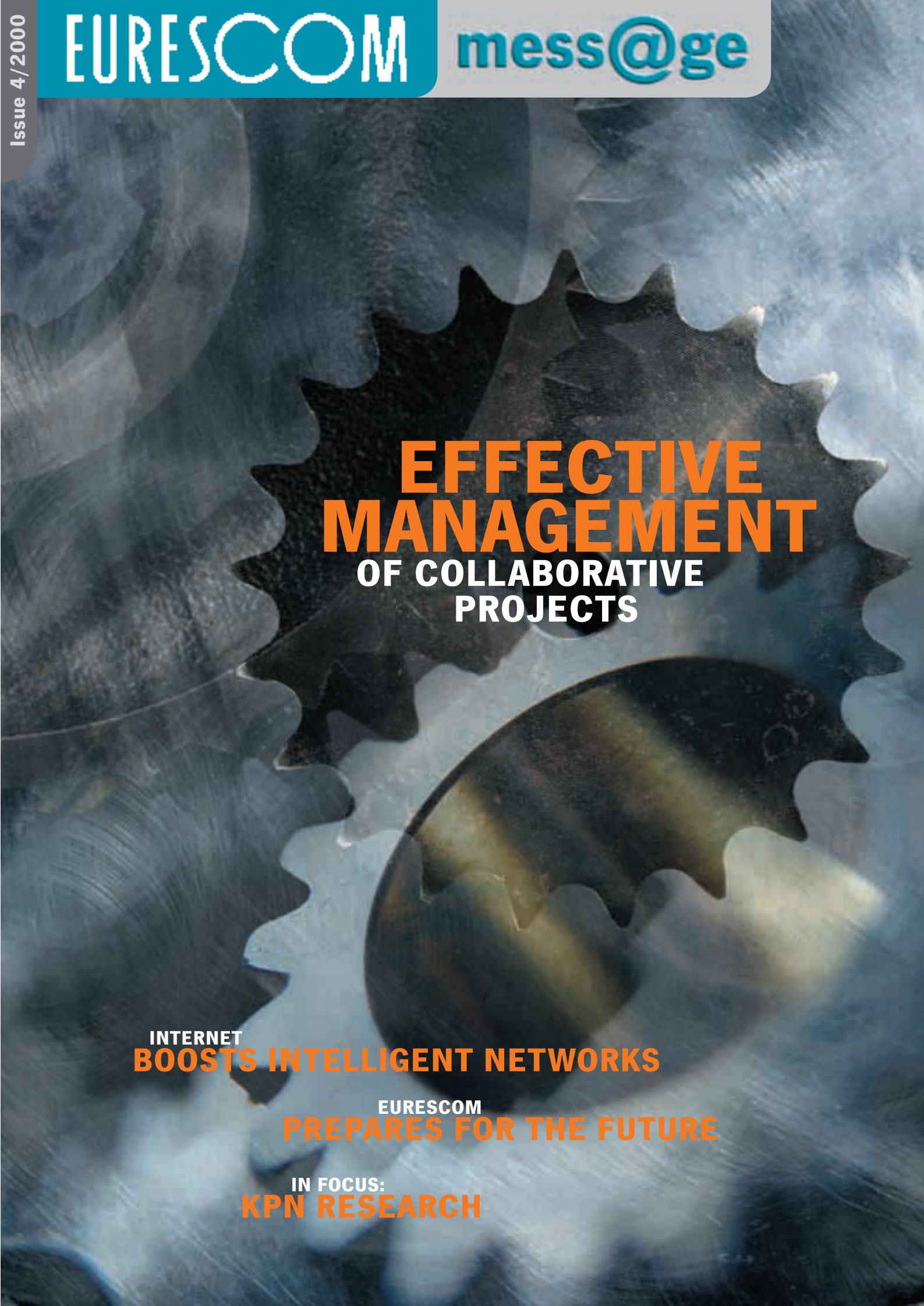
EURESCOM mess@ge
Issue 4/2000



EFFECTIVE MANAGEMENT
OF COLLABORATIVE PROJECTS

INTERNET
BOOSTS INTELLIGENT NETWORKS

EURESCOM
PREPARES FOR THE FUTURE

IN FOCUS:
KPN RESEARCH

mess@ge
reader poll 2000

Dear readers,

Thanks to all those who took their time to participate in our reader poll 2000. We are glad for having received a lot of constructive feedback that will help us in shaping mess@ge more and more to your information needs.

One of the positive key results is that the last issue 03/2000 met high acceptance both in content and in layout. 70 per cent of the readers think that the contents of the last issue is good or very good. Especially the tutorial (78 per cent good/very good) and the project reports (76 per cent) scored very highly. Accordingly, 63 per cent would like to see the Tutorial extended and 54 per cent want more project reports. 41 per cent judge the layout as very good, another 52 per cent as good.

We received a lot of very constructive proposals concerning the contents. One reader would like to read more about the emerging service providers, others more about next generation networks. Another interesting suggestion is to report about the use made of EURESCOM project results. It was also proposed that we include articles about R&D in non-EURESCOM companies and even other industries.

The majority, 56 per cent, of readers prefer to receive 4 issues a year, like it is now. An even larger majority, 82 per cent, is interested in an online edition of mess@ge. This is a bit contradicted by the fact that only 37 per cent read the PDF version of mess@ge, which is already downloadable from our Web site. Our interpretation is that most of the readers would be attracted by an online edition, if it offered added information value compared to the print edition. We are planning an extended online version of mess@ge for next year.

These are only some of the highlights from the results of the poll. If you want to know more about it, you can find the results in detail on our Web site under:
http://www.eurescom.de/public/publications/ms29/pollresult.htm

As a little thank you for participating we offered you
the opportunity to win some prizes.

And here are the winners:

1. Herbert Redl
2. Enrique Menduiña
3. Raquel García
4. Vera Skochova
5. Pedro A. Aranda Gutiérrez
6. Andreas Poyadjis
7. Gerhard Heinzel
8. Michal Forisek
9. Marco di Pasquale
10. Ana Magalhães

Congratulations to all winners!

They will receive their prizes,
bonus cheques from 'amazon' and audio CDs,
in the next days.

If you have any questions, please contact .....

EURESCOM

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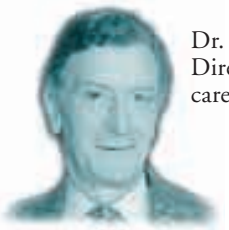
CREATING INNOVATION AND CHANGE



Dr. Claudio Carelli
Director of EURESCOM
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We live in an age of accelerating innovation; and this is especially true for telecommunications. It took about 20 years to develop ISDN from the idea to a mature product, 10 years for GSM, and UMTS will be on the marketplace only 5 years after its creation, if the forecasts become true.

The high competitive pressure in the telecommunications sector is the main driving force behind this rapid innovation today. On the other hand innovation is the only way to create new markets and, consequently, further opportunities to compete.

The time-to-market cycle cannot escape such an accelerating process; it also becomes shorter in the long run and R&D still plays a crucial role in generating innovation. The big challenge in order to create innovative solutions within a shorter and shorter time span, is then that R&D itself has to be innovative, both in project management as well as in finding the most suitable organisational structure. Researchers no longer live in an environment protected by a long-term vision, and they have to be aware of the fact that the only constant factor in their business is 'change'.

Shorter time-to-market cycle

Conservative approaches to innovation in networks and services can be extremely risky. The past 'network centric approach', not successful for the development of fixed networks, should by no means be used as a model for mobile networks. There is ample evidence for innovations that did not turn out a market success, like video on demand, DECT or Iridium mobile phones. If researchers want to be innovative, they have to think beyond the apparent technological options. Making this happen requires flexible structures and efficient project management.

Conservative approaches can be risky

EURESCOM is in the unique position to offer both; and in addition, the collaborative nature of EURESCOM allows considerable money savings for the individual participant members.

This issue of the EURESCOM mess@ge has devoted a whole part to the effective management of our projects.

Considering the fast-changing business environment, telecommunications companies cannot afford to be static. Currently, EURESCOM is in the process of proactively adapting to the future scenario. We are opening up our organisation for a stronger co-operation with telecommunications and IT vendors and suppliers. Moreover, we will establish procedures to speed up the process of setting up research projects. This will also imply a reorganisation of the business model and the way our virtual company works.

Creating change at EURESCOM

The most effective way to cope with change is to help create it. This is EURESCOM's basic working principle, and the core value of collaborative R&D is even stronger today than it was in 1991, when our institute was founded.

The next year will be a milestone for EURESCOM in two ways: firstly, we will celebrate our 10th anniversary in May, secondly, the evolutionary changes will culminate in the re-launching of EURESCOM as the leading institute for collaborative R&D, not only in Europe but on a global scale.

The next year will be an extremely exciting and challenging one, not only for EURESCOM, but also for the telecommunications business as a whole.

Until then, I wish all mess@ge readers peaceful Christmas holidays and a successful start into the year 2001, looked upon as the real beginning of the 21st century by some.

EDITORIAL REMARK

Dear readers,

In this issue we are reporting mainly on innovative projects and the latest technologies. Therefore we feel strongly obliged to implement useful innovations concerning mess@ge itself. Our aim is to increase the usefulness of our magazine to you by shaping the profile of our contents and layout. In this issue, we have made another step in this process. The layout has been changed to support a clear structure and to make the contents even more attractive. Your feedback on our reader poll gave us valuable information on how to develop mess@ge in the future. In order to address your needs and interests in the best possible way we will keep improving mess@ge next year as well. We hope you will like the changes we have made so far and that there is something interesting for you in this issue. We are looking forward to your comments.

We wish you a Merry Christmas and a Happy New Year.

Your mess@ge editorial team
message@eurescom.de

MESS@GE TO THE EDITOR

Dear editor,

Telcos today are still focussed on vertical applications too much: you want to deliver a complete solution to the end user, and in parallel it has to be a killer app for at least 30 per cent of your customers. This is not possible; voice was the last instance of this kind of development.

The real question of today is: Are operators willing to provide services where applications can be built upon? More or less the only service in this category available now is moving bits over the network. But there are many more candidates: the security infrastructure (the real 'killer' in my view), access to billing systems, location info, etc. Providing these as a foundation for third party applications means, of course, to give up a lot of control over your market.

But let's face it, you don't have a choice, anyhow: margins with traffic are going down and you will have to let others 'OEM' your technology. To quote George Heilmeier, Chairman Emeritus of Bellcore: "There's a universe of people out there who have a much better idea [...] of what key applications are, so why not give those folks the opportunity to realize them?" (Hint: Look here for a UMTS business case...)

Take WAP as an example: the idea was to provide an operator-independent platform for third party applications in GSM, which is what application providers want. Operators did not bring in supporting network services like security, so WAP invented their own security module (the WIM). On top of this, WAP followed the weird idea of re-coding content, so the WAP gateway had to break up end-to-end security. The result is: application providers run their own gateways within their trusted domains. The winners are the Nokias, Ericssons, etc. of a world that can now sell a lot more WAP gateways. What is left for telcos is traffic.

I-mode, on the other hand is a nice example of how to do it: I-mode is an application platform, it also offers key services like billing for third party applications, and, guess what: it works!

Let me finally say a word on the WebSIM: While being part of the project, I always stressed that it is not an application: it is a technology layer to build applications upon. This is hard to market telco-internally, because it contradicts the currently predominant thinking and it does so in the most radical way I could think of. But WebSIM could very well be a killer application for telcos, because it allows others to build killer applications!

Joachim Posegga
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Dear editor,

I am a regular reader of the mess@ge. During the last two years both the content and the layout has improved a lot. Particularly the information on new project results and of the recently started projects provides a good overview of what is going on at EURESCOM. I also like the focus on a cover theme.

The mess@ge still contains a lot of text to be read. Would it not be a good idea to guide the reader quickly through articles by marking the main issues, e.g. as short abstracts in front of the articles or as summaries at the end?

Kind regards
Reinhold Wehner,
Deutsche Telekom AG, T-Nova

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Imprint

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http://www.eurescom.de/public/publications/message.asp

WHERE ARE THE OTHER MOBILE BUDDIES?

NEW EURESCOM PROJECTS AND STUDIES

Introduction of open source in telecommunication (P1044)
This project will analyse the phenomenon of 'Open Source' from three aspects: the business, legal and technical aspect. It will evaluate the advantages and disadvantages of the introduction of open source 'products' in a telecommunications infrastructure and will attempt to answer the question: "What is the business model for telecom operators engaging in open source software?"

WOMBAT – Where are the Other Mobile Buddies in my Town? (P1045)
Mobile communication seems to be an intrinsic part of teenagers' lifestyles. Although location-based wireless services open a new dimension of mobile communications some technology constraints have to be considered. Otherwise it might prove difficult to achieve a similarly high acceptance for these emerging services as for SMS. The study deals with the question whether it is feasible to introduce location-based services and how the high requirements of the teenager market can be fulfilled.

FASHION – Flexible Automatic SwitcHed client Independent Optical Networks (P1012)
This project will support the recently started standardisation activity of ITU-T on automatic switched optical networks (ASON). As such, it considers the optical transport network (OTN) as a platform supporting different clients. In particular it will evaluate the switched approach to provision optical channels (OChs) to the different client layers. The project will provide a techno-economic comparison of optical networking solutions, including the comparison of traditional and agile OTNs. Finally it will outline the evolution path from present networks to ASON.

MINIT – Mobile and IP network integration testing (P1016)
This project will produce test suites for new interconnection scenarios also by co-operating with other industry players. It will develop formally specified test specifications for the identified services and networks, take actions towards the test tool suppliers, stimulate new developments and products based on our identified requirements and validate the test specifications with prototypes. Key results will be new or revised Abstract Test Suites for GSM phase 2+, UMTS, IP and GPRS network evolutions, and implementation guidelines and a prototype of Executable Test Suites.

For more short information on new EURESCOM projects and studies please visit our Web site under:
www.eurescom.de/public/projects/projecttable.htm *and*
www.eurescom.de/public/projects/projectsbrief1999.htm

GENERAL ASSEMBLY AGREES ON NEW COST SHARING

In their extraordinary General Assembly on 20 September at Frankfurt Airport the EURESCOM shareholders agreed on a new cost-sharing model. The basic change is the new definition of turnover classes as a basis for each shareholder's capital share. The new classes of contribution increase in steps of 500 million Euro of relevant turnover, starting with the lowest class of up to 500 million Euro. Compared to the old model the classes are more precise now, guaranteeing a fair distribution of costs between larger and smaller shareholders. In order to adapt the cost sharing to the fast changing telecom business, the classes of contribution will be revised annually. The latest revision was done for 2001 using 1999 turnover figures.

While EURESCOM remains a European company, companies from outside Europe will no longer be excluded from joining EURESCOM in principle.

Another major change decided by the General Assembly concerns the candidate shareholder status. The shareholders decided unanimously to abolish the two years candidate period. Thus, becoming EURESCOM shareholder will be even more attractive, because prospective shareholders immediately have full voting and access rights.

For Cyprus Telecom this did not make a difference, because they had already fulfilled all candidate requirements under the old rule. The General Assembly welcomed Cyprus Telecom officially as a full shareholder.

EURESCOM PREPARES FOR THE CHALLENGES OF A DYNAMIC FUTURE

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Telecommunications is the fastest changing sector of today's economy. The telecommunications business is unique in that it is a vital part of practically every other business. Just imagine a commercial venture trying to survive without communications. The challenge of this situation is that the telecommunications industry has to stay ahead of developments in every other industry field, anticipating their evolving communications needs and innovating and implementing new networks and services that can satisfy these needs.

The only telecommunications companies that will survive in this continuously changing environment are those who are reading the emerging technologies, understanding user and market trends, and developing imaginative solutions for this dynamic market.

EURESCOM is already changing to reflect the current business emphasis of the user/service driven world by implementing new approaches to collaborative research. We are changing the areas we address, the way we work and who we work with in order to increase the effectiveness of our community. We are not changing the identity of EURESCOM, as it will always be a network and service operators collaborative research facility. EURESCOM's goal is to maintain our position as the primary organisation for effective collaborative R&D in the field of telecommunications. In doing this we will increase its value to shareholders and new participants. In addition, by facilitating and specifying the next generation commercial services, we will underwrite the longer-term share value of the EURESCOM organisations.

New approaches to collaborative research

The work of EURESCOM

It has often been said that predicting the future is easy – it is just getting it right that is difficult! However, in the telecommunications marketplace today there are two orthogonal approaches that have both proven successful in increasing the activity in the network and consumption of services.

One is the traditional approach of looking at the services offered and thinking of how we can do it better, cheaper, faster while integrating new features all the time. The other is to allow engineers to speculate on totally new services and network technologies that will change the business models of telecommunications companies and their customers. Both approaches are interesting. The first approach is linked to existing business models and is understood as low risk incremental development. The GSM services were developed this way. The second approach entails a higher risk but has a potentially infinite reward if it proves successful. The emergence of the Internet is a good example of the second approach.

EURESCOM is on a strategy of having a good mix of near-term research and highly speculative work in our annual work programme.

Wider participation

We expect increased participation in EURECOM activities from new and existing operators from the European area and outside Europe. We have expanded our domain in response to the globalisation of the telecommunications business and now we are actively looking for other operators to join our community who can help with the development of innovative solutions and the implementation of these solutions in our networks. A main focus of EURESCOM will always be to preserve the interconnection of networks and the interoperation of services.

The other dimension where we know we will see an increase in participation in EURESCOM is in the role of suppliers and vendors. An effective response to high-pressure market situations, such as UMTS, is to develop mature relationships with the industry, who share many of our problems, as they try to produce products that satisfy our needs. Experience has shown that their collaboration with EURESCOM provides the synergy necessary to shorten the time to market of the services and network solutions developed by our projects. We will determine a form of membership for these key industry players to formalise and strengthen this relationship.

Closer collaboration with manufacturers and vendors

Fast establishment of innovative studies

As the market evolves problems will emerge preventing the exploitation of innovative services and solutions and these will need to be resolved as quickly as possible. Under the programme of short and sharp studies we have every year in EURESCOM, we can capture a problem statement and set-up a project to address the issue within a couple of weeks.

This efficient response, added to the involvement of network operators, service providers and manufacturers, is ideal to quickly develop solutions for burning issues and then to install these solutions in the appropriate industry forum or standards group.

Forum hosting at EURESCOM

When new concepts emerge in the telecommunications field they often need to be discussed openly by all the players in the industry in order to position the concept and the supporting technology correctly. This work is not mature enough to be formalised into a detailed project plan as we do not know what result to expect as we initiate the discussion. In these cases the ideal way to address the subject is to host an open forum on the subject and to invite all relevant parties to contribute to the discussion.

For EURESCOM the hosting of such fora is intended to generate more options and solutions for our shareholders and participants and they will be set up in response to their needs. Each forum will have a minimum of rules and legal structures in order to make them as fast, flexible and efficient as possible.

The existing excellent project support facilities at EURESCOM are capable of supporting several such fora and meetings and workshops may be hosted in Heidelberg.

Organisational changes in the EURESCOM headquarters

As we adapt our activities to meet the challenges of the future we are also reorganising our way of working in the EURESCOM organisation in Heidelberg. We have, like every business in the telecommunications field, examined every aspect of our cost base and made significant investments in having more effective and efficient business processes.

The most dramatic change we can expect with respect to EURESCOM headquarters in Heidelberg is that the basic business model of EURESCOM, how the operation is funded, is being redesigned to reflect the new focus of the network and service operators in the telecommunications industry.

The emerging new business model is converging towards an organisation that is funded in relation to the interest levels of the shareholders and the participants. Such an organisational model is dependent on the usefulness of its results and the satisfaction of the shareholders and participants for continuous operation.

Our future

So, we are changing every aspect of the organisation, its' participants, and the work we do in order to be more effective in the future. But what is our future? Several developments are clear to us: for instance that many more devices will communicate, the wireless and infrared will make interconnection easier, that individual users will have devices communicating on their behalf and that more of everyone's disposal income will be spent on advanced communication services.

What is not clear is how we get from here to there. This is the challenge EURESCOM is addressing and, in our new context, everyone in the telecommunications industry has a role to play in collaborating to make the future a reality. EURESCOM is one of the most effective structures for making this future attainable. We are collaborating to bring the future closer!

EFFECTIVE MANAGEMENT

OF COLLABORATIVE TELECOMMUNICATIONS PROJECTS

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EURESCOM – the truly virtual company

To the question "What is EURESCOM?" you may answer "The roughly 25 people in Heidelberg where we get project results and also this mess@ge from." Although this answer is not really wrong, it is only the tip of an iceberg.

A more complete answer would be that EURESCOM is a virtual company where technical work in the projects is being done by experts from the EURESCOM member companies, but also by other companies like manufacturers, if required and appropriate. The staff in the Heidelberg office is there to make sure the projects are set-up appropriately, managed efficiently, and that good results are available in time for dissemination to the right people in the right way.

Well established procedures take care of the standard cases

To give you some concrete figures: Currently EURESCOM has more than 40 projects and studies running in parallel. These projects or studies have a span of duration between 3 months and 2.5 years and contain between 10 and 300 man months worth of effort. Every year EURESCOM manages a project budget of roughly 2700 man months. In average an expert participating in a EURESCOM project spends 20 to 30 per cent of his time working for EURESCOM. This means that during any year more than 1000 experts are active in EURESCOM projects.

The days when telecommunications operators or service providers were limited to their national markets are definitely over. Globalisation has taken place on a large scale and made EURESCOM members also competitors. This does of course not mean that there should not be international collaborative research activities any more. It means that the collaborative projects have to focus on increasing the total market, not on distributing market shares. Our previous issue of the mess@ge showed how competitors can use EURESCOM results beneficially and how they can apply them to provide individual services to their customers.

'Co-opetition' – EURESCOM partners are also competitors

The EURESCOM Management Handbook

Managing international projects efficiently is not an easy task. EURESCOM has well established, ISO 9002 certified procedures for setting up, executing and closing its projects. In the 10 years of its existence, EURESCOM has gained a lot of experience which is the basis for the EURESCOM Management Handbook (MHB).

The MHB covers all standard cases of project management including defining projects, setting them up, legally contracting them, executing them, providing and disseminating results, ensuring the quality and closing them. The MHB consists of 11 parts defining and explaining all the key processes for successful project management. In addition it has a comprehensive template part which contains all necessary templates and forms. For more information check our Web site: www.eurescom.de/public/mhb/mhb.asp

Without repeating the content of the EURESCOM Management Handbook, we would like to illustrate the process to our readers by looking at the different roles in a typical EURESCOM project and at our quality process.

The different roles in a EURESCOM project have been tailored for effective and successful management and work in international multicultural projects.

The main roles are project leader, project supervisor, task and sub-task leaders, and editors.

The *project leader* has a high responsibility concerning the execution of the project. He/she is a representative of the EURESCOM project team and inter alia ensures that the team is working according to the agreed goals and objectives, makes sure that milestones, objectives and deadlines are met and is overall responsible for the content of the results.

The *project supervisor* – a representative of the EURESCOM office in Heidelberg – has an important role during the set-up phase of a project. He/she ensures that an efficient project team is built up and that the team develops the necessary team spirit. He/she supports the project leader and the team to plan the project in an optimal way, i.e. to structure it into appropriate tasks and sub-tasks, to find the fitting people for the different activities and to fix the milestones and types of results.

During the project, the project supervisor ensures that the team members are refunded according to the agreements and the EURESCOM rules. When a project is finished, he takes all necessary actions to close it properly. The project supervisor also has to deal with unexpected problems.

The *task and sub-task leaders* lead the technical work. They ensure that the involved partners provide their input within the agreed deadlines, co-ordinate them within their areas of responsibility and provide concise task and sub-task reports which can be used by the editors of the official project documents.

The *editors* are responsible for the written results. EURESCOM projects normally issue several reports which need to be well written for the audience they are targeted for. The most important skill of an editor is to be able to capture results in a comprehensible and interesting way. This is sometimes a problem for an international project with mainly technically oriented participants. The MHB provides a template for EURESCOM reports, and the EURESCOM office in Heidelberg offers help in editing and language checking.

The most important skill of an editor is to be able to capture results in a comprehensible way.

Reviews improve the quality

EURESCOM also has a review process where projects and the majority of the results are being reviewed by independent reviewers from member companies not participating in the reviewed project or from outside the EURESCOM community. There are different types of reviews:

- Initial reviews take place when a project starts and ensure that the goals are valid and achievable with the planned tasks and sub-tasks.
- Middle reviews, which take place in the middle of a project, check whether the project is on the right track, produces the promised results in the promised quality, and look at the value of the remaining part of the project.
- Deliverable reviews ensure the quality, of the documents capturing the project results.

EURESCOM project participants are scattered over several countries

The fact that the EURESCOM project participants are scattered over several countries is probably the most challenging issue.

Most of the work in EURESCOM is done remotely by the experts of the EURESCOM shareholders and other companies

In a typical EURESCOM project 20 to 40 experts from 6 to 10 different companies participate. In most cases the experts have not worked together before or do not even know each other before the project starts. Nevertheless to make sure that a project team builds up a team spirit is extremely important. EURESCOM achieves this through the role of the project supervisor who builds up this team spirit during the initial set-up and kick-off phases of a project.

At the beginning and during a project a lot of co-ordination is necessary. A project plan with milestones, deadlines and individual tasks needs to be agreed on, changes need to be co-ordinated and problems, which always occur during a project, need to be solved. During the lifetime of a project many documents need to be prepared, commented, amended and agreed on.

Eurescom has a very comprehensive way of working electronically

To achieve all this despite of the fact that the project team members are distributed all over Europe, EURESCOM has a very comprehensive way of working electronically. This includes e-mail exploder lists, FTP and Web servers, audio and video conferences. The article on page 10 describes the state-of-the-art tools EURESCOM is using for this purpose in more detail.

Although electronic tools help a great deal in managing international projects, sometimes the project team has to meet in a physical meeting.

Managing the exceptional cases

So far we have concentrated on 'standard' projects. It is important to have standard procedures for standard cases, and EURESCOM does have both the procedures and the experience. A significant additional value of EURESCOM is however becoming apparent in the successful management of the exceptional cases. Nearly every project meets exceptional cases where decisions need to be made and flexible handling is required. Here is where the roles of the project leader and project supervisor are paramount.

For some projects, a very flexible approach needs to be taken.

Just think about a project implementing a big test platform across Europe. An additional effort of managing the contracts with the suppliers and co-ordinating the usage is required.

Or take a project where requirements are described from a telco's point of view and vendors participate to implement and test prototypes right away. New ways of involving non-EURESCOM partners in the project team, including solving the intellectual property rights questions, are required.

The CASPIAN challenge

Another challenge comes from projects which cannot have defined goals at the beginning, because they are dealing with such a rapidly changing environment that the goals need to be adapted constantly.

When a project researches into the unknown, and when it is competing with university research world-wide, there is no point in trying to be too exact in describing what the project will find. Instead, the management style should be focused on creating an innovative environment where researchers can discuss with their peers on the one hand and on the other hand make sure that the world around these researchers can follow the progress.

The EURESCOM CASPIAN project (P926) is an example of such a project (see article on page 21). Active Networking research still has to converge into concrete goals, so some of the research in the project is purely speculative. Nevertheless, some parts have a more outspoken goal.

The management approach chosen in CASPIAN is to define a small number of 'experiments', each one with a small group of researchers investigating a defined issue. The experiments have been running for quite a long period; the existing six experiments have begun in March 2000 and are scheduled to finish in March 2001! A few new experiments have already been identified to succeed the current ones at that time.

Instead of spending too much time on writing traditional 'deliverables', the project participants focus on reporting their results in papers to international conferences. This serves the double purpose of advertising the project widely and also reaching the research community in academia.

The articles on pages 11-12 show some example cases of how flexible 'exceptions management' based on established procedures was put into action to successfully and effectively manage EURESCOM projects.

ELECTRONIC SUPPORT FOR
VIRTUAL PROJECTS

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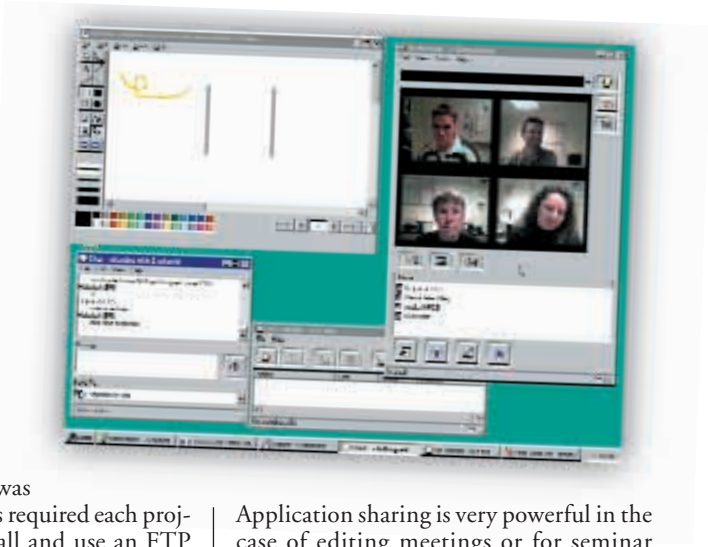

The EURESCOM Information & Communication Services (EICS) contribute a lot to the fact that EURESCOM has developed to the virtual company it is today. Services are offered to optimise and support collaborative work in projects and also to optimise the dissemination of results. If projects need customised solutions these can be offered as well. This summary will focus on those services, which support collaborative work in projects.

It is no surprise that the development of most of the services went hand in hand with the development and deployment of the Internet. In 1993 the EURESCOM E-mail system, which was based on X.400, was extended with an Internet E-mail gateway. From then on use of E-mail in projects grew phenomenally. After the introduction of mailing lists (also called *exploder lists*), the E-mail traffic increased to an average total of 1500 received and delivered E-mails per day. *E-mail combined with exploder lists* is still the most important means of project communication. Most of this E-mail communication is archived. For that purpose a News server is available which can be accessed with a news client or via the Web. The News server can also host message-based discussion forums. But the use of E-mail seems to perfectly suit the needs for message-based interaction since the *News server* is hardly used for this purpose.

The *FTP service*, which was introduced in 1994, allows projects to store all relevant documents in so-called project workspace directories. Until the Web service was introduced in 1995 this required each project participant to install and use an FTP client for file exchange. An FTP client is not so comfortable as a Web browser and nowadays most participants download the project files via the Web. The FTP client is now only needed for uploading files to the FTP server.

The *EURESCOM Web* server hosts project Web sites for each project. Projects can maintain their own set of pages by updating files in a corresponding 'Webspace' directory on the FTP server. Each project Web has a link to a *project management and reporting service*, which offers various budget reports, participant lists and allows the reporting of work summaries. Work summary data is committed to the database system after approval by the project supervisor.

Though it has improved a lot, the Internet can be slow from time to time. Therefore users can dial-in by modem via either PSTN or via the ISDN. Since the use of modems is prohibited in most Intranets, some shareholders mirror the content of the EURESCOM servers to a mirror server. The mirror server is installed in the shareholder's Intranet and therefore offers fastest access to all EURESCOM results. Currently *mirror servers* are installed in Matav, Telenor, Deutsche Telekom, France Télécom, eircom and Telefonica.

In April this year a H.323 based *audio and video conference system* was introduced which allows projects to connect by phone or by PC. PC users connect via a 2 B-channel ISDN, they can share applications and can see each other, if cameras are installed. Application sharing is very powerful in the case of editing meetings or for seminar preparation. The system is available around the clock for users with an EICS account. There is no need anymore for cumbersome booking procedures, and the quality is excellent. Since the introduction almost 180 phone conferences were held. Recently a pilot with 35 users was started to encourage the use of conferencing by PC. A technical description of the system was given in mess@ge issue 26, December 1999.

Participants in 'real' meetings at EURESCOM premises can connect their notebooks to the EURESCOM Intranet. This allows for almost paperless meetings. The participant should have a network card installed and preferably bring a LAN connection cable.

The use of streaming media via the Internet is getting increasingly important. A *streaming media server* is available at EURESCOM and allows projects to create streaming PowerPoint presentations which also include audio. In the near future it is envisaged that projects create their own streaming media presentation kits which will be hosted by EURESCOM. The system can also be used for real-time broadcasting of presentations. In that case shareholders can connect remotely to EURESCOM and virtually attend live seminar or workshop presentations.

To use the services a password is necessary and can be requested from the Helpdesk. (helpdesk@eurescom.de)

MANAGING DYNAMIC PROJECT STRUCTURES

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Technology evolution today is extremely fast, demanding a high degree of flexibility in order to adjust to this ever-changing environment. Especially in a technology area like middleware in which product updates and new products appear very rapidly, it is a prerequisite for the management of a project to quickly adapt to situations that could not have been envisaged in advance.

History

A few years back P715 on 'The EURESCOM Services Platform' was the first EURESCOM project that adopted a somewhat different approach to managing a project. P715 reserved a large part of its budget for experiments, which were not defined in advance. This approach proved to be very successful and efficient giving enough reason to its successor project – P910 on 'Technology assessment of middleware for telecommunications' – to adopt a similar but refined dynamic work model of running experiments.

Motivation

An experiment is a well-defined activity or work item with the same type of requirements as a Project Internal Result (PIR), concerning its budget spending and the documentation of its results. Experiments were introduced to allow for a more dynamic structure of the project.

An experiment is motivated by the project's need to define new activities and work items depending on the outcome of previous activities or work items. This allows the project to pick up new issues that could be explored within the defined scope of the project. This is quite attractive for a project like P910 that is running for two full years. In the middleware area, which is the focus for the P910 project, new techniques, systems and products are introduced every quarter. The experiment-oriented work model has thus enabled the project to explore new issues and ideas that have appeared during the lifetime of P910.

An experiment in P910 is a Project Internal Result. An experiment may be a study, a design or implementation activity, test and evaluation of system components or products, or production of white papers or presentations.

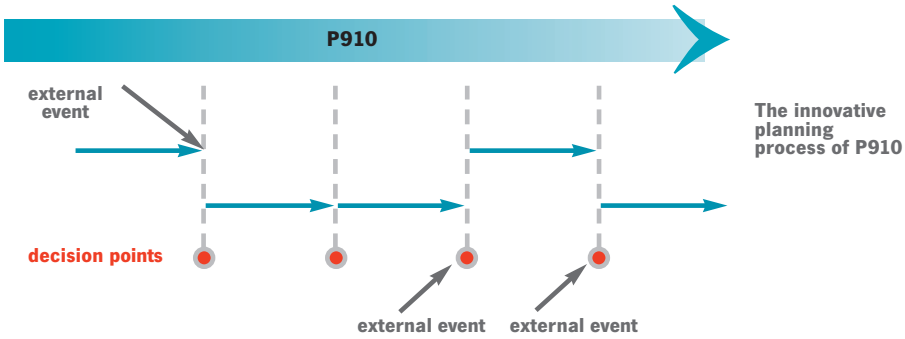
Keeping track

So far the P910 project has defined 75 experiments that are spread over 5 tasks, covering the main areas of interest in the project scope. The average size of an experiment is 45 man-days, and the work of an average experiment is shared between 3 partners.

How does the project manage to keep track of this high number of ongoing activities?

First of all, the process of proposing and approving experiments has been formalised and a template for proposing experiments has been defined. All project participants are invited to propose new experiments.

Secondly, an experiment proposal must address needed work within a task. The proposal is discussed within the task to ensure coherency with the other activities in the task.



Finally, once the task leader clears the proposal, the proposal is sent to the Project Management Committee (PMC) for approval. The PMC has scheduled meetings every 2 weeks. Thus, a proposal may be proposed and approved within a two weeks cycle, which is indeed very dynamic and flexible. The biweekly PMC meetings are organised as audio/video conferences, using the unique facilities of the EURESCOM headquarter's infrastructure. A detailed agenda is sent out 2-3 days before each meeting, and most meetings are completed within one hour. Minutes are written and distributed shortly after each meeting.

The dynamic structure has some clear advantages:

- Taking on new issues and ideas can be done efficiently.
- The participants of the project get very motivated by the fact that new things can be taken on at any time.
- The process of motivating the proposed work and having this approved by the PMC brings the project team and the PMC closer together.
- The biweekly meetings have helped in establishing closer ties between the PMC members.

Lessons learned

All of this does not come for free:

- Sufficient time is needed to keep track of on-going experiments, the allocation of the budget and spending at the experiment level.
- Likewise, sufficient time is needed to administrate the biweekly PMC meetings – by preparing the agenda and writing minutes.
- From time to time, it is difficult to keep track of all of the issues, and the bookkeeping is not yet properly assisted by the electronic reporting facility at EURESCOM.

Despite the price to pay, the work on keeping track of the experiments is manageable. The work introduced by the biweekly meetings also pays off in the sense that the PMC gets updated on the status of the on-going work at all times. This simplifies the overall project management and all participants receive a current update of the status every two weeks.

Overall, I feel that this dynamic scheme has worked out very well for the P910 project. It is very important to keep the formal process of proposing and approving experiments alive. It took some time before this got under way in the project, and I would recommend having some PIRs of fixed nature to start off with, as was the case with project P910. Once the ball got rolling, it was easy to motivate the participants to propose experiments. The project has been able to run the PMC meetings with a regular frequency of two-week intervals and to keep the meetings well focused and to the point, which also contributed to making this dynamic structure useful to the project.

Further Information is available on the EURESCOM Website under:
http://www.eurescom.de/public/projects/p900-series/p910/p910.htm

WORKING WITH VENDORS

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In early 1999, after receiving an invitation from the P908 set-up team, vendors of OSS interconnection gateway products from around the world were presented with the plans of project P908. Its objective was to evaluate how the market meets the needs of network operators/service providers in the OSS Interconnection area, specifically gateways for regulated services such as Carrier Pre-selection, Number Portability, and so on.

All vendors that followed the invitation expressed a strong interest in actively participating in the project, given a number of conditions to be negotiated during a feasibility study phase.

Organisation

The project was structured into two phases. The first phase was a feasibility study phase to scope the implementation phase, and to identify the critical areas that had to be addressed. The second phase was the execution of the project including the development of requirements and gateway testing.

In the first phase, nine gateway vendors were approached and invited to participate. At the end of the feasibility phase the number of vendors had reduced to three:

- Agilent (formerly Hewlett Packard)
- Global eXchange Services
- Telcordia Technologies

What characterised these vendors was a genuine commitment to the telecommunications sectors, and to developing and strengthening their presence in the European market place.

The project was operated along the normal project lines, and the vendors were integrated into the projects as if they were shareholders. Occasional, shareholder only teleconferences were needed solely for the purpose of concluding discussion on budget allocations, and to establish in a private way the shared objectives of the EURESCOM shareholders, such as the priorities for testing.

The vendor contribution

The dynamics of this implementation-based project were quite different from earlier EURESCOM OSS projects (e.g. P612 and P408) where the Service Providers developed their own prototypes.

The main differences were that shareholders focused on developing and documenting their requirements whilst:

- Vendors brought knowledge and experience from the US market- place;
- Vendors brought a product discipline to the work;
- Vendor products dramatically reduced the effort that Service Providers had to expend to get working prototypes for the project.

Learning points

Vendor involvement substantially reduced the development costs to the shareholders, and the project was reduced in duration by about 3-6 months compared to earlier testing projects.

This was due to the project leaving the specification phase for detailed test cases to the vendors. Nevertheless a substantial effort was needed between the shareholders to produce and finalise the set of gateway requirements.

The complexity of inter-operator processes and business models, makes the classical waterfall paradigm, where serial phases of requirements-specification-implementation were clearly distinct, no longer realistic and practicable.

The results of the project were immediately downstreamed to the target vendor community making it possible for EURESCOM shareholders to procure European solutions more quickly than the historical approach.

Furthermore, the results have been promoted in a EURESCOM workshop, the TeleManagement Forum, the European Telecom Platform and the Telcordia European Interconnection Forum.

The project

EURESCOM P908 project has investigated the challenges of interconnecting the OSS of different Service Providers using an OSS interconnection gateway. Commercial Gateway products from the participating vendors were evaluated, using a Carrier Pre-Selection case study.

P908 focused on experiments with OSS interconnection gateways in a laboratory environment through the use of a well-defined case study: Carrier Pre-Selection. The main objectives of the project were:

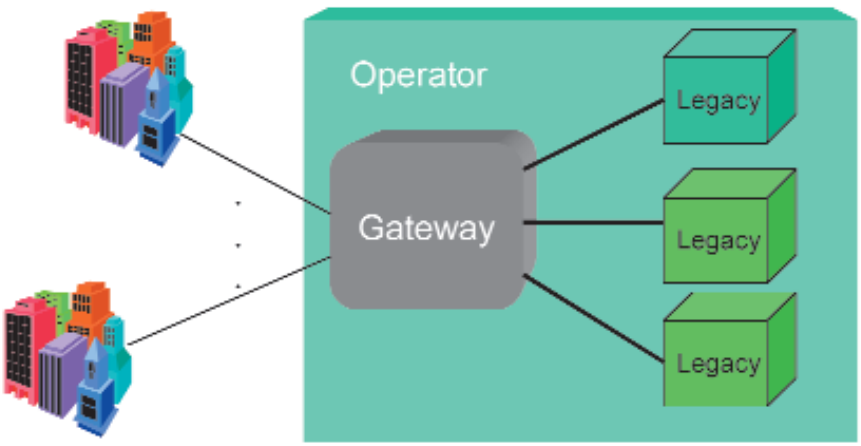
- To develop and verify gateway requirements and specifications for the application process case studies with the objective of converging on e-commerce solutions.
- To investigate the flexibility of gateways in an ever-changing environment.
- To evaluate the basic functionality of a gateway platform.
- To examine requirements and emerging technologies for the evolution of gateways to support future business and regulatory requirements.

Moreover the gateway provides a single point where security can be enforced, and an identifiable entity within a Service Provider that can establish trust relationships with other operators.

It also provides a tool to support the requirements imposed by regulators, such as QoS and SLA towards other operators, or authentication and anti-slamming towards end-customers. Where that is imposed by regulation, gateways can in fact interact, being accessed or monitored, with the Trusted Third Parties that manage the regulated services.

The result of the project has been a set of specifications and guidelines that support the complete life cycle of acquiring, deploying and operating an OSS interconnection gateway within a Service Provider. The involvement of the vendors confirmed carrier class commercially available solutions.

Further information is available on the EURESCOM Web site under:
http://www.eurescom.de/public/projects/p900-series/p908/p908.htm



Gateway solution to the OSS Interconnect requirement

KPN RESEARCH
AND EURESCOM

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With about 450 research staff members at its two locations, Leidschendam and Groningen, KPN Research produces innovations leading to services, products and processes for the various business units of KPN, as well as for a number of external parties. These innovations are based on advanced skills and know-how developed and maintained by KPN Research itself, in combination with skills and know-how accessed for KPN via third parties. In addition to innovations, KPN Research also provides strategic advice and support to operational processes within KPN. 70 per cent of R&D is conducted with the customers of KPN Research on a contract basis.

The expertise and experience of the organisation

The skills and know-how are developed by KPN Research specifically for applications in products, services and processes for these customers and also in markets in which KPN can operate now and in the future. In this connection, KPN Research now has an outpost in Silicon Valley which is not only concerned with technological developments, but also with the social, cultural and business economics aspects of the present and future use of ICT.

The goal of KPN Research is to contribute to boosting KPN's profits by generating more revenue on the basis of new ICT services and products and by reducing the costs of existing products and services by improving the processes. To this end, KPN Research focuses on network and IT infrastructures as well as on services for end users, with particular emphasis on mobile services, Internet services and IP technology.

How important is EURESCOM for KPN Research?

For international projects, KPN Research works according to the 'extended arm' principle. This means that, in consultation with the internal customer, some of the work might be carried out in the form of collaborative projects with third parties, if this is beneficial for all concerned. The same applies to building up skills and know-how.

This can take place in a EURESCOM context or in the Framework Programmes of the European Union.

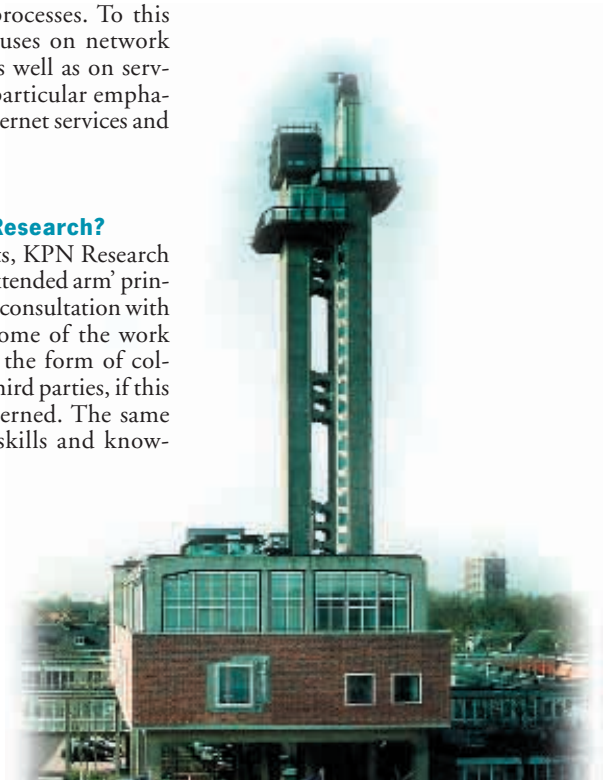
The projects fall within the scope of the work to be carried out as agreed with the customer, and also within the financial constraints.

The advantages for us in participating in EURESCOM projects are:

- 'More value for money', by sharing knowledge and experience with other operators.
- By focussing on 'collaborative technologies', every participating operator can create their own competitive advantage.
- Jointly compiled standards make it possible for an opening in the (European) market to be created more rapidly.
- Solutions can be sought for problems which are beyond the capability of individual operators.
- It provides a window on the ICT world and its players.
- The operators can establish a common standpoint vis-à-vis the European Commission and organisations which prepare standardisation.

The advantage of close co-operation with EURESCOM partners can easily be illustrated by asking people involved in recent projects, such as

- P715 which was providing and experimenting with a EURESCOM middleware platform based on OMG's CORBA and on TINA principles running on top of various hardware and software platforms or
- P1001 on Implementation and Test Suites for selected applications and services.



KPN Profile

KPN serves nine million fixed network lines in the Netherlands and is market leader in mobile telephony (with 4.2 million customers) and Internet services. KPNQwest provides IP/data services to companies and large-volume users in Europe.

All of KPN's international mobile communication activities have been assigned to a group company called KPN Mobile. The takeover of German operator E-Plus has elevated KPN Mobile to one of Europe's major mobile operators with 9.2 million customers. KPNQwest and KPN Mobile are serving to enhance KPN's image as a company driven by growth and internationalisation. Sixty per cent of the income generated by KPN is derived from IP/data activities services and mobile activities.

KPN's services are built on a dense fibre optic network that interconnects Dutch cities and also a growing number of European cities and business centres. In the Netherlands, KPN has a nationwide network that has been prepared for broadband applications with the help of ADSL and other new technologies. KPN installs hardware and lays cables as part of the service it delivers to customers. It also provides network and transmission capacity to other telecom operators.

KPN and the community

KPN has occupied a prominent place in Dutch society for many decades. The company has contributed substantially to the Dutch economy by creating employment opportunities and providing services to a large section of the community that use them intensively every day. In addition, KPN also contributes significantly to public revenues (annual tax payments total around NLG 3 billion). KPN is committed to being close to the community in every respect.

A company with such firm roots at the heart of the community has certain responsibilities to society as a whole. That is why KPN is actively involved in activities in different areas of public life in the Netherlands. (KPN Web site: www.kpn.com)

The EURESCOM Services Platform project P715

Without EURESCOM we would probably have come as far, but it would have cost us a lot more. In brief: EURESCOM should be seen in the light of know-how, time and money. Our participation in P715 arises from our decision to build up know-how in the field of middleware by participation in a EURESCOM context.

Why? If we had gone for it alone, it would have taken longer and/or cost more. The project involved relatively large-scale experiments with the emphasis on technology assessment, which is well suited to a collaborative approach.

The major network operators worked alongside one another within the project.

The relationships we built up with universities during the course of the project will continue to give good returns, even after the end of the project.

In view of the enormous breadth of technological developments, we have to carefully select the areas in which KPN Research wants to build up specific expertise and those in which we could build up or buy in the expertise jointly with others. We will increasingly have to deliver other areas of knowledge to KPN via other knowledge institutes.

Without EURESCOM, it would have taken us longer to identify these knowledge centres.

Implementation and test suites for selected applications and services – project P1001

Collaboration is a must, since it would otherwise not be possible to establish sound inter-telco agreements in the PKI (Public Key Infrastructure) area. We can build up our know-how more rapidly via such collaborative factors and at relatively low costs.

Participation offers us a good opportunity to share our opinions about possible strategies: how will the various future PKI services be positioned and how can they earn us money?

The inter-telco aspect will almost certainly lead to new services, e.g. WAP services that require security and that can be used from anywhere in Europe with the same level of security. Here as well, there are indirect benefits; the scale of the consortium means that suppliers are extremely interested in doing business with it.

In short, for KPN Research participation means a payback in the form of joint results worth a multiple of its efforts.

KPN research link:
www.research.kpn.com/research/flash/_site_eng/index.html

BRINGING BUSINESS ANYWHERE

TELECOM IT CONFERENCE 2000

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The EURESCOM IT for Telecommunications conference took place in Frankfurt, Germany from 11-12 October 2000 and attracted executive managers, developers, business professionals and venture capitalists from the telecommunication and information technology industries.

The conference offered a broad programme and all attendees had the opportunity to experience and understand new and emerging technologies before making critical development, enterprise purchasing or investment decisions.

Dr. Georg Schwegler, who recently changed from Head of Innovation Management to T-Venture, the Corporate Venture Capital Initiative of Deutsche Telekom AG, presented the challenges for technology transfer in E-business for Deutsche Telekom AG, the market leader in European telecommunications, in his keynote.

"There is a higher pressure for product, technology and business model innovation."
Dr. Georg Schwegler, T-Venture

The first day focused mainly on applications and infrastructure for mobile applications and e-commerce covering many themes including WAP, GSM security, standard interfaces for e-commerce platforms, enhanced middleware for scalable applications and support for automated distribution and configuration for distributed large scale applications.

At the panel discussion it became evident that security and standards are the keys for a successful telecommunications and IT infrastructure for e-business. Mr. Antti Siltanen from Siltanet, Finland, stated that "the Finnish Government introduced the Finnish Electronic Identification card, recognising it as an important part of information society."

"Anybody who owns a standard GSM phone is already enabled for mobile commerce as he carries a wireless smart card reader with him."
Roger Kehr, T-Nova GmbH

The second day focused on several aspects of service management, service provisioning as well as on multimedia content management, composition and delivery. In the second keynote Prof. Lambert Nieuwenhuis, head of the Middleware department in KPN Research, stressed the importance of QoS as an inherent part of the platform to support ICT service provisioning.

Finally Arno Puder from T-Nova North America presented the role of Open Source Middleware for e-commerce. "Peer review of software code, a feature of open source projects, enables quality, reliability, and safety for base technology such as platforms for e-commerce," he said.

The IT for Telecommunications Conference 2000 was jointly organised by EURESCOM and LogOn Technology Transfer and was sponsored by the Object Management Group (OMG).

All presentations are available on the EURESCOM Web server under www.eurescom.de/public/events/TelecomIT2000/TelecomIT2000ag.htm

The best speaker award goes to Mr. Roger Kehr from T-Nova for his presentation on 'The WebSIM: Integrating the GSM security infrastructure into the Internet'.

AIMS 2000 WORKSHOP ON APPLIED IP AND MULTIMEDIA SERVICES

OPTIMISTIC PERSPECTIVE

FOR IP AND MULTIMEDIA

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Which network technologies and multimedia services will succeed in the marketplace? This was one of the questions to be explored at the AIMS 2000 workshop on Applied IP and Multimedia Services which was held at EURESCOM in Heidelberg from 25 to 26 October. Around 60 people attended the event.

For four years now EURESCOM has been presenting the latest developments in broadband technology, multimedia- and IP- applications and services which request a high bandwidth at a controlled quality level in a combined workshop. While in the earlier AIMS workshops the ATM network technology covered a part of the presentations, the scope of the AIMS series for the year 2000 was changed. The network transport technology was no longer the main focus. This was shifted towards the suitability of IP technologies for high demanding multimedia services and the QoS aspects related to these.

In his opening speech Dr. Claudio Carrelli, Director of EURESCOM, questioned conservative approaches to innovation in networks and services. Taking the example of UMTS he pointed out the risks of being dogmatic about this new technology, because there is ample evidence for innovations like video on demand and Iridium mobile phones that failed to be a market success. He also made the audience aware of the strategic questions concerning the marketing of GPRS: "Is GPRS more than GSM or less than UMTS?" Analysing the conversion of telecommunications and broadcasting markets Dr. Carrelli sees a trend that "from a transport monopoly and a plurality of content we are moving to a monopoly of content with competitive transport". His general prediction for the future is optimistic: Mobile phones and devices will surpass consumer PCs by 2003; by 2004 more Europeans will own a mobile phone than a fixed line, and by 2005 there will be 1 billion mobile Internet users.

Innovation in networks and services

Mobile phones and devices will surpass consumer PCs by 2003

The focus of the workshop was on applied Internet and Web services and on IP network services, covering topics like next generation portals, multilingual Web sites, Always On services and Internet everywhere via IPv6. The second day concentrated on Quality of Service issues related to networks and applications. Most of the contributions from the attending high-profile experts were based on EURESCOM project results, others were based on IST and ETSI projects.

Ola Espvika (right) is honorized by David Kennedy for excellent project work

At the workshops it became obvious that, especially, the e2e related QoS issues, which are worked on in several EURESCOM and IST projects, should be harmonised in their approaches. It was agreed to discuss differences in interface definition and business models among these projects.

The high quality and the interesting mixture of the presentations were very well received by the audience, which was very satisfied with the workshop and its presented results.

Further Information:
http://www.eurescom.de/public/events/aims2000/aims2000ag.htm

HYBRID NETWORK

SERVICES & PRODUCTS 2000

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'Hybrid Network Services & Products 2000. Solutions for Next Generation Network Intelligence in an IP World' was the promising title of a promising EURESCOM workshop, which took place at the EURESCOM headquarters in Heidelberg on 15-16 November. Over 100 representatives from EURESCOM shareholders and from manufacturers witnessed interesting presentations on the convergence of Intelligent Networks (IN) and IP.

The EURESCOM projects P909 'Enabling Technologies for IN evolution and IN-Internet integration' (see article on page 18) and P916 'Supporting H.323 by IN' presented their solutions. This was complemented by vendors from industry including Lucent, Sun, Siemens, Ericsson and Telcordia, presenting their views on Next Generation Networks (NGN) as well as some information on their envisaged migration and product strategies towards NGN. Demonstrations of prototype implementations of Hybrid Network services from EURESCOM projects raised a lot of interest.

New business opportunites

The workshop gave ample evidence of how the convergence of different network technologies, under the umbrella of Network Intelligence, can boost business opportunities by making a wide range of advanced services available for customers. In order to achieve this, it is very important to build a smart architecture for Next Generation Networks. The presentations showed how this could be done.

Over the two days 19 speakers from major operators, vendors and suppliers presented innovative solutions and approaches for the design of Hybrid Network services and products. They discussed how heterogeneous networks like PSTN/IN and Internet can converge, how a joint service platform based on IN and Internet can be implemented, and how third party service providers can be given access to the network while preserving the network's integrity.

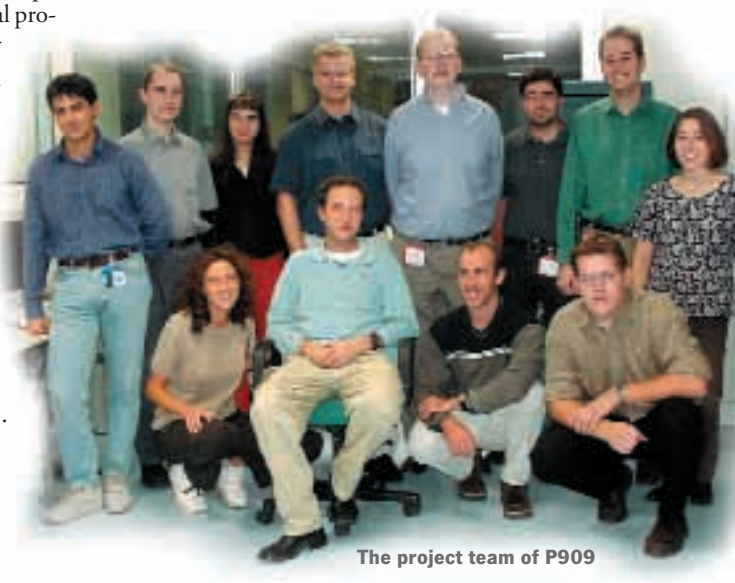
Service architecture

The main trend noticed at the workshop was a shift of emphasis from network architecture to service architecture. In line with that concept, the rationale for NGN should not simply be to get plain old telephony services working over IP networks but to provide "any to any" customised information and communication services over hybrid networks.

The potential of open APIs (Application Programming Interfaces) was highlighted in many presentations, as compared to the complexity of the traditional protocol inter-working approach. It emerged that the architecture and APIs of the Parlay Consortium seem to be the most promising solution available at the moment, particularly if some of the benefits of JAVA programming are included. It was announced during the workshop that EURESCOM plans to become a member of the Parlay Consortium in 2001.

The general message of the workshop is that opening up the current IN networks to IP will promote easier service design, quicker service development, faster service provisioning and result in more profitable services.

The presentations are available as streamed media files on the EURESCOM Web site under:
http://www.eurescom.de/public/events/pastevents.asp



The project team of P909

TECHNOLOGY ASSESSMENT OF MIDDLEWARE FOR TELECOMMUNICTIONS

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The objective of project P910 is to assess the value of middleware technology for telecommunication service providers.

With the dawning of a new era in the world of telecommunications, middleware is seen as the key to survival in an increasingly competitive marketplace. There are a number of potential benefits which middleware can provide:

- Cost reduction and decreased time to market.
- Improved business opportunities through interoperability.
- Opportunities to provide value-added services.
- Application development independent of underlying network technologies.
- New standards for open distributed computing.

These benefits are based on certain assumptions about the technology, and the question is: will the technology deliver the promised rewards? The mission of P910 is therefore to provide some answers, based not only on study and investigation, but also on practical experience and demonstration.

Adapting to market changes

Our message is that in the fast-moving telecoms market it is essential to adapt quickly to market changes, adding functionality and introducing new services. Middleware provides the means for rapid development and deployment of services, enabling new ways of doing business (e.g. mobile Internet access and mobile e-commerce). It can also allow more efficient operation by using load balancing techniques and more reliable operation by using replication techniques to enable fault-tolerant systems.

The project has addressed the following issues of middleware:

- Management of distributed applications
- Scalability
- Dependability
- Security

The Middleware demonstrator

In order to bring these issues together and to demonstrate the benefit of middleware to telecommunication applications, the project has defined a project demonstrator. This is an integration of work on management, scalability, dependability and security aspects of middleware based on an application framework designed and built within the project. The project has e-commerce as an application domain, as

this is seen as a high-growth area, and presents many opportunities for using middleware. The demonstrator consists of a number of components implemented at each Partner site, and interconnected via the public Internet.

The purpose of the demonstrator is to show how middleware performs in a real-life situation, and to demonstrate how various mechanisms can be applied on currently available technology to solve some key issues for telecommunication applications. Examples of this are:

- Management using interceptors – e.g. track major events at service run-time.
- Scalability and Load balancing – e.g. using replication of servers.
- Dependability – e.g. using a fault-tolerant naming service.
- Security mechanisms – e.g. to protect access to the servers.

The benefit of using middleware to examples such as those listed above is that middleware facilitates an easier way to achieve the desired effect – e.g. scalability and dependability. The project will highlight this by running some demonstration scenarios on the project demonstrator currently being implemented.

The P910 demonstrator encompasses a number of servers, which are based on middleware technology, to allow seamless interaction between them. The servers will host applications and services to enable a realistic demonstration of a middleware-based e-commerce system. The overall architecture of the demonstrator is shown in the figure below.

The different components

The following servers facilitate the e-commerce services:

- ePortal Server
- Access Server
- Web Server
- User Profile Server
- Naming Server

The ePortal provides a common log-on to the system. The ePortal maintains a database of the available e-commerce services and acts as the contact between the user and the services that the user is allowed access to. After a user has logged on, the ePortal will provide a list of currently active services available to that user.

The Access Server processes all incoming requests from clients (PC or WAP phone). For a PC client, this server connects the client to an available Web Server. For a WAP phone, it also converts the WAP requests to HTTP requests.

The User Profile Server (UPS) administers all user-specific information. It hides the implications of storing and retrieving data from the database, and responds to requests made by all service objects. A user will only need to provide his/her details once, at registration. When the user accesses a specific service (e.g. On-line Shopping), the service itself will acquire the required information from the UPS.

The Naming Server provides the CORBA global naming service for all the demonstrator components.

Highlights for the demonstration:

- The ePortal could potentially be a single point of failure in a real-life system. In the demonstrator, this server will be fault-tolerant using a 'hot-standby' that masks failures in the event that the master server fails.
- The Access Server could easily become a performance bottleneck in a real-life system. The demonstrator will show how middleware can be used to achieve load balancing and scalability.
- The Naming Server is an essential component of the demonstrator, and is thus a good candidate for demonstrating dependability. A fault-tolerant version of this server is provided.

Supporting e-commerce scenarios

The following servers support the e-commerce scenarios:

- On-line Shopping Server
- On-line Auction Server
- Travel Agent Server

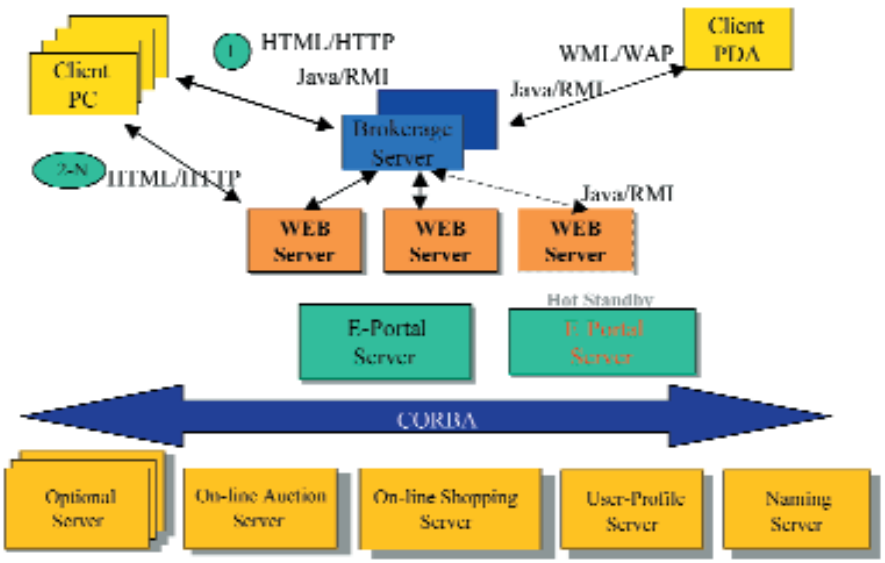
The On-line Shopping Server contains the business logic for an On-line Shopping service. The user can browse a range of products, and 'pay' for selected items – all with a minimal amount of input as the service retrieves the required information from the User Profile Server.

The On-line Auction Server offers a Dutch auction service. A mediator's clock counts the price down from the highest price to lower price offers. The first participant to make a bid halts the clock and the lot is sold to this participant. Thanks to IP multicast, a large number of dealers can join an auction session without experiencing communication bottlenecks for transfer of the price bid information. The IP multicast also demonstrates the scalability strength for this type of middleware.

The Travel Agent Server contains the business logic of a travel agent. The server will offer users the ability to order and pay for tickets, hotels and car rentals. The server can be accessed in multiple ways, and communicates with the User Profile Server. The server is stateless, and has access to a database that contains customer travel information as well as stored state information.

Much of the work in P910 has already been completed, and a successful mid-term workshop was held in Dublin in March 2000 to show off some of the achievements of the project. The workshop included an Open Day where vendors and others external to the project were invited to take part. This provided some valuable feedback which has allowed us to refine our plans for the final demonstrator, which will be put on show to the public early in 2001.

Visit our project results page:
http://www.eurescom.de/public/projectresults/P900-series/910d2.htm



Overall architecture for P910 demonstrator

INTERNET BOOSTS INTELLIGENT NETWORKS TOWARDS NEW SERVICES

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The convergence of PSTN, IP and mobile technologies under the Network Intelligence (NI) umbrella is moving the telecom industry towards a phase of unprecedented opportunities for service development, differentiation and customisation.

In today's marketplace, evolutionary trends in NI and the growth of the Internet have the potential to make a wide range of advanced services available to consumers. The evolution of the classical Intelligent Network towards IP-based approaches opens a wide area of innovation for the fast and flexible introduction of new services.

Enabling IN – Internet integration

The EURESCOM project P909 'Enabling Technologies for IN Evolution and IN-Internet Integration', has investigated solutions for IN-Internet convergence.

Next Generation Networks (NGN) was the buzz word last year. Different people imagine different things when they think of NGN. How can this concept be defined? NGN is the Application of Internet, IP and IT solutions to Telecom Services, including (but not only) the integration and sometimes the substitution of circuit switching with packet switching either for trunking or for access.

Surprisingly, usually people think of a mere porting of telecom protocols over an IP network (read H.323 protocol). Why should we reuse existing telecom solutions over an IP transport? The usual answer is to reduce cost of ownership. Is that really true? Is that a reason enough?

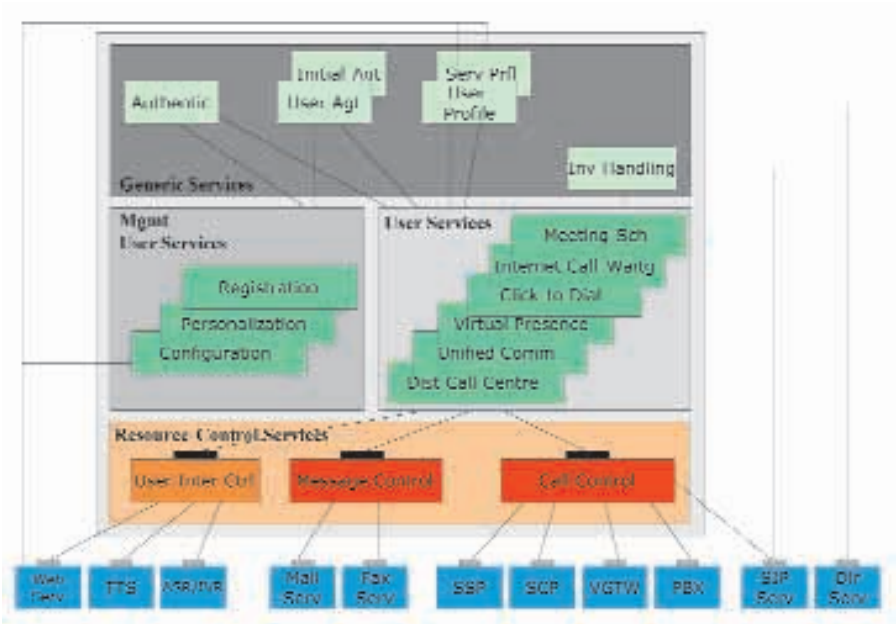
Indeed, the introduction of NGN opens a huge opportunity for Incumbent Telecom Operators: enabling the renewal in the service offering (meaning cash!).

Keeping the new services in mind

In this perspective, NGNs should enable the provisioning of new classes of services:

- Any-to-any ubiquitous communication services including unified messaging.
- Customer-centred and highly personalised services.
- Mixed voice/data services.
- E-call services (Web initiated call set-up).
- Integrated voice and data VPN.
- Advanced network call centre.
- Audio video conferencing.

A common feature of all these service classes is seamless service access (I can use my services no matter where I am, which terminal I am using, which access network I am attached to).



P909 Reference Architecture

Recipe for new hybrid services

The way of providing these new services is through:

- Open software architecture characterised by the distribution of functions over 'general purpose' IT servers and strongly based on 'middleware' (e.g., CORBA and text based protocols);
- Open service architecture that reuses the Legacy, products that promote the segmentation and distribution of functions, and components;
- Definition and reuse of open public APIs (Parlay, JAIN) for 3rd party service development and 3rd party use;
- Granular control over network and special resources (e.g. SSP, SCP, VoIP gateways, Gatekeepers, PABXs, SIP servers, Unified Messaging Servers, IVR etc.);
- Independence from equipment vendors;
- And the use of products when available.

Ingredients for new hybrid services

EURESCOM P909 defined a common Reference Architecture (see figure) which follows the above recipe. It consists of components that perform specific functions and run on top of a distributed platform (CORBA compliant). They are organised in 3 different layers, according to the layering principle: The Service layer, the Resource Control Services layer and the Resource layer. Key components of this architecture are:

- Call control: offers a Parlay 1.2 compliant API to the service layer for easy and fast service development; it interacts with underlying resources through adapters based on standard protocols (INAP for IN resources, Megaco/H.248 for Vocal Gateways). Call Control supports the hybrid call set-up (PC-Phone, Phone-PC and Phone-Phone) in a seamless way.
- Message Control: controls resources related to messaging services (e-mail server, IVR for Voice mail) to support unified messaging.
- Unified User profile: provides a single view of the user, his/her preferences and is easily manageable by IP and PSTN networks and terminals. It enables user ubiquity over heterogeneous networks and terminals. It supports the user's personalisation, configuration and registration.

Other generic components are located in the Generic Service layer. They are reusable components, which can perform service independent functionalities, such as authentication, invitation handling, etc.

Network resources are depicted in the bottom row of the picture. They are controlled through standard based API (small grey boxes) designed to ensure equipment vendor independence and the overall reusability of the architecture on several platforms.

Make use of all of the good things out there

In order to keep from 're-inventing the wheel', P909 has interacted with standard bodies and industry fora (Parlay, JAIN, IETF, INF, ETSI and others), Telco and IT vendors. On behalf of EURESCOM, P909 became member of JAIN in 1998 and it established strong relationships with the Parlay consortium. Quarterly workshops have been organised to share and exchange views with vendors. These have been carefully selected both in the traditional Telco arena (Lucent, Alcatel, Ericsson, Siemens), in the IT/Internet community (CISCO, SUN, HP, Oracle) and also more specifically in the area of IP and Telco integration (3COM, dynamicsoft, Bridgewater, Dialogic, Mediatrix, Clarent, Hughes Software, Telcordia).

Contacts with vendors have helped a lot in product selection, the evaluation of product maturity and in identifying and designing the missing bits.

If you need clear evidence – roll up your sleeves

P909 implemented some challenging services which profit from IN-Internet convergence such as Virtual Presence, Messaging, Internet Call Waiting, Click2dial, Meeting Scheduler and Distributed and Enhanced Call Centre. They have been demonstrated at the HSN 2000 workshop (Hybrid Services Networks and Products 2000, Heidelberg, November 2000). The source code and specifications for the implemented services and related components are included in the P909 CD-ROM (available free of charge upon request).

Conclusion

The research in EURESCOM P909 proved how the use of distributed platforms, open APIs, and object-oriented techniques are enabling factors to achieve interoperability between heterogeneous networks (which support a variety of protocols) and terminals. Opening up interfaces on top of current IN systems would facilitate service design, development and provisioning.

The lesson learned: The Internet will boost the IN spacecraft into the galaxy of advanced services.

For more information take a look at the P909 Web page:

http://www.eurescom.de/public/projects/P900-series/p909/P909.htm

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VENUS – VIRTUAL COLLABORATIVE ENVIRONMENT WITH NEXT GENERATION MULTIMEDIA SYSTEMS

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One of the long term goals of people-to-people, multimedia applications is to effectively use the network bandwidth to drive the geographical separation between users toward zero, at least insofar as the movement of information is concerned. As a consequence, the market of collaborative telecommunication applications has been growing continuously during the last decade.

The information shared in collaborative applications can be as diverse as documents, 2D audio-visual natural representations of participants, 3D synthetic objects, or complex virtual environments. The Venus project (EURESCOM project P922) aims at improving user friendliness, and providing more natural user interfaces for this kind of distributed communication systems.

Project objectives

The bit rate required by many applications to transmit complex information, such as interactive multimedia data, is dramatically decreasing (through technologies such as MPEG-4, H.323 and JPEG) while network bandwidth is continually increasing (through for example xDSL, GPRS, UMTS). Moreover, the Internet and the Web, exported to these environments, bring new paradigms, techniques and opportunities for collaborative applications. Based on these arguments, the objectives of Venus are to:

- Assess the newest available technologies and develop a new architecture for the integration of the more promising ones;
- Demonstrate and validate within a mock-up application the added value of the new functionalities offered by these technologies.

To achieve these goals, the following approaches have been adopted:

- Definition of the architecture and functionalities of certain innovative, collaborative applications;
- Development of the architecture that will support these applications;
- Real-time demonstration of a specific application from the set identified;
- Forecast and impact on standards, end-systems design and network infrastructure.

Figure 1: An MPEG-4 movie texture in a virtual conference room

Figure 2: A collaborative car design environment and showroom

Application functionalities

The functionalities presented below are identified as those that users expect from the next generation of collaborative applications. The functionalities can be divided into three classes:

- Virtual meeting room appearance: It is assumed that a 3D computer-generated environment is more comfortable and natural than a 2D scene, when users are communicating from remote locations.
- Representation of the participants: All participants will, in the very least, be represented by audio (i.e. their voice).
- Document and data sharing: During collaborative work, several kinds of digital media such as pictures and graphics, audio or video clips (as seen in Figure 1), and 3D models of objects (e.g. houses, buildings, cars, as seen in Figure 2) can be exchanged and manipulated.

Architecture overview

A simple and centralised architecture has been adopted in Venus. This architecture implies some complexity at the server side. Hence the server would be the bottleneck if many users were connected. Other, more distributed approaches are feasible (e.g. all the terminals sending their user information to all the other terminals).

Figure 3 gives a high-level view of the client-server architecture of collaborative applications.

Basically, each user terminal transmits the user information (e.g. camera, microphone, image data) to a Session Management Server (the thin arrows in Figure 3). The server gathers all the users' streaming information, and necessary server data, and incorporates them into a single and consistent scene. A compound stream of all these contributions is then generated and transmitted to all the users (represented by the thick arrows in Figure 3). On the user side, the terminal, in turn, gets the compound stream, performs the demultiplexing operation and the decoding and rendering of the streams.

The Venus technology platform is being developed within Telenor's Dovre environment (a distributed VR API), which is being extended by Telenor to support MPEG-4, through this project. Additionally AV codecs are being developed by FT, facial animation and stream delivery software is being developed by CSELT, Telefonica provides H.323 support, and Swisscom provides GUI and T.120 and development.

Conclusions

Venus proposes a framework for the development of innovative collaborative applications, augmented by multimedia data that should overcome some of the mentioned limitations. These applications are based on a virtual environment, where several types of objects and data can be manipulated, exchanged and shared between users communicating with each other from geographically distinct locations.

Some conclusions thus far, in the framework of multimedia and integrated services over packet networks are:

- MPEG-4 multimedia data over H.323, together with T.120 application sharing, enhances collaborative applications in both functionality and technology independence, while using network resources efficiently.
- Different traffic types with widely varying constraints can be integrated in the same application if appropriate mechanisms are provided.

Ongoing work in Venus involves: integrating elements of the MPEG-4 reference software: integrating H.323 with the MPEG-4 delivery framework (DMIF); integrating T.120 services; designing a GUI; creating sample content and developing a multi-user architecture for MPEG. Venus is due to end in December 2000. More information can be found at the official P922 project Web site: http://www.eurescom.de/Public/Projects/p900-series/P922/p922.htm.

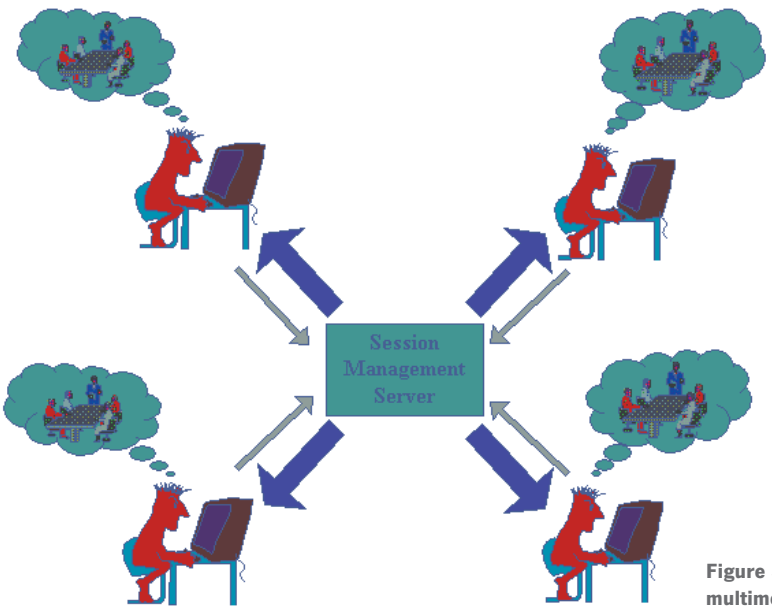

Figure 3: Client-server architecture for multimedia conferencing

AN INFRASTRUCTURE FOR DYNAMIC GLOBAL SERVICES

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Active networking aims to simplify the design and deployment of new services in a multi-service Internet. A key feature is to enable services to be designed and deployed by third parties, including some end-users. The technologies required are unproven and their full capabilities are not yet known. Ongoing international research is attempting to address these issues.

In the CASPIAN project (P926) we are adding to this research by investigating how active networking could be used in the context of a virtual private network (VPN) with a rich and dynamic range of value added services. The project is designing and building a practical demonstration that will enable us to discover the benefits and limitations of active networking in this context. The project is more research oriented, and more practically based than many Eurescom projects. As a result the management style of the project is also atypical.

Key Questions

The first phase of the project identified several key questions that CASPIAN will attempt to address by building a demonstration.

- How should routers be divided into managed virtual network overlays?
- How should services be defined, composed and added to the network?
- What service building blocks should be provided?
- How can interoperability between operators be ensured (for global reach)?

The questions are deliberately high level as they express aspirations. We would like the research to provide answers, but cannot be certain that sufficient research progress will be possible.

The demonstration will be based on the architecture (see figure) that was also agreed in the first phase.

An active router is a router that can be divided into a number of virtual network overlays with custom routing policies and forwarding protocols (such as reliable multicast). An active server is an application server on which custom service code can be dynamically loaded using requests embedded in the users data packets. The code server is the source of the dynamically loaded code. Examples of custom code include routines enabling processing associated with advanced caching, directories, filtering, or security.

In the current (second) phase we have divided the work into six experiments, each of which is expected to deliver a key part of a final integrated demonstration. Two of the experiments aim to provide example services (mail filters, and mobile VPN). The remaining four are building divisible routers, dynamic application servers, a service composition framework, and service deployment tools. Practical integration of the experiment results (third phase of project) begins in February 2001, and should be complete by September 2001.

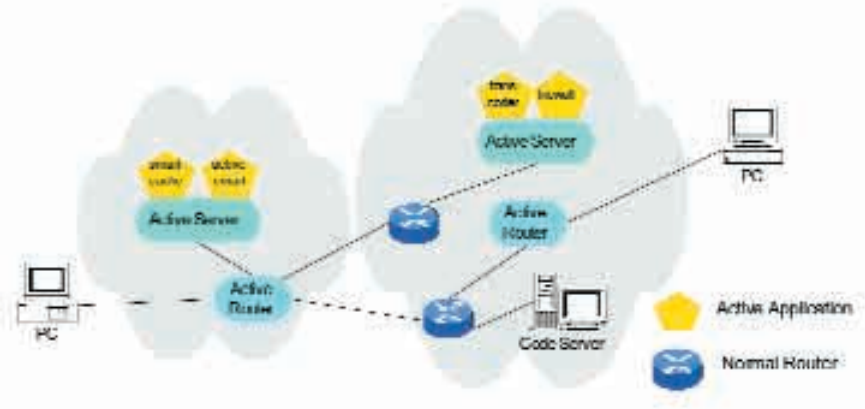
Active network technologies will prove very effective for enabling richly featured, dynamic private services

The project has only one formal deliverable – a summary report on what the demonstration proved, and what else we discovered. Interim results are being reported through publications at research conferences. We have had papers accepted at IWAN (2), SMARTNET, Policy2001, and at local symposia in Spain and the UK. In addition the basic architecture of the proposed demonstrator has been adopted by the Fifth framework project ANDROID, and contributions have been made to the IEEE P1520 standardisation project (covering programmable network interfaces). Unfortunately (due to the separation into a number of experiments) there is as yet no publication giving a complete view of the system we are building, but we are currently drafting a paper that will correct this. We also prepared an overview presentation for the AIMS workshop.

In the first two phases project meetings have been relatively infrequent (4 monthly) to allow partners time to make significant implementation progress. Meetings will be more frequent (2 monthly) during the integration phase.

Currently the CASPIAN project is making good progress. We believe that active network technologies will prove very effective for enabling richly featured, dynamic private services with a global reach. The lightweight management style we have adopted has enabled partners to focus on rapidly building appropriate implementation expertise and solving practical problems. Aiming to build a real demonstrator has ensured partners fully understand details, and has enhanced confidence in the validity of the project results, notably in the ANDROID project where vendors are participating. Concentrating efforts on original research that can be reported in conferences and journals has made the project quite influential even though work is still incomplete. We would recommend a similar approach be taken in other projects where external publication is possible.

Further information:
http://www.eurescom.de/public/projects/P900-Series/P926/P926.htm



OPEN SYSTEMS
OPEN STANDARDS?
OPEN SOURCE

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Ubiquitous computing environments which embrace a diversity of technologies introduce new levels of complexity. No single vendor can solve the problems which have to be faced because the nature of ubiquitous computing demands cross platform solutions. The central claim of this article is that this requires a paradigm shift from closed to open systems. When reasoning about open systems, different perspectives have to be considered. This article discusses technologies with respect to standards and software development in the context of open systems.

Technological perspective

Coping with the complexities of ubiquitous computing at a technical level requires to accept the heterogeneous nature of today's systems. Legacy applications need to be integrated and made accessible through handheld devices employing different technologies. It is neither feasible nor possible to prescribe a specific technology and for that reason any attempt to build a homogeneous system is bound to fail. This implies the promotion of technology through open standards and not by pushing proprietary implementations.

A popular solution which facilitates the development of distributed applications and which honours the de-facto heterogeneity is a middleware architecture. The term middleware derives from the fact that it is a software architecture which resides between the hardware and the application. A middleware spreads out like a table cloth within a heterogeneous environment, offering the same Application Programming Interface (API) at each location of the network, yet embracing different kinds of technologies. A popular specification of a middleware architecture is the Common Object Request Broker Architecture (see box 'The status quo of CORBA').

Software development perspective

With the increasing popularity of Linux, the term open source has become a synonym for a new software development process. The origin of open source is attributed to Richard Stallman, who opposed the growing trend of making Unix proprietary in the early eighties. He started the GNU (GNU's Not Unix) initiative with the intention to write a free Unix operating system, which eventually led into the Linux operating system.

The essence of open source is that the source code of a project is released to the public, allowing independent peer review. One often used definition of open source was given by Eric Raymond:

"Open source promotes software reliability and quality by supporting independent peer review and rapid evolution of source code. To be certified as open source, the license of a program must guarantee the right to read, redistribute, modify, and use it freely."

Independent peer review by other programmers throughout the Internet greatly enhances the quality of the code. This fact has also coined the phrase 'debugging is parallisable'. Open source projects have an impressive record when it comes to fixing problems. Programmers reporting a problem with an open source project often also contribute a software 'patch' which solves the problem. The turnaround time from identification to correction of a problem is usually much shorter than with any commercial product (hours/days vs. months).

Using the Web as a distribution channel, open source projects achieve a much shorter release cycle than commercial software. Commercial vendors have a rigorous and lengthy release cycle to assure the highest possible quality. But beta programs and quality assurance in the commercial world only expose a future product to a subset of all potential customers. The amount of testing is therefore limited. This distinction of beta test and final release is not made with open source projects where problems are usually fixed immediately once they are identified. Commercial product development leads to a slower innovation cycle compared to an open source project.

It is also argued that open source increases security and reliability because the blueprint of a programme is available through the source code. This allows independant inspection and decreases the possibility of 'unwanted features' such as Trojan Horses, trapdoors and the like being included and remaining undetected in programmes.

Especially with the increasing need for security with the rise of e-commerce applications, supporters of open source argue that the availability of source code to the general public makes it more difficult for governments to force vendors to include hidden trapdoors.

EURESCOM and open source

Open source has played a role in a number of past EURESCOM projects without explicitly recognising this fact, so far. As the 'open source software market' grows, almost coinciding with the growth of the Internet it has become a fact for most businesses. Even if one may not suspect a business model behind open source, an increasing number of small and big companies adopt this model in some way. EURESCOM recently started a study to analyse the phenomenon of 'open source' from three aspects: the business, legal and technical one. It will evaluate the advantages and disadvantages of the introduction of open source 'products' in a telecommunications infrastructure and will attempt to answer the question: "What is the business model for telecom operators engaging in open source software?"
For more information check the project Web page: http://www.eurescom.de/public/projects/p1000series/P1044/p1044.htm

The status quo of CORBA

The Common Object Request Broker Architecture (CORBA) describes the architecture of a middleware platform. It is issued by the Object Management Group (OMG), an international, non-profit organisation with over 800 information software vendors, software developers, and users. The goal of the OMG is the establishment of industry guidelines and object management specifications to provide a common framework for application development. There are several dozen vendors which provide CORBA technology for different market segments.

The current activities around the CORBA specification indicate a consolidation process. The various building blocks of the CORBA core have been standardised and work is now directed towards the consistency of the various parts. Additional work focuses on the services as well as different vertical domains. The much anticipated version 3.0 is expected to be issued later this year. It will include the CORBA Component Model (CCM), support for embedded and realtime systems, as well as an asynchronous messaging model amongst others.

One of the deficiencies of CORBA is the lack of compliance of existing products. This will become an issue once the need for interoperability between different vendors increases. The Open Group, established a branding process last year to test CORBA implementations for compliance to the standard. So far only three implementations have been branded; two of them being open source, which can lead to the assumption that CORBA compliance is not in the ORB vendors interest and that it can only be forced by their customers. A users group is currently being formed within the OMG to represent the concerns of the CORBA customers.

Another problem of the CORBA is that it is progressing faster than ORB vendors are willing or capable to update their products. The specification of the Portable Object Adapter (POA) for example was released two years ago and only now the major ORB vendors offer products with POA support. With the much more complex CCM it can be assumed that products with CCM support will not become available for a long time. This poses a threat for CORBA: the lack of products providing compliant implementations of CORBA will partition the CORBA market, undermining the very philosophy of CORBA to be a ubiquituous middleware. It has been suggested to use open source as a means to provide a reference implementation. MICO (http://www.mico.org) being an open source middleware project has the potential to serve as a reference implementation on top of which it is planned to raise funds for an open source implementation of the CCM. This reference implementation can serve as a platform for evaluating the CCM and may encourage the major ORB vendors to increase their efforts to deliver products. Those interested in this endeavor should contact me (arno.puder@telekom.de or apuder@pacbell.net).

ICANN – RULING THE INTERNET?

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Internet has always been a playground for people not believing in central organisations deciding things. For example, standardisation in IETF (Internet Engineering Task Force) does normally not mean that a single solution is decided upon. No, there may be several solutions available for a specific problem. However, each solution is well defined by an IETF document.

However, there are some things that cannot exist in several varieties on the Internet.

- One such thing, which immediately comes to mind, are the addresses. IP addresses need to be unique on the Internet. (On an Intranet you may use private addresses, if a Network Address Translation unit is placed as a gateway to the Internet).
- Another thing is the domain name structure. Chaos may result if anyone could come up with any kind of domain name. On the Internet, the so-called Top Level Domains (i.e. .com, .org) are fixed.
- Finally, a third group, which is not so evident to the layman, is the protocol numbering. Within an IP packet there is a code that identifies the type of packet (a TCP packet, a UDP packet, etc.). If these codes were not standardised, no IP stack could function!

ICANN at www.icann.org: "The Internet Corporation for Assigned Names and Numbers (ICANN) is the non-profit corporation that was formed to assume responsibility for the IP address space allocation, protocol parameter assignment, domain name system management, and root server system management functions previously performed under U.S. Government contract by IANA and other entities."

The organisation responsible for these things earlier was the IANA (Internet Assigned Numbers Authority). IANA was linked to the University of Southern California and funded by the US Government. When the contract for IANA expired, the US government felt that the ruling over the Internet should be a global affair, not only supported by the US. Also, since the Internet started to become more commercial, a university was perhaps not the best organisation to handle the issue.

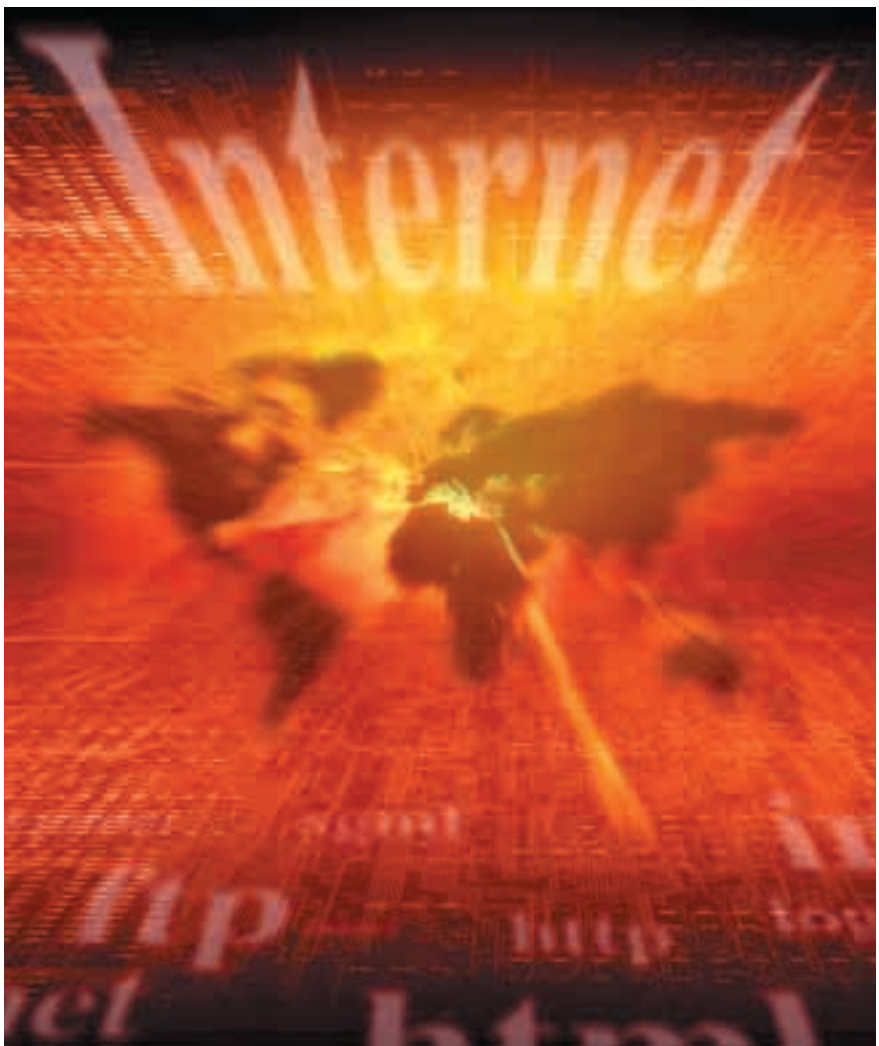
"Tidiness is half the battle"

To remedy this situation, ICANN, a commercial, but truly international organisation, was created. ICANN has board members from all continents. The election of these has been a long and difficult business, which still triggers off many debates. Check the current status on the Web.

ICANN has three subgroups, each with a responsibility that maps to the three types of issues above:

- **Internet Domain names**. The challenge for this group is to create and organise the Top Level Domains. A number of domains have been created in order to ease the pressure on the .com domain, like .biz, .name, .info. Examples of whats still may come are: .firm, .arts, .shop (and maybe even .sex?). The national top domains (.de, .fr, .uk, etc.) will continue to exist as before.
- **Numerical IP address**. Since IPv4 addresses are becoming scarce resources, there is some focus on how these are handed out. However, a more important issue is the policies for handing out IPv6 addresses.
- **Protocol Port and Parameter Numbering**. This group is not so much in the limelight, but continues the work done very much as before.

ICANN is still in the 'start-up' phase, and it is hoped that ICANN will limit itself to setting fair and equal policies for the different issues. Several commercial companies will then carry out the actual implementation of these policies. So, compared to the case of domain name .com, where a single US company had a monopoly, a set of 'Accredited Registrars' may sell domain names. The ICANN Web page contains a list of such companies.



HIGH POTENTIAL FOR THE WORK PROGRAMME 2001

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At the end of this year's technical assessment by the Groups of Experts 32 of the 41 submitted proposals were finally retained. This was one of the highest acceptance rates in the history of EURESCOM and can be credited with the heavy discussions that took place between the submission of Preliminary Titles mid August and the deadline for submission of proposals in the beginning of September.

On 13 October 2000 Calls for Priorities and Participation were issued to Shareholders. Their responses will be appreciated input to the forthcoming set up of the Work Programme 2001.

For details on the call, please visit our Web page:
http://www.eurescom.de/secure/workprogrammes/CEI.asp

By reviewing the retained proposals now subject to selection we find that:

- Most proposals expect their results to be exploitable in 2 to 3 years time. Only a few see the window of opportunity for their results more than 4 years into the future.
- There are an increasing number of proposals that want to work with suppliers and vendors. This is not a surprise as this kind of co-operation has proven very beneficial to both parties in the past. Co-operation with suppliers and vendors has also become a political issue for EURESCOM as part of the ongoing discussions of allowing suppliers and vendors to become partners of the Institute.
- A handful of proposals can be characterised as high risk or speculative in nature. 'High risk' should be considered a positive attribute: Whilst there is a high risk that the project may not be successful for technical reasons, there would be a high return to Shareholders if they were. These are the kind of work items that are most suitable for collaborative work by sharing risks and costs amongst several partners.

Space does not allow a presentation of all the interesting proposals now retained. However, the following paragraphs will give a flavour of the kind of work we are going to start at the beginning of 2001.

Interoperator IP Quality of Service

There is currently a strong technical, economic and market pressure to migrate PSTN, IP and mobile services towards a converged IP network spanning multiple operators. TelCos and ISPs need to design interoperable IP network systems that are capable of delivering differentiated quality of service to such IP based services. Telephony over IP is such an example as it will be one of the first services to be implemented. UMTS packet data services might be the next. PP1206 'Inter-Operator IP QoS Framework' will build on the work already done in EURESCOM by validating and enhancing the established Interoperator IP QoS Provisioning (IIQP) framework both from a technical and business perspective. The proposal will also extend the IIQP framework to support UMTS Internet QoS interoperability (i.e. SLA negotiation and QoS provisioning between the UMTS core network and ISPs).

On-line validation of Internet services

Nowadays, the provisioning of a wide array of services over the Internet by TelCos and ISPs increasingly depends on the orchestration of heterogeneous, widely distributed software components, which can be owned by different service providers and reside and operate over diverse networks. In such a scenario, designing and providing complex, value-added services, maintaining them, and ensuring their normal quality levels with traditional service deployment, provisioning, monitoring and management becomes increasingly difficult (and costly). PP1308 'On-line Validation of Complex Component-based Internet Services' envisages an approach in which this complexity is resolved by employing continual on-line validation over deployed services, through an automated infrastructure for the monitoring and control of services, which encompasses reactive as well as proactive intervention upon their architectures, configuration and behaviour.

DROWNING IN DATA

THE AGE OF INFORMATION OVERLOAD

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We are living in the age of information. At least most people in the developed countries and some in the developing countries are. But what does this practically mean?

There are basically two answers, a positive and a negative one. The positive answer: We have access to all kinds of information we have ever dreamt of and some more we never thought of. Statistical data from governments and international organisations, which were accessible for a few experts only some years ago, are now at our fingertips via the Internet. The negative answer: We are buried under tons of information. The average Fortune 1000 worker sends and receives 178 messages and documents every workday. About 1,000 books are published internationally every day. In a single day, a modern genetics laboratory can generate 100 gigabytes of data – the equivalent of 20,000 times the entire output of William Shakespeare. In the last 30 years mankind has produced more information than in the previous 5,000.

1000 new books every day

In a recent study professors Hal Varian and Peter Lyman from the UC Berkeley School of Information Management & Systems (SIMS) have analysed how much information was produced in the last year (http://www.sims.berkeley.edu/how-much-info/index.html). They came up with stunning figures. The total worldwide production of original content amounts to the unimaginable figure of about two exabytes in 1999. One exabyte are exactly 1,152,921,504,606,846,976 bytes. If this figure is hard for you to grasp you should know that all words ever spoken by human beings on earth are estimated to equal five exabytes. This means that under the current production rate it takes only 2.5 years to produce as much content as was spoken on earth since Adam and Eve discussed the quality of apples. On average every man, woman and child on earth currently produces 250 megabytes of storable, unique information, or 2.5 meters of shelved books.

Content production in 1999: 2 exabytes

Varian/Lyman differentiate between the four main storage media: paper, film, optical disks and magnetic devices such as disks and tapes. Not surprisingly, magnetic storage media have 79,83 per cent of the total production, followed by film with 20,15 per cent. Optical storage media and printed information have a share far below one per cent (optical: 0,00391 per cent; paper: 0,01131 per cent). What looks small in percentage is still an impressive absolute figure. Content produced on paper amounts to 240 terabytes a year, which equals 12 million trees. One reason for the data explosion besides the technological opportunities consists in what the Berkeley researchers call the 'democratisation of data'. Individuals around the globe create and store most of the information – 740,000 terabytes a year. Published information adds up to a mere 285 terabytes.

12 million trees for print

To whom this sounds like an abstract subject, here are some of the physical and psychic problems psychologist David Shenk lists as symptoms of information overload: increased cardiovascular stress, weakened vision, confusion and frustration, impaired judgement and decreased benevolence to others. As was found out in a EURESCOM project on 'Impacts of information overload' (P 947), the abundance of information does not necessarily lead to better decisions. If the amount of information has reached a certain point, the quality of decisions decreases (see mess@ge 2/2000, page 12). The recent history is full of examples. The Chernobyl disaster of 1986 and the shooting down of an Iranian passenger jet in 1988 by a US cruiser are attributed to humans, who are being overwhelmed by data. You don't have to look at nuclear power plants to understand the devastating consequences of data overload. Just think of your car. Dr. Charles Spence, of Oxford University's psychology department, says modern cars provide so much information on their dashboard displays that they can distract drivers dangerously. "Cars can have up to 100 pieces of information on the dashboard, and it produces a sensory overload so that the drivers miss important visual warning signals from the road," he warns.

Symptoms of information overload

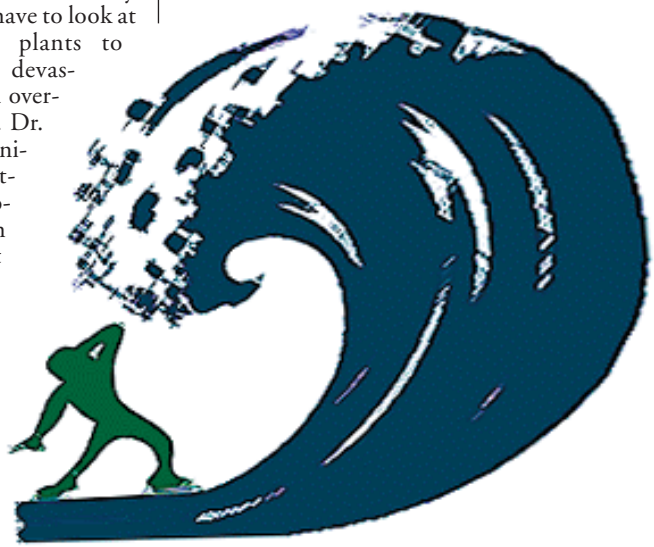
Professor Eric Harth of Syracuse University, New York, is also not very optimistic about the human ability to cope with information overload: "Technology is cumulative, growing through the addition of many small contributions, while intelligence, the source of this steady growth, remains fixed. We may find ourselves overwhelmed by our creations, when the intelligence required to achieve a certain level of technology may be less than that needed to survive it."

Sounds depressing, doesn't it? However, there is no need to despair. Here are ten practical survival tips, exclusively for mess@ge readers:

Practical survival tips

1. Prioritise your phone time.
2. Touch a piece of paper only once.
3. Act on e-mails immediately.
4. Use e-mail filters.
5. Don't surf on the Web without a goal, use clever search strategies.
6. Drop out of as many newsgroups as you can.
7. Select the information you need, delete what you don't need.
8. Learn what to look for.
9. Learn when to say 'enough' and stop looking.
10. Be aware of the danger of becoming information addicted.

If you need more information, please contact your EURESCOM information dealer and tell him how many terabytes you need.



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