CELTIC N • E • W • S
Telecommunication Solutions

CONTENT

EDITORIAL

Celtic is in the process of selecting a new batch of exciting research projects, which will contribute to advancing end-to-end telecommunications in Europe. After closing the first call phase for new projects proposals in 2010, we have invited the originators of 19 out of 22 proposal outlines to submit a full project proposal.

For several of the accepted proposals, the applying consortia have been requested to enlarge their consortium and to seek additional expertise. There might be several opportunities for companies not yet included in a project consortium to join an already existing consortium.

You can find abstracts and contact details of all accepted project outlines in the project tables on the Celtic Website. In case of interest you may contact the project coordinator of the project in question or you may contact the Celtic Office.

The Celtic Core Group and the Public Authorities have decided, as in previous years, to offer in special, justified cases the additional opportunity for new-proposal consortia to submit a full project proposal without having to submit a prior project outline. However, those exceptional full project proposal submissions are only possible, if you have received an authorisation from the Core Group to do so. This might be possible for new project ideas that should be carried out without too much delay or for good and relevant proposals that were not accepted under national calls or EU calls like FP7-ICT Call 4.

Please contact the Celtic office not later than 30 September 2009, if you are interested. We would need a short proposal outline by this deadline.

From the future Celtic projects back to the present: in this issue we will present three successful projects, which have already finished or are already close to completion. In addition, we will give you an outlook on the envisaged follow-up cluster to Celtic, called Celtic-Plus.

I hope you will find some interesting information in this issue and would appreciate your comments and suggestions.

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Director Celtic Office

Celtic-Plus

Follow-up of Celtic under preparation

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In 2003, a group of European telecommunication companies created the Celtic EUREKA Cluster. Since then, many successful Celtic projects have been carried out, which generated high-quality R&D results in the area of end-to-end communications. Celtic's bottom-up approach has been instrumental in this success, allowing a good response to industry requirements. The involved telecommunications industry players have recognised the added value achieved within Celtic and are very motivated to put their efforts in the follow-up initiative Celtic-Plus, which will build on the Celtic achievements.

Celtic has become a well-established European ICT R&D programme that brings together industry and academia to perform market-oriented research. In addition to promoting the competitiveness of Europe's telecoms industry, the research done within Celtic also adds value to the European research landscape. As Celtic will run out in 2011, Celtic-Plus will maintain the end-to-end communications approach in order to reach an end-to-end system level that answers the main trends of the current market and to shape the trends of the future on an infrastructure and security level as well as for services and applications.

Celtic achievements

Celtic has established close links with many other major R&D initiatives in the field of communications, especially with several European Technology Platforms.

Celtic's achievements are highlighted by a number of successful projects in topical areas like new infrastructure solutions, new platforms for service delivery, and new multimedia services. More particularly, Celtic projects have addressed issues like fixed-mobile integration, ambient intelligence, network management, new security concepts, next generation optical networks, testing and improving standards, and Web 2.0 services.

The scope of Celtic-Plus

Celtic-Plus will naturally evolve around the same areas as Celtic, which embraces network infrastructure, security, services and applications. These areas will be organized under two main topics, "Get connected" and "While connected".

"Get connected" will tackle the infrastructure and connectivity aspects, with topics around network elements and infrastructures, like wireless, optics and energy efficiency; and around network architecture and connectivity, like networking and autonomic networks.

"While connected" will tackle the end-to-end services and applications, with topics around future end-to-end services, like digital citizen, digital home, digital enterprise, digital city, digital school, digital transports, e-health and games; around horizontal services, like security and identity; and around business aspects, like evolution of value networks in telecommunication business focus area, forecasting the changes in value networks and business models, and user modelling. New aspects related to the Future Internet will come soon into consideration. When it is becoming mature and comes closer to the market, there will be a significant role for Celtic-Plus to play to accelerate these deployments.

Celtic-Plus will also focus on standards support and directly contribute to the federation of European test beds in the context of FIRE, the Future Internet Research and Experimentation initiative, and Panlab, the emerging Pan-European Laboratory.

The format of Celtic-Plus

Celtic-Plus will remain primarily bottom-up driven but will also offer a combination of top-down approaches, in order to be compliant with the European and national R&D agendas without loosing the openness to spontaneous programme-compatible ideas.

Celtic-Plus aims to be the bridge for assuring an effective coordination and integration of European and national research activities in telecoms.

Furthermore, it is envisaged for Celtic-Plus to further streamline the process from the approval of project proposals towards the funding by the national authorities, in order to achieve an even better time to market.

Conclusion

The Celtic-Plus Initiative is essential for securing and enhancing the excellent position of the European telecommunications industry in market-oriented research, as enabled by Celtic. Due to its end-to-end communications projects, Celtic is today recognised as one of the main R&D programmes in European ICT, which brings together industry and academia players in a market-oriented bottom-up approach.

The high importance of the telecommunications sector for the European economy and the increasing technological challenges are the main drivers to carry out further market-oriented research in the field of end-to-end communications. Telecommunications is also a main driver for productivity increase and environmental neutrality in other domains like production technologies, power technologies, logistics, and many others.

TRAMMS

Traffic Measurements and Models in Multi-Service Networks

What are people actually doing on the Internet? How are they using the services and how does this evolve over time? These are some of the questions that are dealt with in the TRAMMS project.

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The Internet, as we know it today, is a diverse and heterogeneous network that has continuously evolved over the years and which has been shaped by many different actors with fundamentally different agendas.

Due to the complexity of the driving forces and the underlying technologies that constitute the Internet, it is increasingly important to monitor and analyse the traffic in the networks to identify user trends and traffic patterns, to recognise paradigm shifts, and to better understand the mechanisms of the Internet.

The main goal of the TRAMMS project is indeed to provide data and analysis for the above-mentioned purposes; the project measures and analyses IP traffic in access networks. The analysis strives to address several issues, like user behaviour, user characterisation, trend analysis, bottleneck analysis, routing events analysis, QoS estimation, and content popularity.

Approach

A major focus of the project and a particular strength is the direct access to measurements in several live access networks which are geographically distributed. In the networks, the measurement equipment is installed near the end-users in order to ensure a high level of detail for the analysis. Measurements are performed on the application level with state-of-the-art equipment in three live networks, a Swedish commercial network, a Spanish commercial network, and the RedIRIS Spanish university network.

Achievements

Extensive measurements have been performed in the above-mentioned networks, and results have been communicated in public deliverables and public newsletters. Some selected results from the Swedish and the Spanish commercial networks are presented below.

Looking at applications used in these networks, P2P (peer-to-peer) file sharing dominates the downlink traffic volume, except in the case of mobile customers.

The uplink traffic is even more dominated by P2P file sharing traffic, even for mobile users. Furthermore, the P2P paradigm is being increasingly used for delivery of content in a large variety of forms other than P2P file sharing, such as P2P TV or P2P music players. Taking this into account, access networks need to be designed with symmetric links in order to support current and emerging services.

The Internet landscape is changing rapidly, as the number of Internet users is continuously growing and new services are emerging. For example, comparing traffic in March 2008 and March 2009 in the Spanish commercial wireline network, we see that the traffic share of the two most popular applications, Bit Torrent and eDonkey, has decreased from 69 % to 52 %.

Application group	Swedish municipal network				Spanish commercial network			
	FTTH		DSL		Cable		Mobile	
	In	Out	In	Out	In	Out	In	Out
Web Browsing	7,1	0,4	20,6	2,6	12,1	1,9	60,5	20,7
P2P File Sharing	88,3	99,4	66,0	96,7	80,8	97,0	26,6	76,5
Multimedia streaming	4,7	0,2	13,4	0,6	7,0	1,2	13,0	2,8

Table: Volume share of application groups

Traffic share of some popular applications

Political decisions may have a large influence on Internet usage. In Sweden, the implementation of the Intellectual Property Rights Enforcement Directive (IPRED) has led to an immediate decrease of the Bit Torrent traffic by approximately half in the Fiber access part of the Swedish commercial network. The number of hosts using P2P file sharing applications in the same network and in the same period dropped by 19 %.

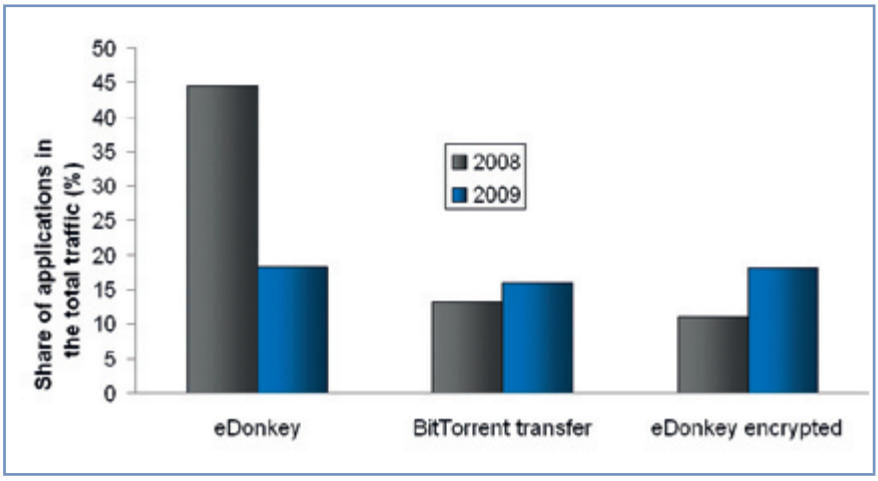

Figure: Filesharing

Conclusion

Given the recent debate concerning file sharing and the EC's telecommunications directive, the results of TRAMMS are of great importance for the future of the Internet. The project results underline that communication between the research community and the policy makers is an important key to the success of the European Future Internet discussions.

Further information about TRAMMS is available at *http://projects.celtic-initiative.org/tramms*

Managing the home network with EnComPAs2

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EnComPAs2 tackles the main challenges in the management of home and extended home network devices and services, making deployment and management processes easier for the network operator/ service provider and for the end-users. Another objective was the implementation of home and extended home services, including context awareness facilities. The invisibility of the technology is also a key aspect of the project. Finally, the project includes field trials in a real demonstrator to evaluate the platform and user acceptance.

Home network management platform

The proliferation of devices in the digital home context poses a number of challenges that makes it necessary to break with the current centralised management model of customer networks into a distributed one. Figure 1 shows that approach.

The first step was the introduction of remote management standards (TR-069, OMA-DM) into a management front-end layer in the remote management platform. New paradigms were also included in the model, such as autonomic computing, with the deployment of distributed intelligence in home networks that relieves the centralised systems from most of the management tasks. This was done using an OSGi framework in the residential gateway, also managed from the remote management platform.

A major issue was the encapsulation of all these complexities and technologies, aiming at protocol independence, providing the upper OSS (Operations Support System) with simpler service-level interfaces. Another important aspect was fixed-mobile convergence, which required also an integrated approach for orchestrated configuration of fixed and mobile devices. These challenges were tackled by means of an integration layer called Service Management Layer.

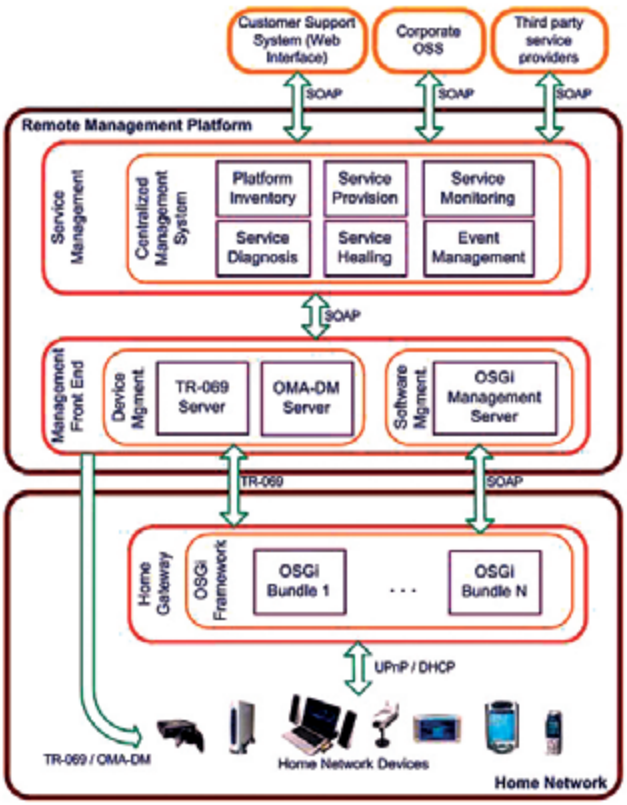

Figure 1: Architectur of the home network management platform

Services and applications

A set of scenarios based on the extended home network have been defined and implemented in order to demonstrate the capabilities of the EnComPAs2 platform.

The "provisioning of custom services" scenario enables the offering and easy deployment of customised services at the user's premises. The multimedia scenarios exploit the multimedia content, both personal and public, solving the interoperability problems between content servers and renderers, and supporting the creation of social networks. Figure 2 shows the graphical interface of the Home Manager that allows multimedia management in a home and extended

home environment. Finally, the voice scenarios promote the integration of the extended home and cellular networks by applying the IMS (IP Multimedia Subsystem) standard and context data (see figure 2).

Context Awareness

EnComPAs2 combines the next generation network core technology, implemented via IMS, with the extended home network, implemented via the residential gateway. The core network keeps the presence of the user – whether he/she is at home, outside home, at the car, etc. – and manages the context of the service. For example, a voice call targeting the user can be routed to the mobile device, the fixed-line at home, the PC or the car, depending on the presence. Session handover from one domain to another can take place based on the context.

This is performed by a Hybrid HSS, which is an IMS home subscriber server adapted to the hybrid environment, where multiple networks are being deployed – the mobile, the Wi-Fi/WiMAX and the residential network.

Figure 2. Home Manager screenshot

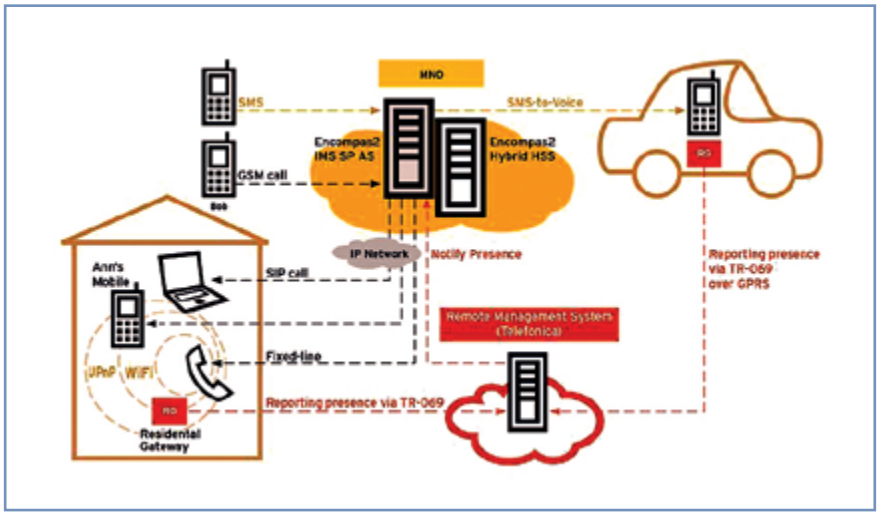

Figure 3: Mobile terminated-call routing scenario

Invisibility of technology

An important aspect for non-technical users to accept these new technologies is that they should not be aware of intensively using such technologies. Some constructive techniques have been designed in order to enable invisibility of technology at home. These techniques have been implemented in the demonstrator, where the field trials with users have been undertaken.

Conclusion

The EnComPAs2 platform facilitates the deployment and management of services and devices in the home network, both for the operator/provider and for the end-user. It also provides means for the applications to adapt to the user environment through context awareness techniques. Finally, it enables the invisibility of the technology for the end-users.

Further information about EnComPAs2 is available at *http://projects.celtic-initiative.org/encompas_2*

DRM Solution NG

Sim-based OMA DRM v2.0 Services over IMS

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The main goal of DRM Solution NG has been to set up innovative audio/video delivery mechanisms based on OMA DRM v2.0 and IMS standards. The objective of DRM Solution NG is creating a friendlier service for the distribution of right-protected contents. The project implemented a superdistribution hybrid service on a content delivery platform.

Approach

By improving the provider DRM interoperability, the users can download the content from the same source using different DRM systems without relying on a specific device or DRM implementation. This allows the content provider to offer the same content to more people, and it also allows the service provider to target new devices, both cases resulting in an expansion of the public range.

This service provides an online shop acting as a window between the user and both the content and rights providers, with a management of the user registration, the contents distribution and the rights concession.

Apart from expanding the public possibility, we also offer value-added services in order to attract the public with new and useful features. Those features include, among others, a personalised service and the possibility of streaming contents with a peer-to-peer superdistribution hybrid service. The user subscription can be personalised through analysing his tastes with his searches and the contents he usually consumes.

In the superdistribution hybrid service, users act both as consumers and producers while the content is being reproduced. It also allows the sharing and dissemination of multimedia resources both for fixed and mobile clients and networks. The service consists of real-time transmission (streaming) and media-content downloading over a semi-organized P2P network between different kinds of devices, but is primarily focused on mobile technologies (figure 1).

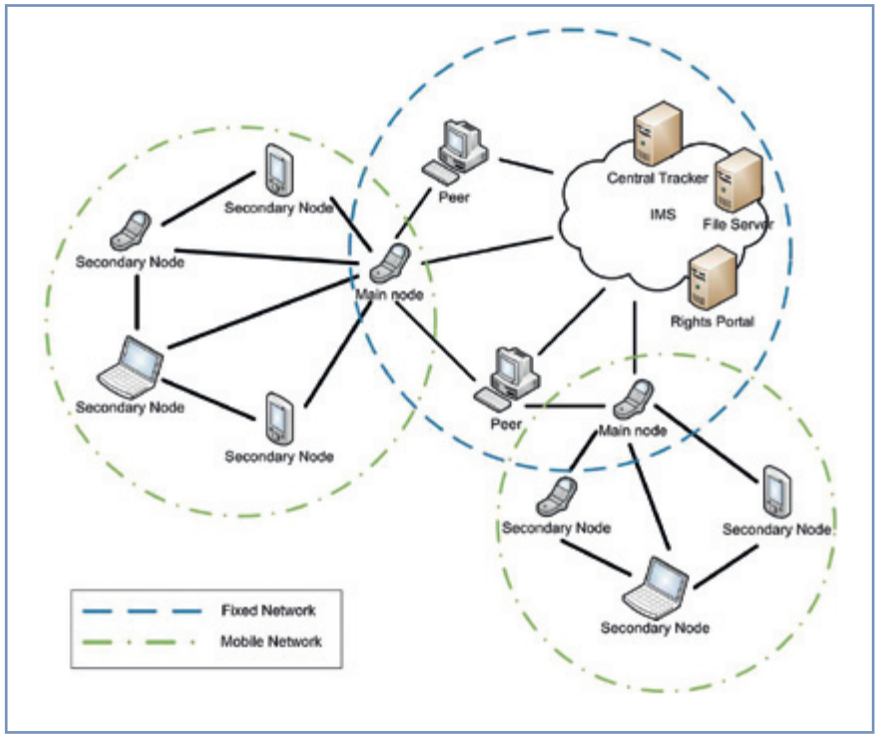

Figure 1: Architecture of superdistribution hybrid service

Achievements

A video-delivery platform has been built which enables the user to capture, store and send audiovisual content in different ways via an IP-based mobile telecommunication network. In addition, a player has also been implemented in both Windows and Windows Mobile environments. This player sends OMA DRM v2.0 protected content and is able to receive and render streaming content.

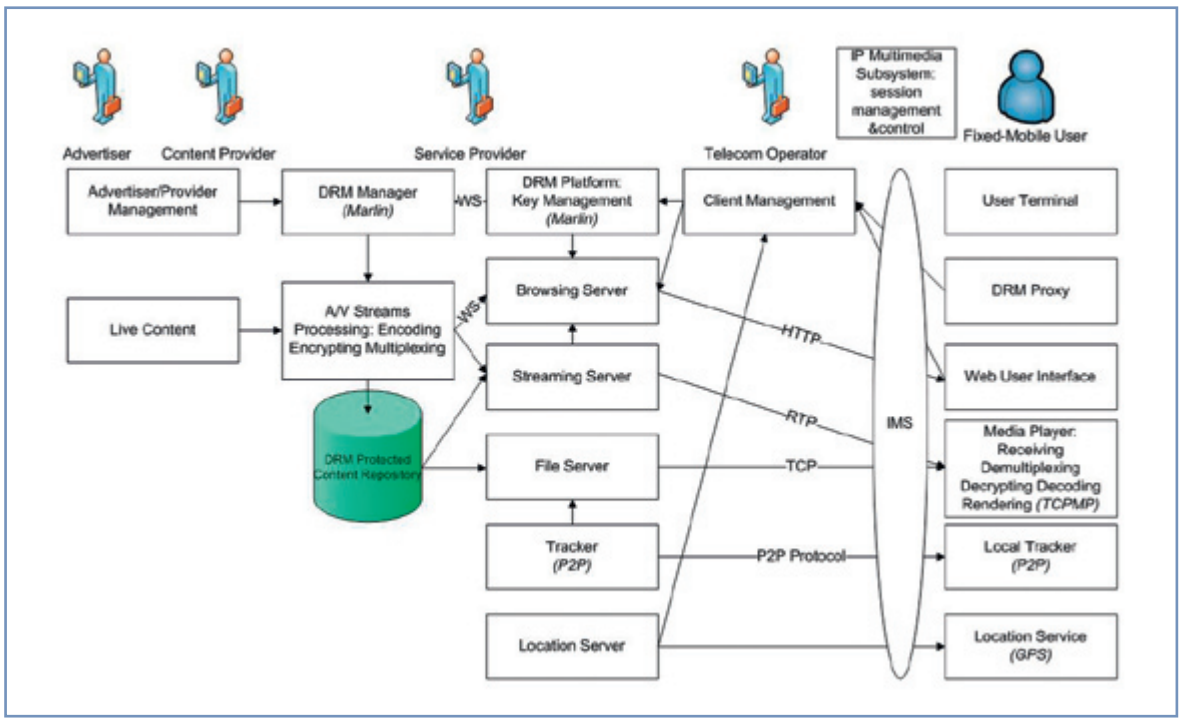

Figure 2: Video-delivery platform

The developed superdistribution service is based on a central tracker in which the contents are published and the distribution is realised over an IMS platform. It is also possible for other nodes to share their content through the Internet, using the information provided by the central tracker. The central tracker has the information of the IMS service petitions; this way it is possible to detect that some nodes are downloading the same content and that they can share some parts in order to save network load in the centralized IMS service.

Further information is available on the Web at *www.celtic-initiative.org/Projects/DRMSolutionNG/*

IMPRINT

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About Celtic

Celtic is a Eureka cluster, which initiates and runs privately and publicly funded R&D projects in the field of telecommunications. The cluster, which runs until 2011, is supported by most of the major European players in communication technologies. Celtic projects are focusing on telecoms networks, applications, and services looking at a complete system approach. The size of the Celtic budget is in the range of 1 billion euro. Celtic is open to any kind of project participants from all Eureka countries.