



PROJECT RESULTS

Creating a validated architecture

for the multimedia Internet chain of the future



The growth of the Internet has triggered convergence with broadcast media. As a result, broadcast services will soon be offered via the Net and Internet services will be integrated into traditional broadcast services. For either to be successful an integral end-to-end approach is essential and versatile terminals are needed to take full advantage of new multimedia capabilities.

There are a number of alternative, complementary approaches but, as yet, no single technological roadmap for the convergence of Internet and broadcasting. We're likely to see hybrid networks covering various technologies for delivery of multimedia content, which is why the BRIC project

network and products that can co-exist and co-operate to form the multimedia Internet chain of the future.

A solution for a new, dynamic market

Interactive Internet services are supported by cable, ADSL and VDSL and the use of these network access technologies is growing rapidly, opening the way for new service offers such as video over IP. Broadcasters, whatever transport medium they use, are also seriously considering the offering Internet services in order to stay competitive.

None of these markets can become profitable without good security. Copyright protection is being developed by a number of industries and research labs, but the main result of the BRIC project – a validated architecture – is a key requirement. This result therefore secures the competitive power of several sectors of European industry including the broadcasting industry and equipment vendors. By focusing on end-to-end system definition, BRIC has produced technologies that make possible secure access to both digital broadcast and Internet services from the same network, with the



focused on two ways of combining Internet and broadcasting and on defining a common architecture. The result has been a set of technologies and system definitions that can be used to build a hybrid

same terminal, something that governments also want to ensure.

Protecting content

There's currently no way to completely control intellectual

BRIC (ITEA 99003)

Broadcast & Internet Convergence

Partners

- ENST
- Italtel
- Nextream
- RAI
- THALES Communications
- TILAB
- Westcast Systems

Countries involved

- France
- Italy

Start of the project

October 1999

End of the project

June 2002



PROJECT RESULTS

property rights and the added value of multimedia enhances the need for such rights. In the most advanced scenarios (hyper-distribution architectures) an end client can even trade content again. This new type of delivery introduces security features that are not handled by current conditional access schemes.



Secure access to services

To guarantee profitability content providers also require secure access. The solutions that are emerging will have a profound impact on the whole system architecture and in particular on the end-user terminal. The BRIC project has studied this topic in depth and implemented solutions that help to define and validate internationally agreed specifications.

An end-to-end system

BRIC has defined a software architecture that supports the delivery of Internet content via digital TV by allowing conversion from the standard Internet transport formats IP, UDP, and TCP to the digital TV transport format DVB. It includes validation of IP embedding in MPEG-2 transport streams, bandwidth optimisation techniques, and

support for interactive applications. BRIC results also permit the delivery of broadcast and multimedia content over Internet-based networks, having defined and validated an end-to-end chain for audio and video delivery, and by providing a protocol for the transport of MPEG-2 TS over IP-based networks, quality of service analysis, and a terminal software architecture based on a PC platform that provides audiovisual information with conventional TV quality. Finally, BRIC has defined a generic model and security infrastructure for content protection in IP-based network applications, controlling the use of rich multimedia content and ensuring the protection of intellectual property rights.

BRIC results have been used for several standardization proposals from bodies such as DDIC (DVB-DAVIC Interoperability Consortium), DVB-RC and DVB-CPT for encryption, key management, and binding of IPR to data streams.

Main applications

Several project partners are exploiting BRIC results:

- NEXTREAM's planned products MPEG-2 multiplexer and MPEG2 over IP encapsulator have been enriched by introducing new features resulting from BRIC
- WESTCAST has re-used BRIC results for its EPG & Video Content Management product (TVNAVIG software platform for video over IP)
- The prototypes produced by BRIC are also being used by partners who wish to experiment further with licensing methods, such as the Secure Kernel by TILAB, and the content protection features developed by THALES and RAI.



ITEA Office

Eindhoven University of
Technology Campus
Laplace Building 0.04
PO box 513
5600 MB Eindhoven
The Netherlands

Tel : +31 40 247 5590
Fax : +31 40 247 5595
Email : itea2@itea2.org
Web : www.itea2.org

ITEA - Information Technology for European Advancement - is an eight-year strategic pan-European programme for pre-competitive research and development in embedded and distributed software. Our work has major impact on government, academia and business.

ITEA was established in 1999 as a EUREKA strategic cluster programme. We support coordinated national funding submissions, providing the link between those who provide finance, technology and software engineering. We issue annual Calls for Projects, evaluate projects, and help bring research partners together. We are a prominent player in European software development with more than 5,000 person-years of R&D invested in the programme so far, and another 10,000 anticipated over the next five years.

ITEA-labelled projects build crucial middleware and prepare standards, laying the foundations for the next generation of products, systems, appliances and services. Our projects are industry-driven initiatives, involving complementary R&D from at least two companies in two countries. Our programme is open to partners from large industrial companies, small and medium-sized enterprises (SMEs) as well as public research institutes and universities.

