the forefront of integration, with nearly one billion transistors in a single system-on-chip (SOC), and their capability to deliver a complete and compact solution comprising a system-in-package (SIP), software stack and reference board.

There are also other benefits. Networking technologies, for example, provide full home-coverage with no additional wiring; the number of 'boxes' is reduced along with their complexity; and content in many formats and from multiple sources is processed through a single, consolidated and adaptive interface. This convergence process is creating opportunities for European industry; but what's more, new applications will drive consumer behaviour, which in turn will generate new revenue streams. Certainly a winning solution.