EurOpen

News
Letter

EurOpen: The European Forum for Open Systems

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EurOpen: The European Forum for Open Systems

News Letter

THE SINGLE MOST IMPORTANT PAN-EUROPEAN EVENT TO SHAPE THE FUTURE OF OPEN SYSTEMS

92

Utrecht

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OpenForum

If there's one event in the 1992 calendar that's unmissable for anyone seriously interested in Open Systems in Europe, it has to be OpenForum 92.

A top-flight strategy and business conference will be combined with a high-level technical conference and a set of tutorial seminars to challenge the most demanding participants. And all this alongside a major exhibition showcasing Open Systems products.

OpenForum 92 is the only event backed by two of the world's largest associations dedicated to Open Systems, EurOpen and UniForum and managed by Europes' foremost organisers of exhibitions Royal Dutch Fairs and Reed Exhibitions.

Note the time and the place.

And be there: absolutely, positively be there!

...attending the conference/exhibition.

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Editorial

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The Single European Market

The abolition of trade barriers at the end of this year will change the way that we trade. It won't happen overnight, but happen it will, if you don't change to accept the challenge you will loose out.

■ What will the pan-European market look like ?
■ How will it affect us ?
■ How should we prepare for it ?
■ How can we best take advantage of it and of CEC funding ?

These questions are the theme of this newsletter. We start with a look at the market: who are the major players, what are the biggest and fastest growing markets and how companies will need to adapt to it.

The size of the market will exceede that of the USA, and this alone may help to redress the balance away from USA - but only if we can start to think and believe that we are a single entity. This will be our biggest problem, it is not just one of languages, but the different ways that we think. At the end of her paper Sharron Burgmier illustrates just how difficult this can be - the first part gives some useful tips on how to cooperate and so obtain ESPRIT funding.

How do you bring a product to the international market? Sure it needs to be internationalised so that the user interface is suitable for different languages, but there is more than that. You need to market, sell and support a product in (what to you) is a strange environment. Jean-Charles d'Hardcourt tells us how Grif managed it.

Peter Theobald shares with us why he finds the single market exciting and believes that it will be a great opportunity for Independent Software Vendors such as his company.

At the other end of the spectrum is Mark Miller of Sequent who looks at how users will be affected by regulations and how changes in vendor strategy will act to their benefit.

Glenn Kowack's EUnet column is devoted to telling you about the different pan-European networks - what they are, who they are for, ...

Newsletter Changes

The idea of having a theme to each newsletter is to improve it's quality, let us know what you think - also what themes would you like to see? We now have an editorial committee made up of National Group representatives, they should help to decide our long term strategy.

The information section at the end of the newsletter has been expanded, and now includes the calendar, the publications list and order form and more addresses than ever.

OpenForum

Enclosed with this newsletter is a brochure for OpenForum '92. Read it, complete the booking form and attend.

The programme is exciting, the speakers of top quality, there is something for everybody, don't miss it.

Network Management

The theme of the next newsletter will be network management. This is a technology which is becoming increasingly important, for instance it is at the heart of the client/server trend which is becoming ever more popular.

The issues are no longer "can" various machines talk to each other, but how can they be controlled. Heterogeneous no longer means different brands of UNIX platforms, but different operating systems and different networking technologies.

We will be looking at the motivations, problems, solutions and effectiveness of attempts at bringing order to chaos, ensuring security, facilitating mission critical dataflow, ...

Contact me if you have something to say on the subject. Do so now, and let us discuss your ideas.

Advertising space will also be available.

The European Unix Market: Trends and Issues

Per Andersen
IDC
Copenhagen

Per Andersen holds a master degree in computer science from the University of Aarhus, Denmark.

Prior to IDC, Per Andersen worked as a consultant in the IT industry for 7 years, responsible for the introduction and use of information technology in Danish organisations. This included being adviser to the Danish government, establishing procurement agreements on PCs and departmental multiuser Unix systems.

Per Andersen is the manager of IDC's European Unix Expertise Centre publishing market research reports to the European IT vendors and users.

The 1991 Unix Marketplace

Unix hardware in Europe picked up growth in 1991 compared to 1990. Overall Unix hardware growth increased to 15% last year. Compared to the overall European hardware market, which declined in value last year, Unix continues to have both momentum and increasing penetration of the market.

IDC's market research shows, that the total value of the European Unix systems market was 5 billion ECU (£3.6 billion) in 1991 compared to 4.5 billion ECU (£3 billion) in 1990.

Workstations running Unix fell a little short of expectations as 117,500 workstations were shipped, representing a growth rate of 30% over 1990. In terms of value, growth amounted to 16%.

The Unix PC segment was very slow last year having an overall growth rate of 14% in units. Of the two subsegments, Unix PCs being used as single user systems experienced good growth at 43%. However, this could not offset a very low growth of Unix PCs being used as low-end multiuser systems.

Instead of growth in the "multiuser Unix PC" segment, growth was moved into the low-end multiuser systems segment by a number of Intel-and RISC-based product offerings from traditional multiuser systems vendors. This, combined with downsizing from midrange multiuser segment, resulted in a very high growth in the small scale segment.

As systems continue to be downsized, the high-end Unix systems once again performed very poorly. The overall midrange segment decreased by 16% in units and this also affected the Unix part of the market.

Shipments of medium scale Unix multiuser systems fell 2 percent, while the value increased slightly by 2%, indicating an increasing average system value.

Spain and Germany Fastest Growing Markets

The fastest growing Unix market in Europe is Spain, having a value growth rate of 35% in 1991. Growth is still spurred by government investment policies and especially the workstation segment witnessed healthy growth.

Also sales in Germany continue to outgrow most other European countries. The German economy was strong in 1991 and although IDC has lowered the market expectations for Germany somewhat, the Germany market is still a major driving force in Europe in terms of Unix systems.

Especially the Unix PC and small multiuser systems segments experienced high growth in Germany. While the marketshare of SNI slid in the small scale market, IBM and Sun had significant success. Also Unisys, somewhat reversed to the rest of Europe, had a good year in Germany.

Growth of unix system sales in France in 1991 could not keep up with 1990 and the overall growth rate declined to 6% compared to 14% in 1990.

in particular, the Unix worksations market in France performed poorly last year and actually witnessed a decline in value (although volume increased). Declining Hewlett-Packard sales of workstations were the primary reason for the depressed market.

In spite of recession, growth in Unix sales continue to be significantly high in the UK. The recession might result in slow hardware sales in general, but there are certainly no signs of any impact on the Unix market. An explanation might be found in the trend also found in some other countries (eg Sweden); in times of a depressed economy and slow investments, IT purchases tend to move to less expensive, low end systems, and this might mean Unix systems.

Small scale multiuser systems running Unix was the major growth area in the UK last year, and major players were ICL and IBM, both having seriously increased marketshares.

RISC Advances

It is clear that RISC business is healthy for most vendors. Hewlett-Packard, one of the first vendors to enter the RISC market, continues to hold a strong position in the market, especially in the workstation and high end multiuser systems segments.

In Europe, Hewlett-Packard is the largest Unix vendor ahead of Sun. Through 1991, HP shipped a significant number of the new series 700 HP-PA workstations, even though sales were hampered by the supply situation which hit the high end systems in particular. The reason was inadequate supply of floating point chips from Texas Instruments.

The bulk of workstations shipped last year, though, were the Motorola based series 400. IDC expects HP's Motorola business to drop in the future while the RISC business will increase. So do HP; they have announced a migration program to move 400 users to 700 models. Upgrades will be available for series 400 in early 1993.

Through 1991, Sun grew faster than the overall Unix systems market. Most successful were the server products lines, while revenues from workstations did not increase as rapidly. First half of CY 1991 was good for Sun, but finding themselves lagging behind in performance combined with a weakening market, consequently led to a fall in shipments in Q3 which only marginally improved in Q4.

Sun servers showed good results in 1991. Sparcservers constitute the largest part of the server shipments, and revenues were boosted by the announcement and shipments of the new 6xx multiprocessor Sparcsystems. Shipments of these began towards the end of 1991 and Sun managed to sell them in significant numbers before the end of the year.

Another rider of the RISC-wave, IBM, experienced significant success in 1991, the first full year of RS/6000 shipments. IBM succeeded in building up distribution channels for the RS/6000's, utilising the wide existing base of resellers. While most systems in the US were sold directly, the majority of systems in Europe, around 60%, were through indirect channels.

Sales of RS/6000 systems in Europe exceeded IBM's expectations. However, the split between technical and commercial systems might have been surprising to IBM. In an attempt to avoid cannibalising against the lucrative AS/400 market at one end and high volume shipments of PS/2's in the other end, IBM has attempted to emphasise the technical advantages of RS/6000. In spite of this, a high number of systems have actually been sold as traditional commercial multiuser systems.

Is DEC Serious?

There is no doubt, that Digital is serious. The question remains, however, is Digital serious about Unix! On the background of a strong technical market position and the Unix origin on a DEC platform, Digital originally was one of the initial vendors to enter the Unix market.

As the market matured and the commercial segment became increasingly important, Digital experienced difficulty in convincing the market that Unis was a strategic platform.

The reasons for this was partly found within the Digital organisation. Ultrix was up against a "better" operating system in VMS and a healthy business in this area. Signals from the top of the organisation did not help much, and in spite of Digital's claims that 10% of all revenues came from Ultrix, there was no evidence for this. Internally, Ultrix was in fierce competition. opposite to IBM (also having healthy proprietary lines) and Hewlett-Packard, Digital has no history (or cultural basis) for having more than one strategic platform. This, and a far less aggressive marketing of products compared to its competitors, has led to a weakening Unix market for digital.

When surveying users, Digital's historical position becomes evident. IDC's user surveys show that Digital is generally thought of as a leading Unix vendor. One thing is image, another is actual sales, and it is evident that the image of Digital as a Unix supplier is stronger within its own ranks of VMS users.

Again in 1991, Digital's share of the Unix market continued to slide and is now 3.5%, down from 4.1% in 1990. This does not include shipments of systems from the data division of Philips and Kienzle, both acquired by Digital. This move added to Digital an important installed base of clients as well as significant marketshare.

After announcing the Alpha technology and Open VMS, the future Unix position of Digital appears hazy, DEC, including Philips, is still offering or plans to offer a wide range of platforms (VAX, Alpha, Intel, Motorola CISC, Motorola RISC and Mips) and a number of operating systems (Ultrix, SCO, VMS, Open VMS and NT). IDC believes the combination of Alpha and Open VMS is strategic with NT as the outsider.

European Vendors in Product Transitions

European vendors are still struggling along trying to restructure their organisations or changing product lines - or both. The only major European-based vendor experiencing success seems to be ICL. Once again in 1991 they were able to increase their marketshare of the Unix systems marketplace. Sales of DRS 6000 systems were high and ICL's overall marketshare increased from 3.9% in 1990 to 4.1% last year (excluding Nokia).

Siemens Nixdorf, still the largest European Unix vendor, had below average growth in 1991 and, accordingly lost marketshare. And that in spite of the advantage of being the primary vendor in Germany, one of the more lucrative markets in Europe. It is now a year ago since SNI declared their unified product strategy of launching new Intel- as well as RISC based product lines. On the RISC side the high-end RM600 system has been announced. A low end RM400 has been

announced, but nobody probably has discovered this as the product has hardly been promoted.

In a market changing very rapidly and with very short product cycles, the time it has taken SNI to build and market its new product lines is not impressive. In order to remain a key Unix vendor, SNI must rapidly exploit its opportunities.

Bull is still in the process of restructuring its organisation and in the beginning of the year its new international Unix marketing group finally fell into place. the most difficult task, though, lies ahead of Bull after the agreement of moving IBM's RISC platform. A major Unix announcement took place in April where Bull announced the first IBM-based systems (DPX/20).

The low-end Intel-based business was booming last year, and Olivetti took advantage of the positive environment by shipping a high number of LSX 5000 systems. However, just as Bull they found that these systems didn't generate much revenue. The LSX 3000 series still shipped in some volume last year but lost momentum.

European vendors are decidely not found among core UNIX hardware developers, as most of them are taking systems or components from other vendors. Instead they increasingly focus on systems integration and software. Because of slow hardware growth in the future this might indeed be a very wise decision.

Yet, increased focus on software and services is just another survival strategy for European vendors and the question is, whether it addresses the fundamental problems for the major European vendors. Lack of professionalism is obvious and dependency on the European market makes the vendors too vulnerable. Whether this can be changed short term is doubtful, but the potential is there.

Changing Structures in Europe

Europe is on its way to a single or at least a more harmonised market. The road to this vision is still long and filled with obstacles and barriers. The transition can not be expected to take place over a short period of time. Instead, a single market is becoming a reality very gradually and the effects will only be visible over a longer period of time.

Besides becoming more attractive to non-European companies, a single European market will give large European companies an increased possibility to exploit market opportunities. A number of businesses have already seen the potential and Europe has seen an increasing number of mergers and acquisitions (M&A) through the last couple of years. Even though the level of M&A's has decreased again in 1991, we still expect company infrastructures in Europe to change significantly in the forecast period.

Europe is highly dominated by small establishments, 99% of all establishments have less than 100 employees and 93% less than 20 employees. This makes the European market quite different to the US. changes will

come, though, and there should be a growth in large establishments typically growing into pan-European companies.

The impact of the European infrastructure for the IT market is not necessarily a simple one. One would assume, that the high number of small companies would result in a high penetration of small scale multiuser systems and thus spur sales of Unix systems. This is not the case, however, and the fact that small multiuser systems are relatively dispersed in Europe can probably be explained by a significant bias towards LANs. In addition to this, in the US a high number of small multiuser systems are sold into replicated site applications at remote locations of big companies.

On the other hand, the number of medium scale systems is relatively high in Europe compared to the US. the reason for this could be that a significant number of medium and small companies exist that use medium scale multiuser systems as their "mainframe".

Changes in company structures would consequently lead to changes in use of IT technology. But it is not evident, which hardware segments would benefit most from a changed environment.

It could be argued a growing number of large companies would strengthen sales of large scale multiuser systems. On the other hand, it could also be argued that mergers would result in a lower number of large scale systems as data centres are merged as well.

The same duality is found in the medium scale segment. A growing number of medium sized companies could be seen as a driving factor for medium scale systems. However, if the majority of mergers migrates companies from medium scale users to large scale users, this effect will not occur.

In any case, the effect of a changing European environment can be assumed to be slightly increased IT activity, and for two reasons; As (or if) European companies grow more competitive, the need for and the resources to acquire new information technologies will also increase. Secondly, restructuring, changes and integration of new business units will for a period of time in itself result in a higher level of investments.

This can also be expected to have a steady (but slowly) impact on sales of Unix systems in Europe. Increased IT activity means investments, and looking at investments patterns a relatively high share of funds goes into the Unix business, In addition the need for integration of new businesses, restructuring etc will create higher focus on systems integrations - to which open systems often are seen as the solution.

However, what could be far more important than the single European market, at least long term, is the opening up of Eastern Europe. Even though a number of problems still exist, such as lack of infrastructures, capital and powerful companies, the long term market potential of former Eastern Europe provides incremental growth opportunities for IT vendors.

End User Perceptions

Mark Miller
Sequent Computer Systems
United Kingdom

Having been born in England, raised in Norway, and worked for six years in Germany, Mark Miller can be described as a true European. Before becoming Sequent's UK Marketing Director, Mark was European systems marketing manager for the Santa Cruz Operation where he played a decisive role in establishing the ACE Consortium and was heavily involved in the X/Open Marketing Management Committee. Miller's career also includes eight years with Hewlett-Packard where he held a number of positions in Norway, Germany and the UK.

The technical developments of Open Systems are reflected in more open ways of doing business. According to Mark Miller, Marketing Director at Sequent Computer Systems, this new attitude to business cooperation will have a profound impact on the way IT is supplied throughout Europe.

Open Systems is not about Unix, or any other product for that matter. Instead, it is about a way of doing business. In particular, the Open Systems movement reflects itself in the new partnerships that are emerging throughout the IT supply chain, bringing together the strengths of many companies in order to supply a functional solution to the user's business problem.

From the user's point of view the new cooperation means that the best technology and the best support will be freely available for the first time. Instead of being forced to take a complete solution from a single source, users can now pick the best elements to complete their IT environments. They can, for example, decide upon a software package first, then choose hardware platforms from, perhaps, different suppliers and, finally, employ local third parties to support the environments in different countries throughout Europe.

The Open IT market is being forced to operate in such partnerships by two factors. The first is the fact that large organisations are no longer willing to fund in-house MIS resources for the development and maintenance of computer systems. The second factor is the ever increasing competence within the IT supply chain; This is a direct result of IT professionals abandoning the diminishing MIS departments in favour of the IT suppliers, and taking their expertise with them. Consequently, today's suppliers have a much

better understanding of user's problems than they have ever had in the past.

The Impact of the EC

The restricted practices which have traditionally operated throughout Europe in the past have done little to encourage the partnership mentality that is demanded by Open Systems. The trade barriers between countries, boosted by national investment programmes, training schemes, tax benefits for manufacturing and even employment legislation, have given local suppliers an enormous advantage in their home markets. A French company such as Bull, therefore, has had an automatic advantage in France over a British supplier such as ICL - even before one considers aspects such as the production of local documentation.

With the arrival of the EC, however, all this is about to change. As trade barriers are pulled down, the cost of entry into a country will be drastically reduced; the price-sensitive Open Systems market will be affected by logistics changes which will enable companies to substantially reduce their European-wide distribution overheads. Open Systems users can, therefore, look forward to seeing such advantages passed on to them as part of the never-ending price / performance battle.

In addition, pro-active EC legislation will force member countries to abide by the GATT guidelines which make it mandatory for government bodies to invite competitive tenders for systems worth in excess of 130,000 ECU (£91,000). Whilst government bodies may feel the impact of such legislation most acutely, it will also affect the many private organisations that supply the defence industries and central governments. In this way, the legislation will increase competition for Open Systems throughout the whole market.

Some of the changes to IT that we can look forward to will not be merely financial, however. One of the most interesting developments, perhaps, will be the move away from national cultural IT. The French IT industry, for example, is very closely linked with the telecommunications industry while in Germany, the strong manufacturing and financial base is reflected in the markets which German IT companies such as Siemens Nixdorf specialise in. In the UK, meanwhile, companies such as ICL have concentrated more on the IT requirements of local and central government. From

next year, however, this nationalistic flavour of IT will be threatened by organisations which, with manufacturing and research sites spread throughout Europe, can prove themselves to have no nationalistic axe to grind.

The Localisation of Unix

The lifting of trade restrictions will also have important implications for Unix. Very much an American operating system, Unix has often been criticised for its lack of international support. For example, if you run a French word processing package complete with French interface and documentation, all system messages are still likely to appear in English. The increase in competition will, however, require applications to become increasingly specialised at the local level. This, in turn, will demand ever increasing localisation from the operating system.

It is also to be hoped that, with the coming of the common market, we will witness an increase in the level of standards throughout the IT industry in general, and for Open Systems in particular. This will follow on naturally once governments start to procure multi-nationally, forcing them to set standards that international suppliers will have to adhere to. So, for example, it is currently possible to supply the public sector in the UK with computer systems that do not conform to the XPG3 X/Open standard. In Germany, however, compliancy is absolutely mandatory for local government. Thus, it is currently economically feasible for suppliers in the UK to exist without complying with XPG3 X/Open. But from next year onwards if they wish to compete in the German market they will need to pay more attention to the required standards. Therefore, whilst adherence to standards is an option for many IT suppliers today, it will become a pre-requisite for survival tomorrow.

Consistency Amongst The Change

When discussing the impact of the EC on Open Systems technology it is worth considering the aspects of the market which will, to a great extent, remain unchanged by the developments in Europe.

One of the most obvious of these will be the need for IT suppliers to provide local support in the local language. Trade barriers may well be lifted, but many cultural and linguistic barriers will still remain. French organisations will continue to demand software which interfaces with users in French, which is supplied with French documentation, and supported by French people. None of this will change just because Europe is becoming an Open Market. The question is not so much whether this will happen, but who will be responsible for the localisation?

The answer may lie in the emergence of a new breed of IT company which specialise in "localising" international products for national markets. Open Systems systems integrators will be able to take foreign products and, by adding local value including support and training, distribute them in national markets.

To a certain extent this kind of international systems integration work is being done already, but the high cost involved currently excludes all but the very biggest systems developers. Furthermore, the best such systems are typically supplied in an American version of English. At the moment, therefore, "localisation" can hardly be said to have reached its zenith. But as the distribution economics change, it will be possible to provide users with more and more specialised support as well as a greater choice of system. So, for example, whereas only companies the size of IBM, HP and DEC have been able to sell financial packages on an international basis, the market will be opened up to very strong local companies who can not only provide very specialised systems, but can do so successfully for local markets throughout the community.

Just as there will remain a need to provide local language support, so Open Systems will continue to be marketed very differently throughout the community. Regional knowledge will remain a crucial element of the sales strategy, as will local techniques for influencing the press. Furthermore, despite the emergence of centralised warehousing, it will still be necessary to provide users with technical support on the local level; and from time to time, engineers will need to visit users on-site to look after their individual requirements.

Generally speaking, the EC will provide the market impetus to make the Open Systems world - which is, perhaps, rather bland at present - very much more specialised. As a result, users will witness the emergence of products and services aimed more directly at them and their requirements. Users will also benefit from systems which are far more cost effective. To an extent, this will be true of proprietary systems as well, although the price sensitivity of the Open Systems market will mean that cost reductions will be passed on to users far quicker in the Open Systems arena.

Conclusion

So how does all this affect users wishing to provide IT support on a European-wide basis? An insight into the beneficial effects of European-wide IT cooperation can be gained from the experience of BP Oil. Over the next couple of years, BP Oil will be awarding contracts worth 19 million ECU (£13 million) to form part of its European Systems Programme, a massive Open Systems investment programme involving accounting, stock movement, sales, data transfer and management information systems. It will involve the purchase of over one hundred servers of varying specifications from both Sequent Computer Systems and Sun Microsystems to run applications using software written in Oracle and Uniface.

In the past, without either Open Systems or the EC, BP Oil would typically have to look for an IT company that was present in every target country. Today, however, BP Oil has been able to make its choice based upon the

best technology solution that they could find. Then - and only then - have they had to consider how to support this technology in the different countries. Because the systems are culturally, as well as technically "open", this simply involves employing partners to help supply and support the business solution throughout the community.

Already, therefore, companies are beginning to see the benefits of adopting an Open Systems supply policy across Europe. For the first time the supply chain is mature enough for them to adopt the best hardware and software solutions in all countries. In the past, the lack of such maturity meant that organisations were often forced to treat different countries as separate entities. Frequently this would mean using Olivetti hardware in Italy, Bull hardware in France and Siemens Nixdorf equipment in Germany. The lifting of the trade barriers at the end of this year will, therefore, will enable Open Systems strategies to become as mature on the international stage as they have already become nationally.

Golden Rules for Participating in European Projects

Sharron Burgmeier
Kewill Systems

Sharron Burgmeier, Group Project Development Director at kewill Systems is an experienced participant in European projects. Born in Texas, USA, she is an American who has made a success of Europe!

Recently, she entertained and informed an audience of present and future ESPRIT participants, by presenting some golden rules on how to participate in European community projects. Euro-Technology found her advice and insights so important and perceptive that we have asked her to pass on that experience to our readers.

Sharron has had one proposal accepted and one rejected under the ESPRIT programmes. These proposals, VULKAN (hereafter referred to as the Loser) and CIMple (the Winner), are the templates from which Sharron's advice is illustrated in her presentation. These programmes are outlined in Table 1.

The Kewill Group, with a turnover of 50 MECU and 8000 user sites worldwide, employs 450 people in 8 group-companies. Kewill is the leading vendor of CIM solutions to SMEs in the UK. Founded in 1971, it went public in 1985. Kewill was the prime proposer and is the Programme Manager of CIMPLE, an ESPRIT II project awarded in 1990.

This presentation is based on edicts which are, in Sharron's experience, the key to successful proposal writing and participation in European Community projects.

First Write a Good Proposal

A proposal must always be clearly presented. The EC has produced a clearly defined set of rules for the structure of a proposal. It has put a lot of effort into preparing these rules and it is a MUST to follow them. It is essential for example to use the right section headings and that the technical work breakdown reflects the objectives of both the call for proposals and your project, etc. Indeed, these rules apply to any project proposal you write. However, when a proposal is written by people from several different countries, from both academic and industrial backgrounds, it is easy to end up with a discontinuous proposal, with

some sections extremely well written and others very poorly. Poor sections often result from the need to split-up the proposal writing between participants. Inevitably some participants end-up writing sections which are not their speciality.

The written proposal must be believable, both to the participants who will undertake the work and to the reviewers. In particular, it should be made clear to the reviewers that you understand where important technical advances will have to be made. Can the technical problems be realistically solved within the time frame of the project? More importantly, can they be solved by the make-up of the Consortium? The budget should also be believable and correspond to the resources of the partners.

Finally, it must be made clear to the reviewers that your project will be manageable. European projects are not supposed to follow strict line management structures but must operate through well organised technical and management committees. Many prime contractors learn the hard way that one cannot run a European project using line management techniques.

PROPOSAL NAME: DATE	VULKAN: DATE 1989	CIMPLE: DATE 1990
Objective	Specification of CIM solutions using Knowledge Based Techniques	To provide a set of tools and methodology to support the implementation of CIM in SMEs
Role of Kewill	Prime Proposer & Project Manager	Prime Proposer & Project Manager
Financial Size of Project	5 MECU	2.4 MECU
No of Partners	16	7
Duration	4 Years	2 Years
Reviewers' Verdict	Rejected	Accepted

Table 1: Profile of KEWILL ESPRIT Proposals

PROPOSAL NAME: DATE	VULKAN: DATE 1989	CIMPLE: DATE 1990
Reasons For Verdict	No profile in Brussels for any of the Partners; project too ambitious; too many partners; no involvement of ESPRIT office in proposal Stage	Project was "believable"; ESPRIT office involved with draft copies of proposal; partners were "suitable"; size of project was right; proposal matched the call.

Table 1: Profile of KEWILL ESPRIT Proposals

Anticipate the Proposal Evaluation Process

It is not uncommon for European Programme "Calls for Proposals" to be 6 or 7 times over-subscribed. This means a lot of work for the reviewers. Many of them have already spent days writing the technical profile of the call for proposals. If your proposal does not fit that profile or follow the rules for proposal structures, the reviewers will be only too pleased to have one less proposal to review. It does not matter how good your proposal is, it will only be reviewed against the technical workplan.

Anticipating the proposal evaluation process is the same for European and National projects, so the same sort of rules apply. It is worth having a UK partner in a project in order to verify the use of English in the proposal. they might also do some technical work! However, one should guard against the use of clever prose, as not all reviewers will have a degree in English language! It is recommended to keep the text simple.

Only Propose Work You Really Want To Do

European projects are a very good way of maximising the benefit of a company's research budget. If a company has a total research budget of x ECU then European projects will double that budget to 2x. Supposing there are 4 other partners in the project, this provides another 8x of research in the project. Thus, a European project an, as in this example, provide an additional 9x's worth of research for your organisation's x ECU.

However, research is only 50% funded for commercial organisations and the EC's auditing procedures are very clear on this subject. It is therefore very important that an organisation ploughs its precious research budget into work it really wants to do. European projects should not be seen as a way of improving revenue. They are a way of increasing research resources. Also, it is much more likely that a convincing and believable proposal is based on research your organisation really wants to do.

Calculate the Cost of Developing the Proposal Very Carefully

Preparing a proposal can be expensive, both in terms of direct and indirect costs. The skill set of the staff you will need to second the proposal effort will generally mean pulling some of the best people off other work. You can expect the initial proposal development effort to last a minimum of 3 months. Modifications and development of a technical annex, in the event of an award, will take another 3 months on average. These are elapsed time; it is not likely that you will need to staff these efforts full time. However, reviews will be time consuming and, even an SME with be a minor participation in the project, you may be asked to write sections of the proposal. You will almost certainly have to write your own work plan section.

In addition, there will be travel and subsistence costs incurred in the course of consortium planning meetings. You should expect to make on average one two-day trip a month.

A rough estimate of costs for developing proposals is 35,000 ECU for the prime proposer, and 8-14,000 ECU for the partners. Associate partners and subcontractor costs for developing proposals can be slightly less.

Calculate Your Development Costs Equally Carefully

A winning proposal can turn out to be a losing project if you have not calculated your costs accurately. You must take a close look at your labour and overhead costs. Make sure you have factored in all eligible costs. If you have already participated in any nationally funded programmes, then you have already established rate which could be used as a baseline for costs.

You must assume that your productivity rates will go down as you need to work with other partners, some of whom do not speak good English, most of whom will be remotely located, and all of which will have work practices which vary widely. These difficulties should be considered in making time and cost estimates for work modules. There are ways by which you can try to reduce costs. One method is to be an associated partner rather than a full partner. Associated partners can avoid some of the managerial overheads of a project. Cost can also be reduced by being a sub-contractor though that will not entitle you to any exploitation rights.

Review your Proposal Early with the Commission

It comes as a surprise to many people that the Commission wants to and can help in the preparation of a good proposal. You can actually go directly to the Commission and talk to them. Your aim should be to make the Commission fans of your proposal. Make them feel that it's what they want to fund, that it involves the

type of people they want to see in the project and that YOU really care about getting the proposal right.

Incidentally, some large companies really understand the importance of this. They have set-up offices in Brussels to help them lobby the Commission. What you particularly want to avoid is the situation where the Commissions sees the proposals for the first time in the evaluation phase.

Consider Your Consortium Make-up

As I have mentioned before, the Commission can help you form a Consortium with the right balance. However, there are some useful ground rules. Firstly, a Consortium should try to have at least one partner with experience of European projects. That partner should know what documents to read when preparing a proposal and understand the financial support available (eg topics such as depreciation of equipment in budges). Secondly, in many cases, there is little more than 3 months between the call for proposals and the final submission date. Given this fairly short time frame, it is advisable to know in advance as many of the partners in a Consortium as possible. This will give you a good ideas of how the potentially complex social interactions of the consortium will work.

Thirdly, a consortium should be like a good meal with each partner being like a well designed course that blends into the meal. The Consortium should have a sensible number of partners (preferably not more than 6). A partner can have a number of sub components such as associated partners and sub-contractors. The partners should complement each other, with no undue duplication. There should be one significant Prime Partner. The Prime Partner should be like a good waiter, able to orchestrate the whole project whilst not being perceived as authoritarian in any way.

Table 1 shows the consortia sizes for VULKAN AND CIMple. The CIMple consortium was potentially manageable, the one for VULKAN would probably have been a bureaucratic nightmare.

Develop a Profile for Your Consortium

Reviewers are only human! They like to feel that they are making the right decision when they select a project. If your consortium is unknown, you should start by trying to develop a profile. Make sure the Commission know who the lead experts in the project are. Make sure they know the names of the main organisations and what those organisations excel in. Do the organisations have a reputation in an area the reviewers may not know about (eg in a foreign market)? Make sure the Commission know about this reputation and the products, services and awards that have earned the organisations that status. Finally, once the Commission has a clear idea of what your consortium stands for, you can start selling the project.

Joining an Existing Consortium

Many small and medium sized organisations will prefer to join someone else's consortium rather than try and form their own.

An organisation must put itself on the market. To do that, it can look through lists of existing European projects to find the consortia it would like to join. There is a good chance that an existing consortium will submit new proposals at some stage and a company can try and join it by selling itself to the consortium in much the same way as the consortium must sell itself to the Commission.

Another way is for the company to register with Eurocontact, the database service provided by EuroKom to help organisations find partners for European research projects.
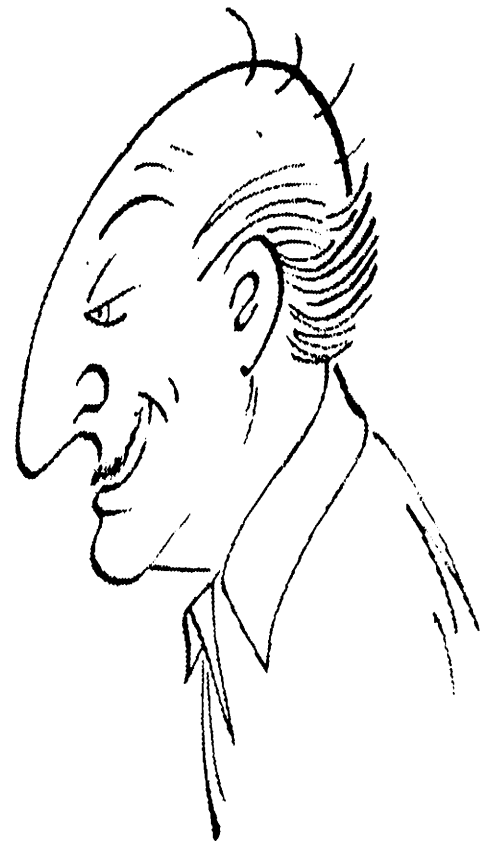
Figure 1: Make sure the Reviewers know about the products, reputation and customers of the partners before they review your proposal.

Become a European

My final and perhaps must important edict is that to participate successfully in a project you must become a European. One of the great strengths of Europe is the wealth of cultures and backgrounds that can be brought to bear on a project. It can also be the greatest pitfall.

To illustrate what I mean by all this, I have listed some particular cultural traits that I, as an American, have had to learn to work with:

Firstly, the Portuguese' attitude to meetings is that they must dynamically express strong personal opinions, preferably contrary to everyone else's. No offence should be taken by the other partners, this is simply how they are used to proceeding at meetings.

The Italians, when shown a working document which they may have signed previously, will rapidly back-track by claiming that they didn't really understand it at the time and would like to make some changes.

The Germans work to the book. If a document written in the early stages of a project states that something will be done in a given way, that is how it will be done.

The British don't even read documents. They arrive in their pin-striped suits, flick through the documents at the start of a meeting and then loudly express their opinions on every subject that comes up. To compensate for their greatest advantage, the fact that English is their natural language, they always take on a foreign accent and speak in mono-syllables making themselves generally incomprehensible.

The French will claim documents are not important unless they are written in French.

The Greeks can get very suspicious when you ask them to sign a document and usually take ages to do so. To them, their work on the telephone is binding and they will pour over the small prints in search of the "trick" that must inevitably be contained if they are being asked to sign.

The Spanish, when shown a signed document, will throw up their hands and look bewildered. "We don't know how this could have happened" they will claim, and all present will deny any responsibility.

A European project contract is like a marriage. It must be entered into with a spirit of compromise and understanding. It can then be highly successful from a

technical viewpoint and enjoyable from a cultural perspective. It will make a European of you too!
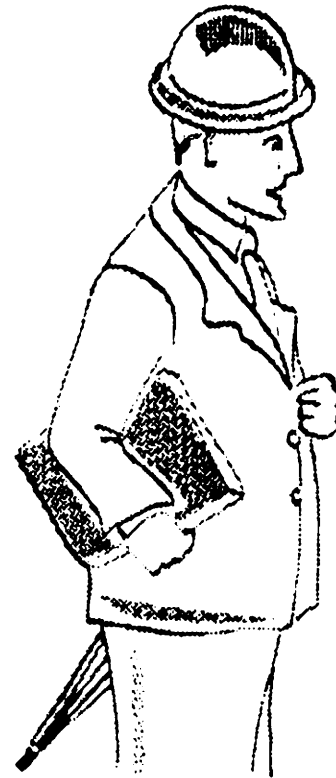
Figure 2: Papers provided in advance will not necessarily have been read. Lack of preparation in no way inhibits the British from passing judgement or expressing opinions.

An Overview of Pan-European Networks

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Introduction

The formation of the European Community was motivated by the observation that national borders had grown less and less meaningful; that actions of industry abroad could frequently have greater effects on domestics affairs than could local government.

The international networking scene demonstrates this development every day. Technologies resist the influence of national regulations, in spite of efforts to bring them to heel; data stubbornly refuses to recognize when it is crossing a border. This is reinforced by movement toward deregulation and open markets.

This is not strictly an EC phenomenon: many of the Central and Eastern European countries are actively involved in networking and are developing national telecommunications legislation which is much more open that than in the EC. We may some day even see Central and Eastern Europe take the lead in telecommunications business and innovation.

This issue's column looks at the borderless international networks and associations: their identities, structures, and roles.

International network service providers broadly divide into three groups:

■ Government-Supported Research and Development Networks and Associations,
■ Commercial Service Providers, including the PTTs in varying degrees of reform, and
■ Special-Interest and Amateur Networks.

EUnet uniquely shares characteristics of all three of these groups.

Government-Supported R&D Nets and their Associations

Most government-supported R & D nets have mixed agendas. On the one hand, their mission is to provide networking services for a specific community: the universities, government institutes and corporate research groups which fund academic research. On the other hand, they are often used as instruments of national and European industrial policy, which

sometimes includes supporting key technologies (e.g., protocols), service providers (e.g., PTTs), and product suppliers (e.g., Siemens).

Besides EUnet, some of the most important international R & D networks are:

HEPnet, EARN, NORDUnet, EASInet, andIXI.

HEPnet, the High-Energy Physics Network, is a mission-oriented network providing services to the high-energy physics community in Europe (there is a corresponding HEPnet in the United States). In practice, this means providing connectivity between CERN and its international treaty member organizations across Europe. Since high-energy physics is a leading user of R & D network services and bandwidth, nearly every research network, even those outside of physics, has a direct or one-hop connection to CERN. HEPnet is one of the largest and fastest pan-European networks.

HEPnet today uses a combination of Internet Protocols, as well as SNA, X.25, and DECnet to provide e-mail, DECnet, and IP-related (remote login, file transfer) services. The network has a significant presence in Central and Eastern Europe.

CERN funding has an interesting twist: some of it comes from national Ministries of Foreign Affairs, the usual signators of the original CERN treaty (which, HEPnet participants enjoy pointing out, predates the Treaty of Rome).

EARN, the European Academic Research Network, received its original seed funding from IBM; it has since found other sources of funding. Founded in 1985 (three years after EUnet), it has a substantial presence in Africa and the Middle East as well; the total number of hosts is ~940 at ~550 sites in ~27 countries. Each country has a national EARN organization. EARN's sister network in the US is CREN (formerly BITNET).

EARN's most important service is Network Job Entry (NJE - which makes it possible to remotely execute programs on IBM mainframes), along with e-mail, file transfer, and mailing list services. NJE is generally considered obsolete, and remote access is not widely available on EARN. EARN is also hampered by low-speed lines operating mostly at 9.6 kbit/sec or less. EARN hosts are ~50% IBM mainframes, the remainder

are heterogeneous but primarily DEC VAXes. Some EARN sites now use TCP/IP.

EARN has stopped growing: its user base is static (the community of academic IBM mainframes is saturated and is not growing). EARN has, however, done a laudable job of quickly connecting to Eastern Europe and other locations outside of Europe.

An initiative is under way to investigate ways in which EARN and RARE (see below) may merge, but this appears to have stalled recently. EARN is an active participant in Ebone92 (see below).

NORDUnet is a consortium of networks in each of the five of the Nordic countries, and supports Nordic EARN, HEPnet, national research needs, and to some extent, EUnet. NORDUnet provides access to over 10000 computers in the Nordic countries, and is primarily providing IP services. NORDUnet is by and large a quality example of effective cooperation; by combining forces the NORDIC countries have a quality network over one of the largest areas in Europe. Funding is provided in part by the Nordic Council of Ministers, with additional funding by participating nets, including NORDIC EUnet, HEPnet, and EARN. NORDUnet is formally participating in the Ebone.

EASInet is a network of sites participating in the IBM-sponsored European Academic Supercomputer Initiative. The roughly 20 participating IBM supercomputer sites use a mixture of SNA (Systems Network Architecture), X.25, and TCP/IP protocols. EASInet links operate at 64kb or higher, particularly when shared with other networks. EASInet has a T1 (1.5 Mb) link to Cornell University in New York.

EASInet is informally participating in the Ebone by allowing access to many of its international lines. Funding from IBM is not committed beyond June of 1992 and the long-term future of EASInet is uncertain.

IXI, for International X.25 Infrastructure, is a pilot backbone network which was developed by the COSINE (see below) project, it's sole funding body. IXI connects national research networks, international networks and public networks at about 20 access points across Europe. PTT Telecom (the Dutch PTT) is the implementor of the service.

During 1992, IXI began to phase in user fees, and plans to eventually be entirely self-funding. IXI is managed by the Cosine Project Management Unit (CPMU), which functions under the umbrella of RARE.

IXI's progress has been weak due to the uncertainty of future service costs, technical limitations, and the relative popularity of IP services. IXI is frequently declared a success; this is bureaucratic camouflage: the low level of service growth seen in IXI pales in comparison to the rapid growth experienced by many other networks.

The COSINE Implementation Phase will be completed at the end of 1992. Thereafter, it is expected to be associated with the RARE OpUnit (see below).

European R & D Networking Associations

The European R & D networking associations and consortia include:

RARE, COSINE, ECFRN, Ebone 92, RIPE, and Internet Society (ISOC).

RARE (Reseaux Associes pour la Recherche Europeenne) was founded in 1986.

RARE members consist of full (voting) National members (representing national R & D nets), non-voting Associate National members, non-voting International members, and Liaison members. EUnet is an International member along with HEPnet, EARN, and NORDUnet.

RARE has a mission to promote OSI protocols, which sometimes causes problems when OSI protocols do not provide appropriate technology or services. RARE further suffers from having become a platform through which the national R & D nets express their national political conflicts. The existence of a pan-European coordinating body is of vital importance. However, RARE's success has been very limited, in part due to these political difficulties

After extensive discussion and planning, RARE has decided to sponsor the creation of an Operational Unit (Op Unit) to provide a 2Mb pan-European multi-protocol (X.25 and IP) backbone, which will connect the national research nets, and possibly other service providers. The Op Unit is expected to be constituted as an independent for-profit shareholding company. However, only some members of RARE are to be permitted to hold shares (the National members), with the total number of shares held by any member to be limited to avoid undue influence by any one group. This membership restriction has alienated a number of the international networks, including EUnet and EARN. The Op Unit will not be limited to simple backbone services; it is expected to pursue high-level services as well. There remains strong concern that the Op Unit, like IXI, will be a vehicle to express industrial policy rather than to satisfy network user needs and requirements. This could seriously hurt networking in the European region.

RARE also functions as the umbrella organization for the Cosine Project Management Unit (CPMU), Ebone '92, and the RIPE NCC. There is a substantial fraction of the networking community which views RARE's support of such organizations as an uncomfortable, even deadly, embrace.

COSINE (Cooperation of Open Systems Interconnection Networking in Europe) is a Eureka project. Its goal is to coordinate the activities of the national R & D networks in creating infrastructure to provide a variety of OSI-based network services.

COSINE has moved very slowly: although initiated in 1986, it took until January 1990 to implement its first project, IXI.

ECFRN (European Consultative Forum on Research Networking) was first called into existence in March 1991, and consists of high-level officials and policy makers in the EC, national governments, and the networking scene. ECFRN has called for the existence of a Steering Group whose goals was to create a consensus on future European networking, especially in the area of implementing a high-speed pan-European backbone network. They have since called for the convening of a high-level group to arrive at a future direction, to found a new single European organization for R & D networking, to obtain network infrastructure funding, and support and extend existing networking.

Ebone '92, or European Backbone, was formed in late 1991 by the international nets (HEPnet, EARN, EUnet, NORDUnet) and several of the national R & D nets to solve their immediate problems of insufficient international infrastructure (that is, RARE was not making real progress) and to ensure that once a RARE OpUnit was formed, that there would be an alternative should the OpUnit not be up to the task. The Ebone is a cooperative, IP-based, contribution-funded backbone network which interconnects service providers. Ebone is up and running today; the total time from first meeting to formal creation was about two months - a truly impressive performance.

Most national and international networks have either joined or are expected to join; CERN and EASInet (IBM) are informally participating.

Although focusing on the research and academic community, Ebone invites commercial organizations to use the backbone. This will improve connectivity in general and will probably reduce the marginal cost of new bandwidth significantly.

It is frequently stated that Ebone is expected to fold into the RARE Op Unit when it is begun in 1993. It is likely that something like this will occur, but there are too many forces in play for this to occur exactly as expected.

Ebone is managed by a Council of Contribution Organizations (ECCO), an Action Team (EAT) which functions as a technical committee with representatives from each organization, and a Management Committee (EMC). EUnet has representatives on each of these committees, including the EMC, of which your author is an active member.

RIPE (Reseaux IP Europeenne) was begun in 1989 by EUnet and others as a forum in which IP activists and network operators could informally meet and compare notes and ideas. At that time, meetings consisted of a handful of people. Meetings continue in this fashion today, but have become somewhat more organized, with 60 people in attendance at each meeting. RIPE functions without a formal budget; in fact, it is nearly administration- and overhead-free; there is no formal membership status.

RIPE supports active working groups in areas such as routing policies. Your author chairs a committee on "Relations Between the Research and Academic Nets

and the Commercial Nets". This committee will be an important lever to open up discussion on issues such as settlement, acceptable-use policies, and resource-sharing by publicly-supported and commercial nets.

RIPE is also special because it does not view itself as strictly a forum of the academic or R & D community; rather, is is open to any persons or organizations which are interested in IP technology. As such, it is making efforts to bring more commercial IP providers into the organization.

RIPE has the status of a project formally approved by RARE (a distinction not always desired).

RIPE has sponsored the creation of a **RIPE NCC** (Network Coordination Center), to perform within Europe many of the same types of functions that have been provided in the US by NSFnet's NIC (Network Information Center). These include keeping a record of IP connectivity in Europe, domain name registration, network monitoring, and information services. The NCC does not have an operational role per se: it will not manage any one network; rather, it will help coordinate the various IP networks in Europe. RARE acts as the administrative umbrella for the NCC.

The Internet Society (ISOC) was organized 1991 to "function as a professional society to facilitate, support, and promote the evolution and growth of the Internet as a global research communications infrastructure". It is an international membership organization with voting individual members and non-voting institutional members. As such, it is not a user organization; but rather a society for technical experts and active participants. It regularly issues an Internet Newsletter, and holds an annual technically-oriented meeting.

ISOC will act as the umbrella organization for the future technical evolution of the Internet, providing support for the Internet Activities Board (IAB), the Internet Engineering and Research Task Forces (IETF and IRTF), and Computer Emergency Response Teams (CERT).

The Commercial Service Providers

Notable commercial service providers in Europe today include:

■ INFOnet
■ Sprint International
■ PTTs

INFOnet is a world-wide telecommunications service provider and joint venture of PTTs in Europe (Switzerland, Netherlands, Germany, Spain, France, Swedish Telecom, and Belgium), the US (MCI), and ASIA (Japan and Singapore).

InfoNet is providing an IP service known as InfoLan, with connection points in many major European cities. These are interconnected primarily by redundant 384 kb links, with some links as fast as 1 mb. InfoLan is to

provide connections to the US and Asia. InfoLan states that they will be able to provide Internet connectivity (assuming that the user meets NSFnet connected status criteria) and e-mail service. InfoLan has not announced plans to provide any other higher-level services.

Sprint International operates many X.25 networks across Europe. In 1991 Sprint was awarded a major contract to provide a pan-European closed corporate network across Europe for the Unilever Corporation. This was a major coup over both the bidding European PTTs and AT&T. The contract includes an option for the provision of pan-European IP services.

Sprint has recently announced a US-wide IP service known as SprintLan. Sprint may eventually make similar announcements in Europe.

PTTs across Europe are looking at moving "up the value ladder" into higher-level services. Several PTTs are beginning to provide services outside of their country of origin. It is likely that, in the long run, we will see PTTs form extensive alliance until they become truly pan-European businesses.

Special-Interest and Amateur Networks

The most interesting and broadest coverage special-interest amateur network is FIDOnet.

FIDOnet is a cooperative, low-overhead, volunteer-staffed network which serves PC users internationally in the US, Europe, Asia, the Middle East and Africa. It is probably the biggest grass-roots network in the world. FidoNet services include e-mail and (usually locally) bulletin-board access. Coordination is provided by the International FidoNet Association, which hosts annual conferences where users may compare notes and ideas.

In Europe, some of the FidoNet systems are supported by commercial organizations and clubs. Anyone with an MS-DOS, Apple, or Amiga machine, a phone line, and a modem may connect. Connectivity is provided by finding a willing local store-and-forward site. Services are free, but unreliable; e-mail can have very long (one day or longer) arrival times.

EUnet has agreed to grant free transatlantic bandwidth to FidoNet for a limited time late at night every day. This EUnet grant yields publicity and good will.

Some Other Key Networks Around The World

The **Internet** is not a single network, but rather a world-wide system of approximately 5000 loosely-connected networks that link approximately 3 million users worldwide. Each network is managed independently. The NSFnet is one of the major backbones of the Internet.

Being "on the Internet" is extremely important; it permits users to access the world's largest system of computers, users, conferencing systems, and data. In the past, the only way to get "on the Internet" was to have permission to exchange traffic with NSFnet, which required a non-commercial, research mission for the connecting network. However, the existence of the Commercial Internet Exchange, or CIX (see below), has begun to change this. Although the situation has not yet entirely been redefined, from a practical view one is "on the Internet" if they have connections to a large fraction of the world IP networks. This can be accomplished, for example, by connecting to either NSFnet or to CIX.

CIX (Commercial Internet eXchange Association, Inc.) was formed in reaction to two problems: first, the problem of interconnecting US network user sites which were not able to obtain NSFnet connectivity; the second, the problem of ANS's apparent attempted domination of US research networking. The founders of CIX were UUnet, PSInet (a regional based in Virginia), and CERFnet (a regional based in San Diego and formed around the supercomputer facility at the university there); newer members include Sprint. CIX established a common point of connection and announced their NSFnet-free connectivity, thus freeing them from traffic restrictions and the need for users to obtain NSFnet connectivity.

CIX members agree to connect to all other CIX members without any settlement costs, as required by the CIX membership agreement. CIX members are actively discussing other settlement models; it is not clear if or when they will arrive at an acceptable solution.

EUnet joined CIX in March, 1992, the first operating European network to do so.

EUnet Reflected

Having now drawn a fairly broad picture of the European and International networking scene, let's look at EUnet in this light.

EUnet shares characteristics of the three major types of networks. It owes its origins and provides services to a large fraction of the R & D community throughout the European region. Like the commercial networks it provides services to many organizations outside of the government-funded world by serving many R & D organizations in companies. And, like the amateur networks, it is still drive by a high degree of technical enthusiasm; this is reinforced by our concept of "universal service": providing network access to users of limited means and in less-developed countries.

ISVs The European Opportunity

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Peter Theobald is a Director of Xi Software Limited from Welwyn Garden City, UK, who specialise in the writing of utility programs and consultancy associated with the UNIX operating system.

Previously Peter was the Managing Director of Thame Microsystems who distributed board and UNIX system level products mainly from Motorola Computer Systems.

Why Independent Software Vendors ?

Computer Manufacturers who sell Open Systems are not able to provide all of the software required by the user themselves. UNIX has become accepted as the operating system for Open Systems and has proved that it will be here for many years to come. Like all operating Systems UNIX does not provide all of the solutions or offer all of the facilities required by the user.

The ISV network has grown up over time from the need of the computer manufacturers to provide solutions to areas of weakness in the initial offerings of hardware or software vendors when addressing various targeted markets.

The ISV as a Specialist

The ISV will have detailed knowledge on a particular area of software and will be able to bring his expertise on that subject to a marketplace which is needing a solution from a particular computer manufacturer.

The computer manufacturer will be looking for ISV's who will be able to help him to penetrate a particular market where he will not have sufficient resources to develop programs covering all of the areas into which his computer will be expected to run. To be cost effective, the computer manufacturer, will need to see a very much larger base of customers for a particular software package than an ISV, who is supplying his product on a variety of platforms, in order to make the writing of that package worthwhile.

The ISV on the other hand will have spent, hopefully, a lot of time producing the package that the market needs, rather than that which he feels that he is technologically competent to produce. His company is likely to be of a smaller numerical size and so more likely to be able to survive on a smaller turnover which will be based on their more specialised offerings.

From our own experience we were in the position whereby a large computer manufacturer was bidding for a contract which was initially expected to be worth in excess of a hundred million Pounds Sterling but needed software from an ISV which was costing only a few tens of thousands of pounds in order to successfully bid for the contract. It was not in the interest of the computer manufacturer to develop that software even if he had the time and the expertise to do so.

Small ISVs

I am addressing my comments to the situation that confronts the small ISV, One with less than, say, 10 employees. The lack of sheer physical size for the ISV presents its own problems. In the initial start up phase the ISV will most probably be working on his own and performing design, development, pre-sales support, post-sales support, sales, marketing, accounts - to name but a few of the functions that will take up his time. He has to develop the product, debug it, port it to a variety of hardware platforms which, despite the claims of binary compatibility, are time consuming.

The various flavours of UNIX likewise will need addressing slightly differently and hence more time will need to be set aside to ensure that the product offered by the ISV will be suitable for the complete range of computers which are available today and in the future.

The small ISV will also find that he will suffer a credibility crisis with some of the larger suppliers and customers. What happens if you cease trading? is one of the questions most commonly levelled at the small ISV. Was this question raised with Rolls Royce in the 70's or the Maxwell empire in more recent times, or any number of companies who have felt the effects of worldwide recession? I would suggest that the answer in the majority of cases was a resounding NO. It is, in any case, easy to deposit source code with an outside body like the NCC to give the customer protection against such eventualities.

Getting Going

The cost of sales is often one of the last considerations in any business plan of the software writer. The optimism he has that the world is waiting for the product that he has nurtured from conception to birth comes high on the list of areas where the ISV can be in error. It does not occur to him that the facilities that are available to the user in the native or a competitive offering may be sufficient to satisfy his immediate needs.

All of the features that the ISV has decided the user requires are of significantly less importance to the user than the ISV would have hoped. It is possible that the facilities that have been designed into the product are very useful and the user will only find this to be the case after he has been using the product for some time. The ISV will have been working with his product for many man months or years and have the misguided idea that the world will have the same comprehension about the product as he has.

Documentation is inherently weak and must be improved if the product is to be successful in a country not sharing the same language. The cost of taking a product into an international market is alarmingly greater than selling in a domestic market. Distances of travel increase to the level where it is uneconomical to drive to the customer in the car - which the cost probably has not been fully allocated in the company accounts, will never need to be serviced or replaced. Travel by public carrier cannot be avoided even though it will be seen to be expensive. An evaluation will need to be made to determine whether a visit to a customer site can be afforded in view of the fact that there may not be an order at the end of the day.

The Open Market

The fact that by the beginning of 1993 there will be no trade barrier for the ISV when attempting to sell his products within a vastly increased "domestic" market will not mean that this market will readily accept the product that is being offered. If the user interface of the software is presented in such a way that it is unacceptable within that enlarged market there will be no additional sales made in 1993 or beyond.

If we take a look at the automotive market we will see that the car which is offered throughout the European Market externally is largely the same. The difference comes in the user interface. Right or left hand drive for example. User manuals will be written in the language of the user. Even in this case, where years of experience have been put into practice and everything would appear to be catered for in the presentation of the product, we do not see a similar proportion of cars from each manufacturer in each member state. Nostalgic pride within nations will cause the product designed in one member state to have a more than equal chance of having the major share of the total available market within that nation. Can we be sure that the same will not apply to computer software?

In computer hardware we see that Siemens-Nixdorf is strongest in Germany, Bull in France, Olivetti in Italy, and ICL in the UK. It has been companies from outside Europe that have proved that they can have a strong base no matter where they are trading in the world. IBM and DEC will be seen to have significant sales in all corners of the globe. They may not be currently enjoying the profitability to which they have become accustomed but they do seem to have the habit of being there when a request to quote is made. They also achieve what might appear to be more than their fair share of success. One reason for this success may be that they have a significant marketing presence in the country where they are attempting to trade.

It will be up to the ISV to forge alliances either with the computer manufacturers or other software vendors to make sure that their presence is felt throughout the enlarged home market.

There are advantages in having a pan European distribution network whereby your products will be marketed throughout the whole of the enlarged "domestic" market thus becoming effectively serviced at a local level. The ISV will need to arrange distribution agreements in each of the member countries or with one company who will have representation covering the whole community. Although this can be expensive and time consuming, experience has shown that time spent in the selection of the right partner is time well spent.

Another approach to the problem of achieving direct representation throughout the European market would be to forge an alliance with other ISV's in other member states who would likewise be looking for partners in the same position elsewhere in the EC. The question of suitability of the product being offered by each of the parties will have to be weighed very carefully. There is no point in offering your products through a third party in this type of arrangement if you have no intention or inclination of being able to offer a reciprocal arrangement. There will have to be sufficient benefit to both parties to ensure that this type of arrangement will work. This method of selling products will not appeal to all companies.

The straight distribution agreement could be advantageous to the small ISV. He may find that it is difficult to find distributors for his products because he is not known well enough in the targeted market or for a host of other reasons. It might therefore be more appropriate for several ISV's to form a marketing alliance in one member state who would then have a range of products which could then be offered to distributors in other member states. Each ISV would loose a degree of autonomy and care would have to be taken to ensure that the parties had compatible but non competing products. This would have to apply for both current products and future offerings.

Past experience also shows that it is possible for a company to distribute products from two manufacturers on a completely amicable basis because there is no conflict, only to find that one of the manufacturers produces a product which is seen by the

other to conflict with theirs. No matter how well you are selling the product from one of the suppliers, suspicion will arise that you are offering the competitive product when you should be offering theirs.

The opportunity for the ISV to increase the size of his business through the advent of the elimination of the trade barriers in the EC at the beginning of 1993 is large. The ISV must however be aware of the pitfalls and the costs. If he gets himself geared up to be able to take advantage of the opportunity he will not be disappointed. If, however, he feels that the elimination of the restrictions will automatically mean that his business will increase, he must expect the shock of his life. Is it possible that there is another ISV, within another member state, who will have a product which is directly competitive with his offering, and the competitor already has his plans in place for taking all of the business which is available to him throughout the EC? One man's gain is another man's loss. Those who are most prepared for the coming elimination of the trade barriers at the start of 1993 will be the ones who will gain the most.

There will not be a cut off date at December 31st 1992 where business in one form will cease and in another form will arise. The process is on-going. Pan European companies have been forming for many years now and are already in the position to take business from all member countries.

The ISV must be aware that their contemporaries throughout the EC will be looking to increase the size of their business by attempting to trade in all of the member countries. This will be easier from the start of 1993. If the ISV does not find a suitable way of moving his products in the expanded domestic market he must not be surprised that his business within his own pre 1993 native territory because there will be other ISV's who will be after the business that he has traditionally enjoyed.

The rewards from trading in an expanded local marketplace are, as we have said, large. The associated costs in terms of travel, development of the product to target a specific language, pre and post sales support can also be large. The cost of ignoring the possibilities of either the potential increase in business or the certainty of loosing that which you have will be even greater. You could loose your employment or even your company.

Good software is expensive to write, difficult to find and valuable to the user. Good distributors are just as difficult to find. We are currently looking for good UNIX software distributors in Europe.

Internationalisation

Bringing a product to the international market

Jean-Charles d'Harcourt
GRIF S.A.
France

Jean-Charles d'Harcourt is Sales and Marketing Manager of GRIF S.A. After having degreed from the European Business School in 1983, Jean-Charles managed large accounts for Bull S.A. and then for digital Equipment France. He is involved in internationalisation since he joined GRIF S.A. in 1990 where he manages the international development of this company.

GRIF S.A is the leading SGML software vendor in Europe. Grif's products are designed to rationalize the corporate documentation environment.

Nowadays a software vendor that wants to develop and get a significant share of its market, no longer has the choice of exporting or not. In fact, exporting has become a question of company survival. the French market, as any other European market limited to one country (in the data processing industry), is too small to provide growth and success. This article will show the problems of preparing software for the international market. It will also explain how a company like GRIF S.A has faced these problems.

Building a leading edge technological software on the technical documentation Unix market requires a large investment (Grif represents more than 60 man years of development). A French software vendor like GRIF S.A. that wants to provide a competitive offering needs to sell in other markets to increase its potential commercial base and pay-off its investment. Therefore, GRIF S.A. has always been involved in exporting. In 1991, total export sales represented more than 70% of its total sales. This situation didn't come about by itself but required three types of specific efforts:

- A cultural change
- Technical developments
- Adaptation of marketing and sales

Let's now focus on those items to explain in more detail what kind of problems arise and how they can be solved.

Exporting Publishing software requires the same effort as selling any other product but as being a complex technology used by end users it involves the culture of the people in the countries and their working habits. For example, punctuation rules are different from English to French as are the layout rules. Hyphenation requirements are more accurate in German than in

Italian. Document formats are also different from US and Europe. A comprehensive knowledge of customer habits and ways of working is therefore required to adapt the software to the countries. I am not speaking here about marketing and promotion which are very different from country to country.

A Cultural Change

In a small, high-tech company, internationalisation concerns all people and so requires them to adapt to foreign contacts, languages, habits and requirements. People need to be willing to adapt and integrate their ways of working, reacting and behaving to people coming from other countries. For GRIF S.A. this cultural change was easy because of the staff profile age and education. Most of the team is composed of graduate engineers working in the Unix environment and who are used to speaking English and who have always had contacts with people from abroad. The average age of the GRIF team is 33 and more than 5 different countries are represented. Still this internationalisation needs greater effort than from an identical company based in Belgium or Germany, where most engineers would speak 3-4 different languages!

Technical Developments

The goal of the software vendor is to provide a multilingual product. A product can be adapted to different languages as cheaply as possible.

What are concerned here are the following: prompts, messages and character sets. Documentation is obviously also a concern but is a separate problem.

Prompts are usually short strings of characters which are fixed and not expected to vary.For example

French version:	English Version:
Ouvrir un document	Load document
Sauver un document	Save document
Rechercher	Search

Those strings of characters are stored in an independent ASCII file that is easily modifiable.

Messages. Changing the error messages and more generally all the feedback messages that are sent to the

user. Those messages are more difficult to adapt because they are usually made of two parts: a fixed part (the reason of the error) and a variable part (depending on the context in which the error occurs). The difficulty comes from the difference of the sentence construction in the different languages.For example

Vous ne pouvez inserer un element "Tableau" ici.
You cannot insert a "Table" element here.

In this example "Table" is what the user wanted to insert here. To solve this problem, the software reads two configuration files at startup time depending upon the language wanted to run the software.

The first file gives the software all the character strings to be used in the user dialogue, the second file gives the software all the error messages to be used with place holder to be filled when needed.

These two files are simple ASCII files and may be edited easily, needing no special skills. Thus in less than half an hour any Latin version of Grif may be built with the help of a native speaking person to translate the messages.

Next step in this process is to adapt character sets. This has been made possible in the product. ISO Latin standard character sets are a part of the product.

Because Grif was built to be an Open System, technical adaptations to make the product international are easy and cheap to do.

Sales and Marketing

Documentation
To provide high quality documentation adapted to the user's culture, it is not enough to translate the documentation as is from French to the foreign language. The work here requires a good knowledge of the product and the publishing rules of the country concerned. It is a business for specialists that needs a large education effort for knowing both the product and its environment. As an example, Grif's user's documentation is first made in English by a British company and then adapted to other languages including French. Of course this operation has to be linked to the translation of messages and prompts to provide a coherent product. Once the product is adapted to the country concerned, the environment of the company has to evolve to face exporting.

Product Support
To be professional, product support has to be provided in the native language of the user. This means that someone answers phone calls in the right language and that the technical questions can be discussed in that language. In the data processing environment English is most commonly used. This means that first level of support (end user) has to be delivered in the users native language. Second level support which usually concerns engineers can be provided in English. This is why local support should be organised in the country.

Commercial Brochures-Promotion
All the commercial environment has to be adapted to each country. The commercial environment includes: tariffs, commercial brochures, promotion, demonstrations and sales. The most difficult item here is to adapt sales strategies and behaviour to each country. Selling Unix Software in the united Kingdom or in the South of Italy needs two different approachs both in the sales attitude and in the distribution channel. this shows the necessity for having a local team or partnership with a company in the country.

Administration
Exporting to a new country requires a knowledge of custom and legal rules to comply to the country's laws. This is a bureaucratic aspect of export that must not be underestimated even in Europe. This covers the country's generic requirements in this domain but when dealing with large companies or administrations the bureaucratic environment is extended to the requirements of each large organisation. For example specific contracts or billing rules. Linked to administration, is the question of currencies and managing exchange rates and different accounts in different currencies. Managing accounts and also the exchange risk needs attention and training.

Conclusion

A software vendor as GRIF S.A. has to export to survive or at least to be able to develop significantly. As said before, attitude of employees is a key to the export success because of the implication of everyone in the commercial process. Luckily in the Open System environment mentalities are already adapted to the abolition of trade barriers. They have already been abolished probably because of education and international networks.

What the single market should provide is limitation in political discrimination between companies of different European origin, decrease in administrative, legal and custom procedures. This will not change very much the environment but will make exporting easier and therefore cheaper. This situation should be favourable for the development in Europe of high-tech companies and give them better changes for exporting outside Europe.

However, it is difficult to believe that the unique market will solve every difficulty and make sales equivalent from one country to another. For example, it is hard to believe that the single market can unify sales and marketing techniques as well as languages to allow companies like GRIF S.A. to sell its products without any adaptation and with the same marketing policy in Greece as well as in Spain or Sweden.

The real challenge for Open System vendors is to continue the process of making products as easily adaptable as possible and to get ready for selling outside Europe to the US and the Far East. This is another challenge, especially for the Far East where products have to be technically adapted and marketing totally rethought.

CONVENTION UNIX 93 - The Exhibition of Open Systems

Sixth Exhibition and Conferences

22 - 26 March 1993

CNIT - Paris La Defense, France

<< Interoperability and Multimedia >>

Convention UNIX 93 : An exceptional opportunity

CONVENTION UNIX 93 will be held from 22 to 26 March 1993, at CNIT, Paris-La-Defense. Sponsored exclusively by AFUU (The French UNIX Users Association), CONVENTION UNIX 93 showroom for open systems will be, more than ever, the point of convergence for the entire profession. Each year, the conference draws Researchers, Manufacturers, Developers, Distributors, and Business Leaders, who come together to take an in depth look at the newest technologies and their applications. The proposed program of tutorials and conference papers, offered in conjunction with the exhibition attracts the world's foremost experts to form an elite audience. This truly unique opportunity to provide your preview of the latest market developments must not be missed !

Two themes : Interoperability and Multimedia

Today's users have increasingly sophisticated operational needs. They want open and advanced solutions which make the full spectrum of possibilities available to them. CONVENTION UNIX 93 promises to clarify and demonstrate the concepts of interoperability and multimedia, from both a technical and economical standpoint, to answer the following questions:

■ What functionalities do interoperability and multimedia provide users and businesses?
■ What advantages do they offer?
■ What are the economic implications?
■ What concrete, demonstrable examples exist today?

Content of papers

The Program Committee is interested in both technical papers and syntheses of different approaches. Papers can deal with users experiences, industry and development strategies, technical innovation from the research world or an overview of principles in a particular area. Proposals will be judged on the basis of quality, originality and appropriateness to CONVENTION UNIX 93 themes. The Program Committee would like papers which address the following topics:

Applications and Interfaces: implementation of standards, ergonomics, collection and compression of video images, image synthesis, animation, scene composition, assisted vision, speech/voice recognition, video or teleconferencing, virtual reality, ...

Tools and Basic services: distributed systems, object oriented databases, communication protocols, toolkits, RPC, ...

Abstracts due by 15 October 1992 and sent to:

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11, rue Carnot
94270 Le Kremlin-Bicetre
France

Telephone +33 1 46 70 95 90
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Lead a tutorial at Convention UNIX 93

The tutorial program gives users an opportunity to increase their knowledge and find solutions to specific problems through lectures on precisely defined topics. The objective is to present the state of the art in interoperability and multimedia implementation. These tutorials are led by national and international experts. Official languages are French and English. Simultaneous translation will be provided.

People interested in presenting a tutorial are invited to contact the Chairman of the Program Committee as soon as possible.

OpenForum-92: Open Systems for a Single Market

"OpenForum" Conference Secretariat
c/o Conference Bureau Royal Dutch Fairs
Postbus 8500
NL-3503 RM Utrecht
The Netherlands

Telephone +31 30 955 466
Facsimile +31 30955 539

"Open Systems are tangible evidence of the benefits which standards and technical harmonisation can offer to users and providers. As you well know, DG XIII has a particular role in this area. We therefore welcome and fully support the OpenForum Conference, organised by EurOpen and UniForum, as a major user-led contribution to the development and spread of Open Systems"

The above citation comes from Michel Carpentier, Director General of DG XIII (Telecommunications, Information Technology & Innovation) of the CEC.

For several years we have said to each other: "OK, this year is perhaps a bit disappointing, but next year UNIX (read Open Systems) will finally break through!" And few will deny that today, in times of a world wide recession - most certainly in our field - the UNIX market still grows.

With the arrival of Open Systems on the scene a silent revolution takes place in the world of automation. Not everybody is fully aware of the two most important aspects of these Open Systems:

- Users are no longer tied to one particular hardware architecture, manufactured by one, or at best a limited number of providers.
- Users have a software architecture at their disposal which allow fundamental changes and additions without much trouble. Particular vendors cannot exercise a monopoly on such changes or additions.

UNIX makes little explicit or implicit assumptions about the underlying hardware. Through the public specification of standardised interfaces between the software layers and towards the hardware itself, UNIX could develop from a small operating system on one simple architecture to a world wide standard operating system on a vast range of architectures, from micro to mainframe. The birth of the first Open System.

Today most providers support UNIX actively as their *only* operating system on their complete range of equipment. Only the largest providers can still afford to maintain their own proprietary operating system (of course only on their proprietary hardware).

In Holland the degree of standardisation of the various UNIX systems is sometimes questioned. It is acknowledged that most systems descend either from AT&T System V or from Berkeley BSD distributions. However, the explicit ban by AT&T on the use of the word "UNIX" in the product names started confusion. Two practical examples may serve to illustrate the point that UNIX is indeed standard and is indeed *the* operating system which offers true portability.

- UNIX now is available on tens of architectures which differ fundamentally. Not only in speed but also in instruction set, memory management, I/O channels and the like. On recent architectures UNIX is in fact not only the dominant but in most cases the *only* operating system that is available. Better "proof" that UNIX is portable to other architectures is hardly imaginable. Organisations can invest in software (under UNIX) and postpone the decision on which hardware platform the software is to run.

- UNIX offers an open software architecture on which applications can be ported from one system to the other. Relational database management systems provide a fine example of the portability that UNIX platforms offer. These database systems comprise some hundred thousand of lines of complicated C-code. Yet providers of those database systems manage portings to other UNIX systems routinely. This demonstrates, of course, that the database systems are written in a truly portable fashion. But it demonstrates *too* that UNIX evidently offers the platform on which large complicated applications can easily be ported.

On 23-27 November 1992 a special event will take place in Utrecht. In depth tutorials on various aspects of Open Systems, particularly for management, a pan-European technical conference with an impressive line-up of speakers in parallel to a "business and strategy" programme and an exhibition will attract some thousand participants from all over Europe and USA.

Key note contributions will be presented by: a representative of the EEC, Arno Penzias (Bell Labs), Doug Michals (SCO), Roel Pieper (USL), Chuck Reilly (OSF) in the business track, and by: Andy Tanenbaum (VU), Ozalp Babaoglu (Bologna), Roger Needham (Cambridge, UK), Edward Lazowska (Washington) in the technical track.

In a time when the single common European market becomes reality, a show which will attract professionals, providers and users on technical and management levels provides ideal opportunities. In specially created "hospitality areas" all groups will be able to meet and exchange views and opinions.

EurOpen Spring 1993 Conference & Exhibition

Sevilla, Spain
3-7 May 1993

## Open Systems from the desktop to the room machine: the new challenge

Conference:

EurOpen Secretariat
Owles Hall
Buntingford
Hertfordshire SG9 9PL
UK
Telephone: +44 763 73039
Facsimile: +44 763 73255
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Exhibition:

UUES Secretariat
c/o Diego Soriano
Padilla 66, 3D
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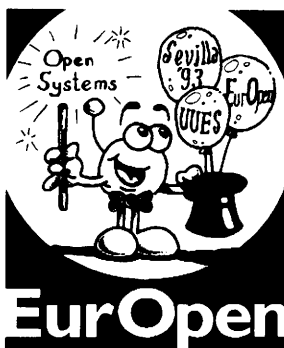
EurOpen

EurOpen Spring 1993 Conference & Exhibition

Seville, Spain

3 - 7 May 1993

The UUES (Spanish UNIX User Group) will host the 24th EurOpen Conference and Exhibition in Seville, Spain, on 3rd-7th May 1993.

Theme of the Seville Conference

"Open Systems from the desktop to the machine room: the new challenge"

Many believe that UNIX can provide a single open environment for machines from desktop size to mainframes and super-computers. However it is uncertain that UNIX will sustain its current moderate penetration in the desktop market, and some commercial DP and MIS departments have been slow to adopt UNIX. Remaining sufficiently open presents a new challenge to the UNIX community.

One of the attractions of UNIX is reputedly the ability to easily migrate applications between various hardware bases. This includes the possibility to migrate from large centralised systems across to distributed client-server environments, including desktop support. Once again, openness and portability are critical issues.

Within the UNIX community itself, there is significant interest in the possibility of small microkernels providing a flexible replacement for monolithic UNIX environments. Such flexibility may be the key to providing growth from small systems to very large ones, particularly multi-computers. They may also be a basis towards openness for non-UNIX operating systems by providing a multi-faceted environment within a single machine.

A consequence of openness in approach is that users can acquire and understand UNIX at limited cost. In practice this not only results from using a desktop, rather than a mainframe, machine, but also from the availability of public domain as well as proprietary software, and low cost UNIX implementations. Training and support must likewise be open, in the sense that they must be sufficiently flexible to meet the highly varied requirements of end users.

Intended Audience

The Conference is aimed at those responsible for procuring and administering open systems, and those who are considering a migration or extension of their computing base towards open systems. It will also be of interest to those promoting open systems technology who are keen to ensure that the interests of users and procurers are adequately satisfied.

Important Dates

25 October 1992	Deadline for receipt of full papers, or extended abstracts, by the Secretariat
29 November 1992	Notification to authors of the Programme Committees decision
29 January 1993	Deadline for receipt of the final paper

The Programme Committee would be delighted to receive paper submissions, or proposals for tutorials, addressing any of the above issues, from a market or technical perspective. Submissions should be sent direct to the EurOpen Secretariat.

CONTACT FOR FURTHER INFORMATION

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E-mail europen@EU.net

USENIX Systems Administration Conference (LISA VI)

Long Beach, CA, USA

19-23 October 1992

This year's LISA conference has been expanded to 5 days (the week of 19-23 October). The conference committee has attempted to gear the program towards system administrators from sites of all sizes, both large and small.

The program will have most of the "features" of the USENIX main technical conferences: a terminal room with access to the Internet, two days of tutorials, three days of technical presentations, an "invited talks" track, Birds of a Feather sessions, a vendor display, and much more.

Preliminary Tutorial Program

Monday and Tuesday
19 and 20 October

The LISA tutorial program will offer introductory as well as advanced, practical tutorials. Courses are presented by skilled teachers who are hands-on experts in their topic areas. The LISA tutorial program has been developed to meet the needs of an audience of novice through experienced computer professionals.

Attend the tutorials and benefit from this opportunity for in-depth exploration and skills development in essential areas of UNX system administration. Combining the two-day tutorial program with the three days of technical sessions attendees the opportunity to learn from experts at a convenient time and at a reasonable cost.

The tutorial program is divided into three tracks of half-day tutorials. Attendees may select from any non-overlapping tracks. Although some prior knowledge may be needed for the advanced tutorials, each tutorial is presented as a stand-alone class (for example, a student may take "X and the Administrator - part 2" without taking part 1 if their knowledge or experience level permits).

The tutorial offerings are usually in high demand, and some sell out before pre-registration closes.

Attendance is limited, and pre-registration is strongly recommended.

TRACK 1	TRACK 2	TRACK 3

Monday AM		
Networking Part 1	Intro PERL	Intro Sys Admin Part 1
Monday PM		
X Admin Part 1	Domain Name Systems	Intro Sys Admin

Tuesday AM		
Networking Part 2	Advanced PERL	New Topics Part 1
Tuesday PM		
X Admin Part 2	Sendmail + IDA sendmail	New Topics Part 2

Introductory System Administration - Part 1

This half-day of intermediate material covers everything you need to know about logins (creating users and manipulating the administration files) and backups (including short descriptions of the various commercial heterogeneous backup solutions). Additionally, the session includes an introduction to the problems of security at your site and the *COPS* security analysis system.

Introductory System Administration - Part 2

This half-day of intermediate material covers setup and operation of C news; setup and operation of your machine room; and set up and operation of the UUCP package for connecting your computer to the outside world.

Networking - Part 1

This first half of the networking track includes an overview of networking and how it works; a description of how packets are switched throughout the internet; an introduction to transporting packets around your site via routers, bridges, and gateways; and a discussion of the new high speed modems and how they can foster fast, inexpensive communication.

Networking - Part 2

The second half of the networking track concentrates administration of users on a network. It includes discussions of the Network Filesystem and its configuration in addition to the use of automounters to reduce administrative overhead on medium and large networks. The last part of the day discusses SLIP, a scheme for using serial lines as a low to medium speed network connectivity tool.

NEW Topics in System Administration - Part 1

The popular "Topics in System Administration Series" continues with all new material for 1993. The first half discusses site maintenance using *rdist* for shuttling files among many systems, how to organize filesystems in large, heterogeneous environments, source tree management for multiple architectures, quick configuration and installation of workstations, and accounting.

NEW Topics in System Administration - Part 2

The second of the the all new material includes: use of daemons to increase privileges of non-root users,

trouble management systems, text processing previewers, console concentrators, NNTP (the network news transfer program which can reduce netnews traffic on your LAN), maintenance of large mail gateways, and electronic mail privacy.

X and the Administrator - Part 1

This tutorial is targeted at system administrators who already know how to use X, but want to learn more about what goes on "behind the scenes." It includes an overview of the different components that make up X Windows (server, clients, different vendor products, etc.). We discuss where the files required to run X are usually located and what they do. We also discuss in detail how to configure a user's environment (e.g., all the different "dot" files and environment variables). We then cover how to administer X terminals and what to look for when buying an X terminal. Finally, we discuss the tasks involved in maintaining the X source code distribution from MIT. There is also a troubleshooting section which includes hints and tips for resolving problems.

X and the Administrator - Part 2

This tutorial builds on the concepts learned in part 1 (or through experience administering X) and includes everything you need to know about fonts: useful utilities, converting between different font formats, and using the X11R5 font server. We include discussions on using *imake* and how to manage multiple versions of X. We discuss some of the security issues associated with X and what you can do to deal with these issues. We also examine how to manage X in a distributed environment with multiple server and host types. Finally, we conclude with some advanced hints and tips for troubleshooting.

The Domain Name System

DNS, the Domain Name System, is a distributed database to handle hostname to IP address lookups and to help in routing mail. This session includes a look at how it arose, the problems of scale it was trying to solve, how to configure it, routine maintenance and debugging. We detail how to set-up includes, establishing primary server configuration, using tools for maintaining the forward and reverse files, configuring a resolver, handling MX records, and a bit about designing a robust name service scheme for your organization.

Introduction to Perl Programming

Perl is a publicly available and highly portable interpreted programming language occupying the large niche between shell and C programming, and as such is excellent for many system management tasks. This tutorial is suitable for individuals who have never looked at Perl before or have only just begun to use it.

Students with a background in UNIX shell programming and regular expressions will benefit most from this course. Topics of this tutorial include detailed descriptions and numerous examples of the syntax and semantics of the language, its data types, operators, control flow, regular expressions, and I/O facilities, and using the Perl debugger.

Advanced Perl Programming:

This brand-new course is designed for programmers already experienced with Perl who would like to expand their Perl expertise about sophisticated datatypes, complex networking, and advanced code conversion. Students with a firm background in both Perl and UNIX C programming will benefit most from this course. Topics of this tutorial include packages to create your own libraries, using pointers to synthesize complex data types (such as list of lists or arrays of records), the bit vector data type and the *select()* system call, using *h2ph* and *c2ph* to convert and access C code, socket programming, the *ioctl* and *fcntl* system calls, and exception handling.

The Instructors

- Tom Christiansen, Convex Computer Corp.
- Trent Hein , XOR Computer systems
- Dr. Rob Kolstad, Berkeley Software Design, Inc.
- Dinah McNutt, Tivoli Systems
- Dr. Evi Nemeth, University of Colorado at Boulder
- Miles O'Neal, Pencom Software
- Jeff Polk, Berkeley Software Design, Inc.

Wednesday - Friday 21-23 October

Technical Program

At press time, the LISA VI abstract deadline just passed. The program committee is currently reviewing over 50 proposals for papers on a variety of topics. We have received a good range of papers, covering most of the topics that were suggested in the Call For Papers, as well as additional ones. The committee is very pleased with the response to the Call and is looking forward to presenting a strong technical program at LISA VI. Here are some of the topics that are likely to be included in the program:

- Tools for Real-Time System Troubleshooting
- Tricks in User Education
- Graphical User Interfaces for System Administration
- Distributed System Administration
- Experiences Using Third-party Administration Software
- Network Growth and Performance Management
- System Security Monitoring
- Evaluating Performance of High-End Workstations and Servers
- Keys to Successful, Painless Upgrades
- Object Management Systems for System Administration

- Standardization of System Administration
- Heterogeneous System Administration
- System Archiving and Backups

Contact Information

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Call for Participation – USENIX Symposium: UNIX Applications Development

Toronto, Ontario; Canada Marriott Hotel

29 March - 1 April 1993

Co-sponsored by the USENIX Association and UniForum Canada.

One of the major uses of UNIX today is the support, development, and execution of applications ultimately used in achieving end users' business goals. The current trends in large end-user organizations of downsizing major applications from older mainframes to less expensive, more powerful, and simpler, modern, networked, machines lend UNIX a serious position in the commercial marketplace. Consequently, more and more computing and information systems professionals are encountering UNIX when developing and maintaining applications.

The purpose of this symposium is to expose the challenges of building and maintaining applications on UNIX platforms, to discuss solutions and experiences, and to explore existing practice and techniques.

This symposium will provide valuable information to designers, programmers, and managers who are planning to port existing applications into the UNIX environment or move development and maintenance teams from proprietary environments to UNIX.

■ Object Oriented Programming - Productivity, languages, techniques, case studies, etc.
■ Object Oriented Databases - Advantages, etc.
■ The Corporate Internet - High Speed for the Elite, or Connectivity for the Masses? ISDN, TCP/IP, OSI, UUCP. Governments, privateers, service providers, co-operatives, telecoms. Network philosophy - open road, tollbooths, freeloaders or lifeblood.
■ Delivering/Installing Applications - What's the best way? How to prevent piracy, worms, viruses, etc. How to do updates effectively and securely.
■ Testing & Certifying Binary Applications - Who does this? What does this achieve? How long does it take? Applications and POSIX.1 Conformance Testing.
■ Standards - ABI/API/ANDF - How, What, Where, When, Why? What are they? How are these standards used? How do they affect applications? What features does each have? What benefits are derived from using each? Where should they be used/followed? When will they be real? How do you keep up with new standards? Why are they necessary?

Suggested Topics

Topics may include, but are not limited to:

■ Graphical User Interfaces - The X Window System - User Interface Design & Standards. Open Look, Motif, NeWS, and so on. What is a style guide? Importance of consistency and ease of use.
■ Porting Issues - Issues surrounding the tasks of porting an existing application to UNIX, as well as issues of making UNIX applications portable to other architectures and other platforms.
■ Networking - Client/Server design issues, etc.
■ Project Management - Using UNIX tools to support project management. CASE - What, When, Why, Who, How.
■ O/S Issues - Overcoming limitations set by hardware and operating systems.
■ Security - The impact of security features. Schemes for maintaining security within an application.
■ Transaction Processing - Implementing distributed transaction processing for UNIX applications.
■ Fourth Generation Languages - What advantages and disadvantages do 4GL's have in a UNIX environment?
■ Distributed Applications - How do you make the best use of existing UNIX functionality (such as e-mail) to build UNIX applications? What are the issues of building and/or using distributed databases?

Other Participation

People interested in participating in panel discussions should contact woods@usenix.org.

Tutorial suggestions to: Dan Klein, e-mail dvk@usenix.org, Telephone +1 412-421-2332

We welcome suggestions for topics as well as request proposals for particular Talks. Interim Invited Talks and Panel Co-ordinator: Greg Woods, e-mail woods@usenix.org

Birds-of-a-feather Sessions: USENIX Conference Office, e-mail conference@usenix.org

Work-in-progress Reports Coordinator: Greg Woods, e-mail woods@usenix.org

All proposals/abstracts are due by 4 December 1992.

Preliminary Announcement and Call for Papers: USENIX Mach Symposium

Santa Fe, NM

19-21 April 1993

Extended Abstracts Due: 4 December 1992

Background

The use and influence of Mach on the operating systems community continues to grow. From its beginnings as a small research project, Mach has spread to become the basis for commercial products from a variety of vendors and a key component of innovative research efforts in both academic and industrial environments. At the same time, research and development continue to evolve Mach itself. The community of researchers and developers working with Mach is proving to be a very productive source of innovative systems.

Activity in this field has been sufficiently wide-spread that the Usenix Association is pleased to once again sponsor a Mach symposium to bring together researchers, engineers, vendors and users of Mach systems. We will encourage discussion of all past and present Mach-related research, development, production and applications activities.

Symposium Overview

The symposium will be spread over three days. The first day will be devoted to tutorials on Mach 3.0, and will include both introduction/overview and advanced programming tracks. These tutorials should be of interest to both those desiring an introduction to Mach, and programmers interested in learning how to take better advantage of Mach features. The following two days will concentrate on presentation of refereed papers on past and present Mach-related work. Long breaks between presentations will provide opportunities for informal discussion. Some time will be available for descriptions of work in progress.

Areas of interest include, but certainly are not limited to:

- Applications and support for programming languages
- Mach 2.5 and related systems (e.g., OSF/1)
- Mach 3.0 and servers
- Mach-based operating system implementation and emulation
- Use of Mach subsystems in other operating systems
- Multiprocessor and parallelization experiences
- Distributed systems, including multicomputers, clusters, etc.
- Real Time
- Security
- Performance
- Productization experiences
- Comparisons of Mach with other operating systems; e.g., Chorus, Sprite, Amoeba, V, and of course, Unix
- Future work

The program committee is especially interested in papers describing applications and/or system servers that take advantage of Mach features in addition to papers describing the evolution of Mach kernel technology. Submissions are strongly encouraged from efforts across the entire spectrum from research projects to product development efforts (including work that falls between these endpoints).

Important dates

Extended abstracts:	4 December 1992
Notification to Authors:	18 January 1993
Camera-ready, full papers:	26 February 1993

For further information about the symposium, contact the program chair:

David Black
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Open Software Foundation
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Program Committee

- David Golub, Carnegie Mellon University
- Alan Langerman, Orca Systems, Inc.
- Jay Lepreau, University of Utah
- Avadis Tevanian, Jr., NeXT, Inc.

UniForum 93

San Francisco, CA, USA

15-19 March 1993

Excitement is stirring at UniForum, the International Association of Open Systems Professionals headquartered in Santa Clara, California, and with its Affiliate Groups worldwide, as it develops significant projects designed to inform, educate and meet the needs of open systems professionals worldwide.

One of these projects is the 1993 UniForum Conference and Trade Show, scheduled for March 15-19 at Moscone Center, San Francisco, California, which has been developed around the theme "Open Systems, Open Opportunities." Manufacturers, system vendors, software developers and end users are all benefiting from increased productivity via open systems, and this year's show is designed to examine exactly how this is happening.

All-day tutorials will be held on March 15 and 16. Conference sessions, including individual presentations and panel discussions as well as technical paper sessions, will run March 17-19 in conjunction with the vendor exhibition.

The five tracks for UniForum '93 include the following:

■ Interoperability: The scope of this track covers both the system and application software aspects of interoperability. Tools and techniques for client/ server applications in the distributed- computing environment will be covered, as will the exchange of information between applications and companion processes that execute on different architectures. At the hardware level, aspects of systems integration used to mix and match systems and peripherals will be covered.

■ Network Computing and Management: This track will explore the relationship between open systems and network connectivity, including both business and technical aspects. It will also cover methods of managing networked systems and applications.

■ MIS and Commercial Issues: This portion of the program will explore the needs of open systems users within traditional DP/MIS areas, as well as business and other non-technical user environments. The primary focus will be management issues and technology strategies.

■ ISVs and Dealers - The Distribution Channels: Key issues for independent software vendors and dealers will be examined, including technical management

issues and product marketing concerns.

■ Architectures and Applications: This track covers long-range implications of architectures and their effects on applications. Management strategies and technical aspects will be examined.

Along other fronts that are developing for 1993, UniForum is responding to the great need for information about internationalized software with the publication of a technology guide entitled, "Internationalization Explored." With the world becoming increasingly smaller and the demand for software increasing, it is more important than ever to understand the need for programs that are not culturally biased.

"Internationalization Explored" describes a programming model software vendors can incorporate that offers the flexibility needed to meet users' differing cultural requirements. Other topics examined include various writing systems and alphabets, including language- specific and country-specific conventions; the importance of internationalized software in the design process, creating non- country specific code at the beginning of design versus customizing existing software; how to create internationalized programs; and the future of internationalization.

In other publication news from UniForum, the 1993 UniForum Products Directory has been redesigned in three volumes with more graphics and enhanced listings. Called "the most comprehensive guide to UNIX products ...that's easy to use" by UNIXWorld magazine, the newest directory will be larger than last yearUs, which featured more than 7,600 products from 2,097 vendors. The new directory will also be the only source for XPG compliance information.

Other new publications from UniForum will be out in 1993, and interested readers are encouraged to contact the organization for further information at

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Report on the April 1992 IEEE POSIX Meeting for EurOpen

Stephen R. Walli
EurOpen Institutional Representative

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Stephen (Stephe) Walli has been buried in the IEEE POSIX process for nearly three years now. Between being the USENIX Standards Report Editor, the EurOpen POSIX Representative, and the ISO Monitor, he tries to find time to do his "real" job, and spend time with the three women who rule his life at home. He's still trying to find a picture of himself worth printing.

While EurOpen members were hopefully enjoying the sites of Jersey, UK, I was not enjoying myself some more at IEEE POSIX meetings. Meetings, meetings, meetings, and more meetings.

Meetings start at 8:30 am Sunday morning, and for the next three days you can be stuck in meetings for 12 or 13 hours a day. Wednesday offers a brief respite (being only about 9 or 10 hours), but Thursday invariable lasts until 9:00 pm (on a good night), and by Friday, everyone's brain is mushy. (This is your brain. This is your brain on POSIX. Any questions?)

If you attend POSIX working group meetings to work on a particular draft document, you likely spend 8 or 9 hours a day (starting Monday) in that working group's meetings or in the computer facility madly creating the draft document. The extra time, before 9:00 am and after 4:00 pm is tied up with all of the various steering committees, subcommittees, and co-ordination meetings.

The IEEE Technical Committee on Operating Systems - Standards Subcommittee (TCOS-SS) is the organisation responsible for developing POSIX. It is governed by the Sponsor Executive Committee (SEC), which is made up of all the SEC officers, working group chairs, institutional representatives, and the steering committee chairs.

Steering committees are organised when there are issues and concerns raised across working group boundaries, that need work and resolution. Currently, the following steering committees exist:

- Distributed Services Steering Committee (DSSC)
- Steering Committee on Conformance Testing (SCCT)
- Steering Committee on Windowed User Interfaces (SCWUI)
- Profiles Steering Committee (PSC)

Furthermore, subcommittees are formed out of the membership of the SEC to address issues which do not require the full attention of a steering committee, and are of more concern to the members of the SEC itself. Two such committees are of particular interest.

- Project Management Committee (PMC)
- System Interface Co-ordination Committee (SICC)

Many of decisions which effect POSIX as a whole come out of these co-ordination groups, and the rest of this report reflects the April 1992 meeting through a number of them.

Sponsor Executive Committee

The SEC is the governing committee of the POSIX working groups. It meets twice during the week of POSIX meetings. One of its primary responsibilities is the approval of new project authorisation requests (PARs) to be forwarded to the IEEE Standards Board. The rest of the meeting is dominated with steering committee reports, liaison reports, administrivia, logistics, and policy work.

This week was relatively quiet. The SEC has been dominated in the past by hours of interminable discussion on such joys as the GUI projects. No such fun this time.

A painfully long discussion presented and word-smithed a position statement from the Distributed Systems Steering Committee to be forwarded into the ISO world, as there are a number of TCOS projects which do not clearly come forward to ISO's JTC1/SC22/WG15 (ISO POSIX). These are all communications related projects.

The Mass Storage Systems Standards Committee, a peer group in the IEEE hierarchy to TCOS-SS, presented an overview of P1244, which is defining a software interface between the file system and the underlying storage system. We still aren't sure whether we wish to liaise closely with this work or not. It seems just distant enough from the POSIX realm.

Steering Committee on Conformance Testing (SCCT)

The SCCT is essentially the "grandfathers" of POSIX.3 (IEEE Std. 1003.3-1991 - POSIX Test Methodologies.) They are responsible for helping other working groups develop test methods for their draft documents, using the POSIX.3 methodologies. All IEEE POSIX standards require test methods to be completed before exiting ballot.

The SCCT Chair is Roger Martin (NIST), who is also the chair of the ISO WG15 (ISO POSIX) Rapporteur Group on Conformance Testing (RGCT). Roger, acting as his own liaison, discussed some of the current ISO issues.

There is a strong feeling within ISO right now to move the IEEE POSIX.3 standard into ISO and begin moving the POSIX.3.1 (Test Methods for POSIX.1) document forward as well. The RGCT was supposed to have met during the Spring, but was unable to, due to lack of committed attendance. This meeting should take place prior to the IEEE and ISO POSIX meetings in October, 1992.

Roger also reported on current NIST activities. FIPS 151-1 certificates are continuing to be awarded (at a rate of one or two per week.) (FIPS 151-1 is the U.S. government specification of the POSIX.1 standard, calling out the options and limits NIST requires for POSIX.1 procurement.) FIPS 151-2, an update of the FIPS 151-1 document, should be out for review in September 1992. NIST also wants to get out of the POSIX test suite business, and is hoping a co-operative development effort of some form will take on the work of building a POSIX.2 (Shell and Utilities) conformance test suite.

Profiles and the Profiles Steering Committee

There are five POSIX projects which are considered profiling projects. These projects are attempting to map onto the base POSIX systems API, and point to other appropriate standards, and come up with a generally useful POSIX based definition of an application domain profile. The groups immediately hit a number of problems. Some were stylistic (all five draft documents look different.) Some are technical. (Can a profile subset the functionality in a base standard?) Some were timing oriented. (How does a profile point to a standard that is still only a draft document in ballot?)

POSIX.0, the Guide to Open Systems Environments, and supposedly a proponent of profiles, refused to answer the hard problems for the profiling working groups early in their history. In April 1991, the Profiles Steering Committee was formed to attempt to solve the problems. Unfortunately, their terms of reference allowed them to wander off looking at the big international scene. They are only now trying to complete a set of "rules" for writing profiles. This under extreme pressure.

The PSC is not defining a taxonomy. They feel a profile needs to set up some context, but there probably doesn't yet exist a global reference taxonomy. They are sufficiently aware of some of the work being done by the European Workshop on Open Systems's Common Application Environment Working Group, a CEN/CENELEC sponsored body, that they hope it will fulfill this need.

The Profiles Steering Committee tried to have the Sponsor Executive Committee pass a resolution to have the PSC become a critical point in the working groups' paths and have the documents only pass as trial-use standards. This failed, and the PSC will be under the gun to get their act together by the July meeting.

The Project Management Committee

The PMC is a subcommittee created to "manage" the POSIX project. It's primary responsibility is to review new project authorisation requests (PARs) to ensure they are clear and complete before passing them onto the SEC for approval, and reviewing existing projects to ensure that all is going well. They do this by setting up project mentors. Two projects saw a lot of attention at this meeting.

POSIX.6 (Security Extensions) seems to be having some trouble. They were supposed to be forwarding new PARs to the PMC to break up the existing document into appropriate sections, and add new work: security interfaces extensions (delta POSIX.1), super-user security extensions (delta POSIX.2), identification and authentication (delta POSIX.7), portable data interchange (delta POSIX.7), and a secure General Terminal Interface (delta POSIX.1). This reasonably straight forward administrative job went unattended, despite the fact that the POSIX.6 project mentor works literally down the hall from the POSIX.6 chair.

POSIX.6 is also struggling with technical issues. Generally, a working group should stand fairly solidly behind its draft document as it goes to ballot. If the working group that built the document is not 90% behind it, you can presume the balloting group will contain the working group, and you have instantly built in ballot objections!

POSIX.6 had a considerable number of objections from its own working group when it did an internal mock ballot. These were not all corrected. Now that the document is in ballot for real, there are about 3400-3800 objections. While this may not be a record, (POSIX.2 had more,) it is certainly the highest ratio of objections per page!

The P1238 Working Group is another TCOS-SS project which saw a lot of attention this week. They are defining OSI FTAM service descriptions. The P1238.1 project is also assigned to the P1238 working group, and it will be the API to those P1238 defined services.

The problem is that the P1238 working group is having trouble maintaining a sufficient head count to get its original work done, let alone start the P1238.1 API

work. The Project Management Committee mentor for P1238 suggested that the Sponsor Executive Committee should withdraw sponsorship of the P1238.1 project request, and if the group continues to have problems in July, withdraw sponsorship of P1238 as well.

The U.S. Navy has sent a representative to the room this meeting and is trying to argue that they support the work. X/Open is muddying the water, suggesting that they have "industry support" for the XFTAM API and service descriptions, and that they are not quite the same.

The group is being allowed to continue until July. If there is insufficient head count, the recommendation will be made to pull the plug. This is a good thing. If it truly is a useful standard, then the industry (both users and vendors) should care enough to support defining it, and show up to do the work.

Systems Interface Co-ordination Committee (SICC)

The SICC exists to do the work implied by their title. All the base standards working groups, POSIX.4 (Real-time), POSIX.6 (Security), POSIX.8 (Transparent File Access), POSIX.12 (Protocol Independent Interfaces), POSIX.15 (Batch Interfaces), and POSIX.17 (Directory Services), will eventually merge on top of the ISO/IEC 9945-1 (POSIX.1) standard. (Think about that for a moment, with all the attendant options and extensions.)

This merging has already begun finding all kinds of little problems, as one document or another attempts to merge against POSIX.1. The SICC exists as a place for all the key working group chairs to resolve these issues.

One of the primary discussions at the April meeting was the re-organisation of POSIX.1. Currently, there are historically strange things in the standard's organisation. For example, the open() and close() functions appear in different chapters. The POSIX.1 functionality is about to be re-balloted as a programming Language Independent functional Specification (LIS) and a C language binding (POSIX.16) to it. These two documents together (POSIX.1/LIS and POSIX.16) are intended to be identical in content to the existing ISO/IEC 9945-1:1990.

The technical editor of these documents wishes to re-organise them to reflect a more logical grouping of functions. This was generally thought to be a good idea by SICC. It really is the best opportunity to do this now. The only real concern was that a re-organised 9945-1:1990 (without rationale) should be circulated to the balloting group as well, so that they can clearly see the correlation.

ISO Monitor Report on the May 1992 ISO POSIX Meeting

Stephen R. Walli
EurOpen Institutional Representative

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Stephen (Stephe) Walli has been buried in the IEEE POSIX process for nearly three years now. Between being the USENIX Standards Report Editor, the EurOpen POSIX Representative, and the ISO Monitor, he tries to find time to do his "real" job, and spend time with the three women who rule his life at home. He's still trying to find a picture of himself worth printing.

Overview

The International Standards Organisation (ISO) and the International Electrotechnical Commission (IEC) jointly develop international standards for information technology. The family of IEEE standards known as POSIX are being brought forward as international standards.

The ISO view of this process is that the standards are being developed by a national body (U.S.) instead of the more traditional model of ISO working group development. (Similar national body development is going on for C++ in JTC1/SC22/WG21 which meets jointly with ANSI sponsored X3J16.) The IEEE forwards work through an ANSI sponsored Technical Advisory Group (TAG), to ISO/IEC JTC1/SC22/WG15. This frightfully long agglomeration of acronyms stands for ISO/IEC Joint Technical Committee 1 (JTC1), Subcommittee 22 (SC22) on Programming Languages, Working Group 15 (WG15) on POSIX.

WG15 (as we shall refer to it) helps guide the IEEE documents as they come forward as ISO standards. Direct development of the documents does not happen in WG15, but rather it acts as a focal point for international comment and much of the liaison work that is required to ensure that the IEEE documents will be able to stand as ISO standards.

The point of the process is to develop a single standard which does not diverge from the IEEE counter part. The groups have succeeded to date, with the base operating system API embodied by IEEE Std 1003.1-1990 being identical to ISO/IEC 9945-1:1990 with the minor exception of the plain white ISO book cover. The IEEE Standards Press even produces the ISO book, and they do so on A4 paper no less!

The WG15 projects are organised into three standards: 9945-1 represents all of the operating system APIs, 9945-2 represents the shell and utilities, and 9945-3 will be the system administration functionality.

Currently, the IEEE POSIX.4 (Real-time), POSIX.6 (Security), and POSIX.8 (Transparent File Access) documents are all somewhere in the WG15 review-and-comment process. These documents will all be rolled (as programming language independent functional specifications) into 9945-1. POSIX.2 and POSIX.2a will become 9945-2 in the (relatively) near future. POSIX.7.1 (Printer Administration) is making its debut on the ISO WG15 scene this meeting in a very informal way, as the WG15 members were encouraged to join the initial mock ballot. This book will eventually become part of 9945-3.

The last thing worth mentioning before getting into the report of this meeting is the group itself. There were 21 attendees. (The IEEE typically has around 350 attendees.) This number is a little low, as we were meeting on the other side of the globe in New Zealand. These 21 people represented 9 countries (one country gets one vote.) The size of delegation is always fun to note. (Please see the table.)

Country	Count	IEEE Overlap
U.S.	4	4
Canada	4	2
England	2	2
Germany	1	1
France	1	-
Italy	1	-
Japan	1	-
Denmark	1	-
New Zealand	4	-
Officers	2	2
9	21	11

The officers are the convener (Jim Isaak, U.S.) and the project technical editor (Hal Jespersen, U.S.). The overlap is also interesting. Jim Isaak is both chair of the IEEE Technical Committee on Operating Systems - Standards Subcommittee (TCOS-SS), the group responsible for building the POSIX documents, as well as ISO WG15 convenor. Hal Jespersen is also TCOS-SS Vice Chair of Technical Editing, and chair of IEEE POSIX.2 (Shell and Utilities).

The other American delegates are all voting members of the TCOS-SS Sponsor Executive Committee as well, representing the Chair of IEEE POSIX.1, the Chair of the Steering Committee for Conformance Testing, the Uniforum Institutional Representative, and Vice-Chair of Logistics. One of the English delegates is Chair of POSIX.7 (System Administration). The German delegate is Vice Chair of POSIX.6 (Security). One of the Canadians (the author) is the EurOpen Institutional Representative.

This overlap proves useful since the size of IEEE POSIX (approximately 350 members) makes it almost impossible to completely overlap the WG15 and IEEE TCOS-SS meetings, as the C++ people do. There just aren't enough hours in a day for all the co-ordination meetings. The best that can be currently done is to run one WG15 meeting a year right beside an IEEE meeting. WG15 meets twice a year. TCOS-SS meets four times a year.

The next WG15 meeting will be in Reading, U.K., October 27-30, 1992, following the IEEE meeting in Utrecht, NL, October 19-23.

Enough of this didactic rambling. On to the report!

The Meeting

This meeting was held in Hamilton, New Zealand, as WG15 travelled to the far side of the globe in the hopes of encouraging future participation from New Zealand. Before everyone starts the "exotic locations" routine, let me point out it is 19 hours by plane for someone from the East coast of North America, with a brief (2 hour stop) in a transit lounge. Our accommodations were undergraduate (!) dormitories at the University of Waikato, who hosted the meeting. You remember undergrad dorms, a bed, a desk, a narrow aisle between them in which to dress, and the W.C. down the hall. The cafeteria (!!) food wasn't all that bad, but....

POSIX.2

One of the primary accomplishments of the week was the acceptance of POSIX.2 (Shell and Utilities) and the POSIX.2a (User Portability Extension) as a Draft International Standard (DIS). Through the hard work of Hal Jespersen, as chair of POSIX.2 and the project technical editor of both the ISO and IEEE working groups, WG15 was able to settle on a draft of the documents which met with everyone's approval.

The POSIX.2a User Portability Extension (UPE) is an amendment of the base POSIX.2 document. The two will be rolled together now.

With a little luck and optimism, the schedule should work something like this:

Summer, 1992 - Final recirculation of the two documents in the IEEE balloting group. This will be similar to the final editorial circulation of POSIX.1a as a reformatted IEEE Std. 1003.1-1988, just prior to becoming IEEE Std. 1003.1-1990 and ISO/IEC 9945-1:1990.

September, 1992 - the two documents come forward to the IEEE Standards Board for final approval as IEEE standards (IEEE Std. 1003.2-1992).

Fall, 1992 - The combined book (approximately 1400 pages!) will be recirculated for one last ballot at the international level. This ballot changes 9945-2 from a DIS to a full International Standard (IS).

Because of its sheer size (volume?), there will still be ballot objections. There is just too much being covered to not have people who are happy with all of it. There are still areas which have demonstratable problems. These can and will be fixed in future amendments. We are finally down to the wire for a document that because of the breadth of its coverage has been in ballot for four years. The community is finally going to get the companion standard to 9945-1 (POSIX.1) that it wants and needs.

LIS

One of the requirements placed on the IEEE working groups forwarding API documents as standards to ISO, was that they be forwarded as programming language independent functional specifications (LIS), with at least one language binding. The intent of this method is to allow other languages to bind to the functional specification in a manner most natural to the language, and not merely re-cast the original standard's programming language syntax into something in a new language. (No one wants to propagate the GKS API that demonstrated that one could write Fortran in any language.)

There is currently an LIS version of POSIX.1, with a C-binding. This was built from the original C-based 1003.1-1990. (These documents are referred to as POSIX.1/LIS and POSIX.16.) They are about to go to IEEE ballot this Summer.

Originally, these two new documents were to be an exact mapping to 1003.1-1990. The organisation of the original left a little to be desired. The *open()* function and the *close()* function are in different chapters. At the New Zealand meeting, WG15 voted to allow the POSIX.1/LIS and POSIX.16 technical editor to re-organise the work based upon a new organisation agreed to by all.

Additionally, it was agreed that small bug fixes should be allowed to the documents. The timing of ballots is such that it could be a long time before another round of changes comes along to "fix" the POSIX.1 book.

A concern was raised that we are opening a nasty hole into which many things will find their way. Bug fixes and wording changes (based on interpretations) are small. New functionality is not. This is something that the balloting groups will have to watch out for. As help for the balloter, two things will be added to the balloting package.

A mini 1003.1-1990, without the rational and annexes, and re-organised to the new sections will be sent out to allow balloters to see how the LIS and C-binding align with the C-based original.

A list of all changes for bug fixes will be sent to allow balloters to quickly locate material that has actually changed in content from the C-based original.

A request has been made by ISO SC22/WG11 (Language Bindings) to bring the IEEE TCOS-SS Guidelines document, that describes how to build LIS and language bindings, forward as an ISO Technical Report. The new work item request will be brought forward in the Fall meeting.

Profiling Activities

POSIX profiling work is continuing to gain acceptance in the WG15 arena. Profiles are seen by some to be the way that all the open systems standards will be put together to form coherent working environments.

WG15 has created a Rapporteur Group for the Co-ordination of Profiling Activities (RGCPA) to handle activities relating to POSIX profiles within ISO. (Rapporteur groups are a essentially a formal special interest group within an ISO Working Group, which acts as an official point of co-ordination.) RGCPA has met twice now, once last Fall and again in January.

The terms of reference for the group were established at this meeting. The RGCPA's most important role will be as a liaison point for other profiling activities within the open systems world.

The European Workshop on Open Systems (EWOS) has done some good work in determining just how to build useful profiles. Luigi Bertuzzi, representing Italy at this WG15 meeting, has been involved in this work and presented it to WG15. The EWOS work involves a number of steps to help shape a functional profile from user requirements, applying standards only as the last step. It does not try to cram user requirements onto standards, nor make the mistake of assuming the standards represent user requirements. The IEEE POSIX.0 (Guide to Open Systems Environments) also contains profile related work. This document is about to be balloted at the IEEE level. POSIX.0 is to be brought forward as an ISO technical report as well. This WG15 meeting was the beginning of that process.

Internationalisation (I18n)"

Internationalisation (i18n) is an obvious interest to an ISO standards body. WG15 created a rapporteur group on i18n for POSIX early on in its existence. WG20 is another SC22 (Programming Languages) working group which concerns itself with i18n issues with respect to programming languages in general. Keld Simenson (DK), as a member of both groups, acts as the liaison in both directions between the groups.

[One member quietly suggested we should really be concerned with intergalacticalisation. The two of us quickly coined the term "i20n". When we make first contact, remember, you heard it here first.]

WG15 forwarded a liaison statement to WG20 (Internationalisation) One of the important points of the statement was the recognition of the fact that while internationalising an application is a good thing to do, and a common portable method of doing so is a good thing to have, internationalising an application probably reduces its portability. One can very quickly add a lot of requirements to the portability of an application by internationalising it.

EurOpen Software Distribution

E-mail europen-tapes@EU.net

Here is a list of the EurOpen software distribution tapes which are available through Owles Hall. Please use the order form on page 58.

Please note that QIC150 tapes are available as a (preferred) alternative to QIC24 (DC6150 tapes, rather than DC600) at the same price as the QIC24 release.

The production methors for the tapes is under review, and the backlog of orders will be cleared soon.

EurOpenD1 R6:
UNIX V7 system, specially made for small DEC PDPs (11/23, 11/34, etc.). The Kernel supports the UK terminal driver. You need at least a source licence for V7 to obtain this distribution. The tape is PDP-11 bootable format, so take care. (No cartridge version available.)

EurOpenD3:
"Starter Kit" aka "Budapest, autumn 1991 conference tape". The tape contains many public domain mail, news, networking utilities, tools, attributes and information. It is THE tape for all who want to share in the joy of really feeling connected to the world in general, and the Unix TM world in particular! Programs you will find on this distribution are:

mail:	mh, elm2, sendmail (5.61 currently), smail, ida, mailway
network:	ka9q, snmp, uupc, uucp over x25
news:	bnews, cnews, nn, nntp, rn, vms, tmnn
gnu-tools:	gawk, grep, make, mh, tar
docmentation:	iso3166, ethernet-info, several RFC's
misc:	kermit, tn3270, vacation

A note on documentation. It is our intention to have National Groups supply information for the tape, in the local language, about how their network is set up, how to connect, what is and what is not (yet) possible, and some further guidelines. As we still have to build this database of local information, it will (hopefully frequently) happen that this Starter Kit distribution will be kept up to date and incorporate new software and documentation over time. This of course depends largely on the amount of time I can make available for this and how input the local groups give. I will do my best.So far I have only had one serious contribution! Dave Gray, from the University of Surrey, who was so kind to supply a small user guide for Unix, which they

hand out to their new students. It's is a little bit targeted to the specific situation at the University of Surrey, but I'm sure it will be of help to others. At least as a starting point in making their own user guide. Thanks Dave.

EurOpenD4:
Software tools, sampled (in 1982) by the Software Tools Users Group. Most of the software is written in Ratfor, for which a Fortran support tool is included. This tape is available in different formats: DEC RSX, DEC VMS, UNIVAC, IBM MVS, UNIX tar, MIT line feed format, and MIT card format (80 columns).

EurOpenD5:
Currently not available. See tape EurOpenD20 for new benchmark software.

EurOpenD6:
(USENIX 83.1) USENIX tape, containing contributions from various UNIX System Group Members. Created in 1983. This is a licence dependent distribution: V7, V32, SIII, V6 or no licence disclosure available.

EurOpenD7:
UNIX|STAT Version 5.2. A collection of about 25 data manipulation and analysis programs written in C by Gery Perlman (1985).

EurOpenD8:
A collection of useful software, based on the so called Copenhagen tape (EurOpen UNIX conference autumn 1985).

EurOpenD9:
A collection of useful software, based on the so called Florence tape (EurOpen UNIX conference Spring 1986).

EurOpenD10:
MMDFIIb. Multichannel Memo Distribution Facility (version IIb). This is a powerful, domain oriented mail system with access control and the ability to communicate over a variety of network systems including TCP/IP, JANET, UUCP, PHONENET, etc. It has been ported to a variety of UNIX's including but not limited to 4.[123] BSD, 2.9 BSD, System III/V on a variety of different hardware. You should first obtain a licence agreement by sending a message to euug-tapes@EU.net. Return the signed licence with your order.

EurOpenD11:

This is the 'Boat' tape; the Helsinki EurOpen 1987 spring conference. It contains about 25 Megabytes of programs, games, etc. Including: jove, less, nag, news, rn, uEmacs, uuencode and larn.

EurOpenD12:

This is the Dublin EurOpen 1987 autumn conference tape. It contains about 26 Megabytes of programs, games, etc. Including: copytape, crc_plot, fastgrep, jove, kermit, notes, uupc, nethack, cron, sendmail, mh, Recipes, brl-gw, isode, pcip, pctelnet.

EurOpenD13:

The conference tape for the London EurOpen 1988 spring conference. It contains, amongst others, the following items: cake, chat, config, copytape, graphedit, kermit, little- st, mcc, mstools, news, pd-diff, pdtar, perl, postscript, psfig, pshalf, shar, rpc, moria4.85, omega, arc, backup, smail, sush, watcher, and more.

EurOpenD14:

ISODE. This is version 7.0 of this non-proprietary implementation of some of the OSI parallel protocols suites as defined by the International Organisation for Standardisation (ISO), the International Telegraph and Telephone Consultative Committee (CCITT), and the European Computer Manufacturer's Association (ECMA). This release is coded entirely in C, and is known to run under the following operating system without kernel modifications:

BSD 4.2 and 4.3, Ultrix, AT&T UNIX SVR2 and SVR3, AIX, HP-UX, ROS, Pyramid OsX

Since a Berkeley UNIX system is the primary development platform for ISODE, the documentation and source are somewhat slanted towards that environment. The tape contains some 12Mb of both tools and documentation in machine readable form. The EurOpen will send you a tape only. Documentation is available on the tape in PostScript format.

EurOpenD15:

The complete X11 Windowing system, as distributed by MIT, release 5: X11R5. Do to the vast growth in user contributed software, this distributions now totals 80 Mb in compressed form. This results in two 1/2", 9-track tapes, and one 450 ft, Qic-24, 1/4" cartridge tapes. Thisdistribution includes the core system, as well asall the contributed software as supplied by MIT. No patches are supplied, however.

EurOpenD16:

This is the Brussels EurOpen 1989 spring conference tape, and consist entirely of software from the GNU project from the Free Software Foundation. Last update: autumn 1990. On this tape you will find: ispell, g++, awk, gcc, gdb, Cscheme, emacs, lisp-manual, libg++, binutils, bison, ghostscript, gas- dist, gawk, gnews, gnuchess, make, oops, pace, ps-emacs, scheme, sed1, tar and torture.

EurOpenD17:

This tape contains the software for ET++. From the abstract of the "Autumn 1988 EurOpen Conference Proceedings": "ET++ is an object-oriented application framework implemented in C++ for a UNIX environment and conventional window system. The architecture of ET++ is based on MacAPP and integrates a rich collection of user interface building blocks as well as basic data structures to form a homogeneous and extensible system." It totals some 18Mb of software that the people of the Institut fuer Informatik of the University of Zurich were so kind to let us, mere mortal souls, play with. Have fun.

EurOpenD18:

This is the "Vienna EurOpen 1989 autumn conference tape", and consists entirely of games! There is a SUN specific set, a set for the X Windowing System environment, and a general useable set. All the games supplied are working, and have been tested at CWI by our "Games Keeper <play@cwi.nl>". For many games he added additional features, not found in the originals. Some of the games included are: for SUN: Asteroids, Mahjongg, Othello, Qix, Sdi, Tetris. For the X environment: Xtrek, Xgo, Xwanderer, Xrobots. General games: Nethack, Adventure, Atc, Empire, Reversi, Yahtzee, Trek73, Backgammon, Corewars, MazewarsV, Vtrek, and lots, lots more.

EurOpenD19:

This is the "Munich EurOpen 1990 spring conference tape", and consist entirely of graphics material. Conversion programs, display tools, toolkits to build you own display program, and off course images.

EurOpenD20:

This tape contains benchmarking software and is named "AFUU/SSBA 1.2, benchmarks". The French group have done a good job creating a tape with all the necessary tools, so you can finally bring your machine down to it's knees, and see what it is really worth.

EurOpenD21:

This is the "Nice EurOpen 1990 autumn conference tape", and consist of a number of different kinds of software, like: dtree, abc, new versions of various mail and news utilities, and PP5.0.

EurOpenD22:

This is the "Postman Pat PP5.0" distribution. PP is a Message Transfer Agent, intended for high volume message switching, protocol conversion, and format conversion. It is targeted for use in an operational environment, but may also be useful for investigating Message related applications. Good management features are a major aspect of this system. PP supports the 1984 and 1988 versions of the CCITT X.400 / ISO 10021 services and protocols. Many existing RFC 822 based protocols are supported, along with RFC 1148 conversion to X.400. PP is an appropriate replacement for MMDF or Sendmail.

EurOpen D23:

The "Tromsø EurOpen 1991 spring conference tape". Also as the "Network" tape. On this distribution you will find a large number of programmes having to do with networked environments, like" amd, athena, routed, python, ftp, telnet, ncsatelnet, osi, pcbridge, pcip, pcrout and some other little gadgets.

News from the EurOpen Working Groups

Keld Jörn Simonsen

E-mail keld@dkuug.dk

Hello fellow EurOpen people!

First some news in general from the EurOpen Working Groups. Jean-Michel Cornu has resigned as the EWG coordinator, and I have temporarily taken over. The EurOpen executive is looking for somebody to do the work on a longer term, as I have too many other things to take care of. Any suggestions will be greatly appreciated. Please contact Frances Brazier on this matter <frances@cs.vu.nl> .

There will be an EWG day during the Utrecht Openforum conference, more on this to be announced on the EWG mailing lists.

Now to news from the groups themselves.

EWG-cprght

The EWG on software copyright is still alive, but not very active. This could well be due to the fact that there are not too many people in the group, and that copyright issues are obviously not the main interest of us. Still, we should be able to come up with at least a standpoint on software copyright issues in the near future.

In the meantime, more people are always welcome. People who could give input from a legal point of view are especially welcome.

EWG-i18n

The internationalisation group met during the Jersey conference, and it was decided to produce a document with POSIX locales covering each of the EurOpen member group countries. There were 7 countries present: France, Algeria, Tunisia, Sweden, Iceland, Denmark and Russia. A draft will be sent to all NALUUGS (National Unix User Groups) during the summer period, with example locales for as many countries as possible. The results will be discussed in the EWG meeting during the OpenForum conference in Utrecht, where we hope to have almost all NALUUGs represented. The result is planned to become an EurOpen standard.

The other groups have not been active - maybe because of the seasonal holidays - but people are always invited to hear more and join the groups. They are:

- EWG-bench for UNIX/POSIX benchmarking
- EWG-cprght for discussing copyright issues
- EWG-market for EurOpen/NALUUG marketing
- EGW-secur for UNIX security discussion
- EWG-i18n for POSIX internationalisation

You register with the list by sending mail to the maintenance email address for the list, which have "-request" after the group name, and all reside at dkuug.dk . For example:

```
mail ewg-i18n-request@dkuug.dk
Subject: subscription
I am a member of <NALUUG> and would like to
join the list.
^D
```

See you in Utrecht

Keld Simonsen

USLE Column

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Gill is Marketing Manager at UNIX Systems Laboratories Europe.

for futher information on this column, please contact Gill on gill@uel.uucp, Telephone +44 81 567 7711.

The European Open Market and Open Systems – much more than a marriage of convenience

The approach of 1992 and the Open European Market is both a challenge and an opportunity for the IT industry. The various European countries have traditionally served as catchment areas for their own proprietary OEM giants. Now the old, comfortable, proprietary way of life is under threat from two directions. The vanishing of internal borders will add considerable impetus to the competitive process between OEMs. While at the same time, the irresistible growth of open systems is already forcing a radical rethink upon all the players in the industry. The European computer industry has recognised that its future prosperity depends upon the adoption of common standards of computing across Europe.

An inevitable consequence of the growth of open systems is increased competition. By definition open systems encourages multi-sourcing. Because it relies on publicly defined standards and interfaces across a range of key areas, from operating system components to communications protocols, open systems speeds up the whole process of bringing new technology to the market. Instead of proprietary companies being in control of the pace of change and managing the introduction of new technology to the market, open systems acts as an enabler of change. The result has been continual improvements in price/performance ratios of hardware.

Already, this has had a dramatic impact on margins. Companies of all descriptions have had to cut down on their overheads. One of the most effective ways of doing this is to cut out unnecessary expense at the product development stage. IT companies now have to make very careful 'build versus buy' decisions. If a particular piece of technology already has a proven track record, or looks promising, then it is frequently going to be more cost effective for one or more players in the market to team up with the provider of that technology rather than to try and compete with it by engineering an alternative solution.

What this means in practice is that while open systems has fuelled competition, it has also provided something of a solution to the pressures on margins. The result is a growth in the number of 'partnering' announcements made by companies who would normally be considered rivals. Some of these announcements are very short term and tactical, others have a more long term dimension to them. One recent example here is the announcement by UNIX System Laboratories (USL) that it had reached an agreement with the Open Software Foundation to make OSF's Distributed Computing Environment technology available for SVR4. Another example is USL's joint venture with Chorus systemes concerning Chorus' Microkernel technology.

The European market needs to be viewed trans-nationally across Europe. This type of market openness can only be achieved through the establishment of publicly agreed standards and published common interfaces. It is highly unlikely that a totally new, open operating platform will arise in the time scales available, and for this reason, the European computer industry is already adopting UNIX SVR4 as the de facto standard operating system.

Proof of this came with the recent announcement that a number of key players in the European computer industry are working as a consortium on a project named Ouverture - backed by the Commission of the European Community to the tune of ECU 14 million - to promote a unified Open Systems policy. The aim of the project is to utilise the best of European and US technology to develop the potential of the UNIX SVR4 operating system in the microkernel arena, swiftly and cost-effectively, by avoiding duplication of research across Europe.

A further aspect of the development of the European computer market is the perceived need for a single platform running from the desktop to the mainframe. Again, at present, only UNIX SVR4.2 is in a position to provide a pan-European open operating system, capable of running across the full spectrum of machines. It is

worth pointing out that some non trivial technical engineering issues needed to be resolved in order to attain this goal.

To be capable of running on PCs as well as on larger boxes, the operating system had to be repackaged with

all the basic functions put into the 'foundation set'. This produced the UNIX SVR4.2 operating system, the same basic module of which runs on everything from the mainframe to the PC. Other modules are available as 'add ons' to address such requirements as multi-user, server connectivity, systems development and so on.
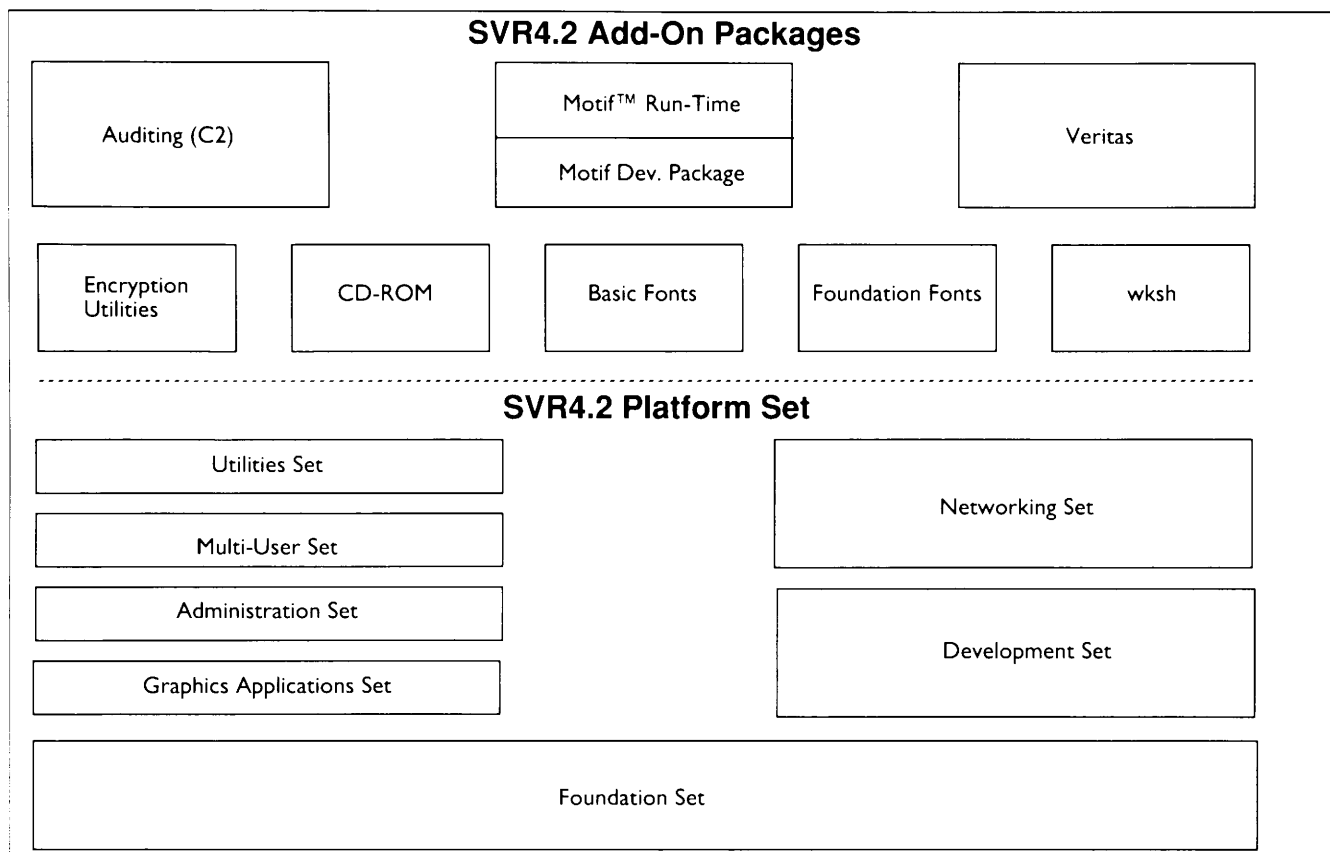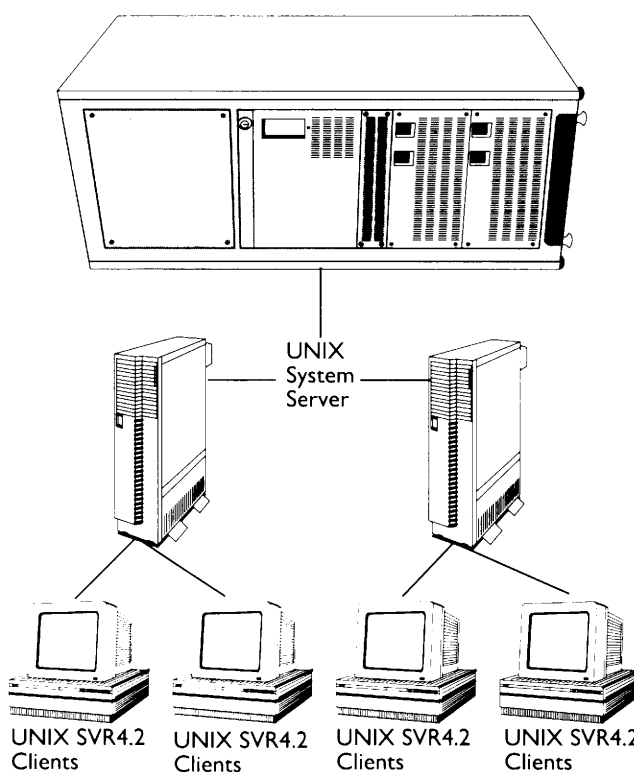
SVR4.2 Add-On Packages

| Auditing (C2) | Motif™ Run-Time | Veritas |
| | Motif Dev. Package | |

| Encryption Utilities | CD-ROM | Basic Fonts | Foundation Fonts | wksh |

SVR4.2 Platform Set

Utilities Set	Networking Set
Multi-User Set	
Administration Set	Development Set
Graphics Applications Set	

| Foundation Set |

Figure 1: SVR4.2 Components

UNIX SVR4.2 is designed to address the current, common requirement across Europe for 'rightsizing'. This is a concept which means giving end users systems which are capable of precisely satisfying the processing requirements placed on them. This means 'downsizing' departmental applications from the corporate mainframe to UNIX boxes and it means giving 'power users' on the desktop the ability to 'upsize' their PCs so that they can run the more demanding applications and access information on an organisation-wide basis.

The current downsizing/rightsizing wave has driven the explosive growth of UNIX system implementations within high-end and mid-range server applications. UNIX provides the functionality required in a commercial environment, coupled with availability on a wide range of hardware platforms that includes every major hardware vendor. Today, information executives, from companies of all sizes, can benefit from the wide variety of hardware choices, client/server application support and connectivity provided by UNIX. All this is available within an environment of application portability and scalability, assuring protection of investment and easy migration paths for the future.

UNIX
System
Server

UNIX SVR4.2
Clients   UNIX SVR4.2
Clients   UNIX SVR4.2
Clients   UNIX SVR4.2
Clients

Expandable and scalable, UNIX SVR4.2's modular architecture is the natural bridge for linking desktops and LANs to mid-range servers and mainframes through a common UNIX SVR4 application and data environment. Imbued with the rich multi-user and multi-tasking heritage of UNIX SVR4, UNIX SVR4.2 answers the modern needs of departmental and inter-departmental computing.

Another key factor in favour of UNIX SVR4.2 is that USL has addressed the issue of volume shipment which is critical to any operating system aiming to support a Europe-wide open systems computing base. Accordingly USL, as was announced some months ago, has formed a joint venture company with Novell, the worlds leading network company. The new company, called Univel, will integrate UNIX SVR4.2 with Novell NetWare. This integrated product will then be distributed and supported through the established Novell reseller channel.

In the past, USL has produced source product and others have gone on to prepare and ship binary versions of the UNIX operating system from that source. With the earlier version, SVR4.0 the gap between the appearance of the source product and a binary product was roughly a year. It is now obvious that in the fast moving world of desktop PC technology, such a time gap is not feasible. A good deal of work has been done to move UNIX SVR4.2 closer to a binary OS product. As a result, the first binary of UNIX SVR4.2 is likely to be available within three months of the launch of UNIX SVR4.2.

The Univel agreement means that USL is able to deploy a two-pronged approach to the channels problem, drawing upon the established strengths of its traditional links with OEMs as well as on Novells proven distribution capability. In other words, in addition to providing the new binary product to Novell to sell through its existing dealer channels. USL in its turn, will continue to be responsible for selling source product to OEMs as well as meeting their requirements for the binary OS provided by Univel.

As a final point, it is worth noting that the two channel approach, through the OEMs and through Novell's dealer channels, is very likely to be mutually reinforcing. As Novell succeeds in selling more and more of its UNIX SVR4.2 binary product across Europe, pressure from end users will grow for the OEMs to ensure that they too, provide UNIX SVR4.2 binary compatible operating systems.

Because UNIX SVR4.2 will come out under a variety of names - each OEM will tend to use their own brand name - USL has established a compliance branding program to guarantee UNIX SVR4.2 compatibility. USL will implement the program, providing the industry with compatibility requirements/specifications for conformance, based on UNIX SVR4.2. All vendors who meet these standards, via verification by USL, will receive the brand. End-users may purchase branded UNIX system products with assurances that the products will work together.

USL, Univel and the OEMs will be running an aggressive campaign aimed at attracting independent software vendors to ensure that UNIX SVR4.2 becomes the standard open systems advanced OS across Europe - and indeed world-wide - in the years to come.
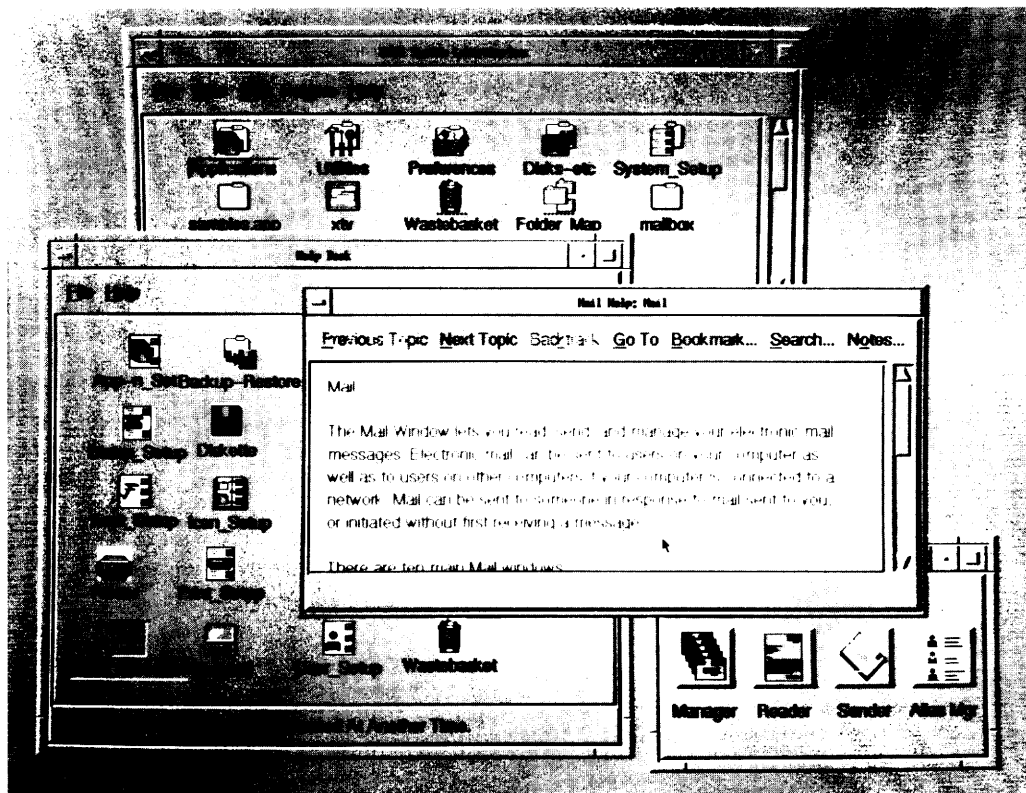
OSF Column

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Mark Laureys joined OSF's European Operations based in Brussels in June 1991. He is responsible for the European Communications and his main task is to provide members of the European press and consultants with information on OSF.

He was previously working in a similar function for a network integrating company called Telindus Networks, part of the Telinfo Group.

For further information on this column, please contact Mark Laureys: telephone +32 2 772 88 88

Europe, on the Brink of a Vast New Market

Today, we stand before perhaps the biggest single opportunity in business history. Advanced technology having brought us firmly into the computer age, information has replaced energy as the world's single most valuable resource. Thus capacity to harness that priceless resource will undoubtedly determine tomorrow's business.

At the same time, the Single European Act is about to open the world largest market. A market of over 320 million people- a market greater in size and potential than even the enormous US market. With the barriers down, the fastest growing segment of this huge market will certainly be information technology. Indeed, demand for data and information exchange, storage and processing is expected to grow with as much as 40% per year. Leaders in this market will by definition have access to the world market.

New Business Challenges

The stakes are high. Removal of national barriers in this new information area will not only open a large untapped market, it will also unleash competition from all over the globe. With powerful companies competing for a share in a much bigger pie. To succeed organisations must have the right experience, technological capability, products and the most important of all highly skilled people. They also must be flexible and forward-looking enough to meet rapidly changing demands of a totally new business environment.

The globalisation of the services industry for instance is bringing with it a far-reaching change in the way of doing business. Borders are disappearing, as much between different production specialities as between countries. Information systems and networks ensure that everyone can communicate world-wide. No one any longer accepts that his data cannot arrive directly onto his business partner or prospect's desk, nor is acceptable that applications can't run remotely on whatever mainframe, workstation or PC on the network.

More interaction and co-operation between larger and smaller companies is another result of the the single European market. The larger the company, the larger its opportunities to invest in future-oriented systems. Small companies are frequently forced to seek salvation in certain restructuring solutions. Larger companies are realising that the key to success lies in anticipating the needs of European customers. This requires an obvious spread of responsibility and a systematic manning of marketing networks. Smaller companies who are able to form useful alliances can gain major opportunities this way. Those alliances and co-operative business networks all over Europe will surely benefit from an open systems environment.

Open Systems for an Open Market

The IT environment is not much different from the socio-economic environment as described above. As diversified and heterogeneous it is looking for more openness and interoperability. Millions of different PC's and workstations have entered most companies through the back door. With hardly a thought to co-ordination. This technological tidal wave now has to be correctly channelled. How do we avoid being swept away under mountains of incoherent data? How can these intelligent machines be usefully applied to the company's business objectives? Will everybody have to throw away their proprietary systems in order to be open? Every European IT user and business strategist is faced with major choices which will bind his company for the years to come.

The Open Software foundation believes that the cornerstones for the solution to those business and technological challenges are openness and more especially interoperability.

It should be however understood that openness is not a function of which operating system is used. An open environment is one that employs a standard set of interfaces for programming, for communications, for networking, for system management, and for user look and feel. The open systems environment must supply common ground for incompatible hardware, operating systems, software, and the people using them to transparently interact. It must supply supervisory services to all the resources throughout a computer network.

Standards are an important part of the migration path to open systems. With the unification of the EC market and the emergence end 1992 of a new economic territory, there will be an acceleration of the standardisation process. One will of course need more than ever to follow industry (de facto) standards or de jure standards, when they exist, in order to tie up the existing heterogeneous systems. But as IDC reported before in a review of the Unix Software Marketplace in Western Europe "The standardisation process takes time (...) and is far from complete". It is OSFs charter to help the information processing industry specify and standardise the interface definitions of an open systems environment, as well as to provide reference implementations of software adhering to those specifications.

OSF proved being a front runner in this process by launching successfully enabling technologies which are now accepted by the industry at large and will serve as reference platforms for the future standards. The graphical user interface MOTIF is one example and DCE (Distributed Computing Environment) will follow now that the major players in the industry have announced their plans to integrate DCE in their technology architecture or in their product development plans.

Interoperability - The Next Step

To the previously asked question "do we have to throw away our proprietary systems in order to be open?" OSF's answer is NO. Complexity is more than ever a reality in the corporate world. So is the need to preserve investments, in hardware and software, while enabling corporations to add technologies they need without jeopardising what they currently have.

Interoperability among diverse systems is the key for users to migrate smoothly from a proprietary to an open computing environment and to provide them with the freedom to choose the appropriate computing solution for the job at hand. To do so, they need to mix and match hardware and software from various vendors, easily access and protect the data stored in their networks, and apply a common management scheme to an array of diverse systems. OSF's Distributed Computing Environment (DCE) and Distributed Management Environment (DME) technologies address this interoperability need.

Drawing on the client/server model of computing, the Distributed Computing Environment (DCE) from the Open Software Foundation (OSF) allows companies to transcend the limitations that geography traditionally has imposed on their business. The DCE lets information flow from wherever it is stored in a network to wherever it is needed. As a result, users can take advantage of applications and data scattered throughout the network. Accessing files and information from a remote branch office becomes as easy as retrieving it from across the room. An early adopter of the technology has been the European Commission. The EC has announced early last year that it plans to use DCE for a new generation of distributed applications as part of their multivendor computing strategy that supports about 10,000 end users.

The OSF DME, currently under development by OSF, draws on services provided in the DCE as well as object-oriented technology to manage stand-alone systems from multiple vendors as well as the growing number of distributed systems in use. The goal of the DME is to simplify the management of heterogeneous computing and network environments.

Conclusion

Interoperability is the answer to managing the complexity of today's and tomorrow's computing systems in Europe. The benefits of interoperability are far-reaching, and include not only operating system technology, but other enabling technologies, such as those discussed above.

We at OSF believe the open systems horizon extends far beyond operating systems. OSF enabling technologies provide a base which protects user investment in hardware, software, training and applications while allowing innovation to flourish, resulting in products which will enrich and bring diversity to the industry.

The effects of interoperability technologies on computer users will be profound. Users will be freed to select hardware, operating systems and software applications that best meet their current needs, and anticipate their future needs.

OSF NEWS

OSF Delivers OSF/1 Release 1.1

Recent Development Boosts Performance, Internationalization, and Robustness Brussels, June 25th : The Open Software Foundation today announced the general availability of Release 1.1 of the OSF/1 Operating System. This is the second major release of the operating system, which was first introduced in October of 1990.

"This release of OSF/1 demonstrates OSF's clear commitment to the ongoing development and adoption of the OSF/1 operating system in the marketplace," said David Tory, OSF's CEO. "OSF/1 Release 1.1 provides a

robust and compatible platform that end users are demanding for their open systems environments."

OSF/1 Release 1.1 includes:

■ Enhanced internationalization - Enables application developers to reach world-wide markets without rewriting their application code to support different languages. Extended UNIX Codes (EUC) provide support for ideographic languages such as Korean, Chinese and Japanese. Additional work includes conformance to the X/Open XPG4 draft specification for wide-character interfaces.

■ Scalability enhancements - Extend the reach of OSF/1 systems to PC-class computers. OSF/1 Release 1.1 runs on systems with as little as 4MB of memory, taking advantage of the OSF/1 dynamic configuration capabilities to load and unload major subsystems, such as NFS, TCP/IP, or a System V file system, at runtime.

■ SVID 3 compatibility - Ensures that applications written for System V Release 4 will be portable to OSF/1. Release 1.1 provides SVID 3 compatible STREAMS implementation. (SVID 3 is the specification for System V Release 4.)

■ Performance enhancements - Boost responsiveness of the system, especially in the areas of virtual memory, NFS, and the loader.

■ Standards compliance - Ensures that OSF/1 systems evolve concurrently with relevant industry, national, and international standards. OSF/1 is fully compliant with POSIX 1003.1 - 1990, ANSI C, and XPG3, among others. Release 1.1 also includes work based on POSIX drafts of 1003.2 for commands and utilities, 1003.4a for Pthreads and 1003.6 for security.

This release of OSF/1 continues to provide the symmetric multiprocessing capability and security features required by the commercial processing market.

Parallel development continues in the OSF Research Institute on the OSF/1 Microkernel technology, now available in snapshot form to OSF/1 licensees.

The Release 1.1 tape includes three reference implementations for the following architectures: Intel 302 (80386 based), Digital DECstation 3100 (MIPS based); and the Encore Multimax (National Semiconductor based).

OSF/1 Release 1.1 is priced at $85,000 for a source license with full distribution rights; $60,000 for a source license only. Existing source licensees may upgrade from Release 1.0 to Release 1.1 for $25,000. Licensees who hold full support contracts will receive the upgrade without charge as part of their support services. University site licenses are available for $5,000.

Binary royalty fees remain unchanged at $65 per copy, with volume discounts available. The price to upgrade non-distribution source licenses to full redistribution rights remains unchanged at $35,000. For further information, contact OSF Direct at +1-617-621-8700.

Open Software Foundation Unveils DME Roll out Plan

Brussels, 25th June : The Open Software Foundation made public the development and release schedule for its Distributed Management Environment (DME). OSF also announced that the first Snapshot release of the DME technology is now available to OSF members. Under OSF's Snapshot program, members are offered early access to source code throughout the development cycle.

"The end user community has been demanding a solution to multivendor distributed management," said Garry Baer, a technology manager for DME. "Responding to this market need, OSF has put in place an aggressive, phased roll out plan designed to make DME components available as rapidly as possible to facilitate broad early adoption."

DME provides an effective solution for systems administrators, who need efficient and reliable management services to keep their distributed computing environments operating smoothly. Application developers will benefit form the rich set of tools and services the DME framework provides for writing management applications. End users will benefit from knowing they can work effectively and efficiently, free from concern about how the system is running.

DME will roll out in a modular five-step process. The Distributed Services Release, targeted for general availability in the first half of 1993, will provide key distributed management services to the OSF Distributed Computing Environment (DCE) technology.

In the second half of 1993, the DME Framework Release will provide the integrated DME framework, development tools, and selected framework applications.

The OSF integration model is a collaborative effort between OSF and its technology suppliers. Sub-integration teams for discrete components are made up of technology suppliers and OSF. The final integration and testing will be done at OSF headquarters in Cambridge, USA.

Based on advanced object-oriented technology, DME is the first vendor-neutral platform for managing networks and distributed systems from different vendors. It is compatible with existing distributed systems while providing a means of migrating to newer technologies. In this way, DME ensures that organisations can capitalise on their investments in hardware and software.

Micro-kernels and Other Kernel Architectures

Peter S. Langston

E-mail psl@bellcore.com

Seattle, WA, April 27-28, 1992

The first Usenix "Workshop on Micro-kernels and Other Kernel Architectures" was held on twenty-seventh and twenty-eighth April in sylvan Seattle, Washington (a.k.a. the "Emerald City" for the same reason that it is a.k.a. the "Rain City"). With three-hundred and thirty-four attendees, more than three times the anticipated number, this was not so much a workshop as an SRO conference - literally every seat in the huge meeting room was taken and some people even had to be turned away.

The rest of the title of this workshop/conference also managed to cause controversy. While some thought that the title should logically have been reduced to "Workshop on Kernel Architectures," others thought that the workshop was probably aimed at comparing and contrasting existing micro-kernels and their macro-kernel counterparts and therefore should have been called "Workshop on Micro-kernels vs. Other Kernel Architectures." Still others questioned the use of the term "micro-kernel" to describe systems that require several megabytes of memory to operate a light switch ("Does this mean that MVS was really an early micro-kernel?"). In any case, the persistent inclusion of phrases such as "and other kernels" betrayed the catholic intentions of the organisers.

Monday, April 27

As advertised, the first day's sessions dealt with introductory talks on currently important micro-kernels "and other kernels." After the opening remarks from Program Chair Lori Grob, five one-hour overview talks were presented.

■ Robbert van Renesse (Vrije Universiteit/Cornell University) presented a "Short Overview of Amoeba" which was an update on a talk that has been given a few times before. His talk featured some interesting new slides including one that was the basis for Figure I shown here (with the addition of an NT column and minor editing by me).

■ Rich Draves (Carnegie Mellon University) gave a talk on "Microkernel Operating System Architecture and Mach" that was characterized by one of the other paper presenters as "the most realistic Mach talk ever." That evaluation may have been influenced by

a section of the talk dealing with difficult decisions and things that they might do differently next time.

■ Dave Presotto (AT&T Bell Laboratories) described "Plan 9, A Distributed System." Aside from describing the ideas and implementation of Plan 9 (simplification and minimalism expressed as taking a few good ideas and using them to extremes), Dave also described a luxurious back-up system and provided some aphorisms: "file systems are cool," "name spaces are cool," and so on.

■ Marc Rozier (Chorus Systèmes) gave an "Overview of the Chorus Distributed Operating System" that placed it both historically and technically. Much of Chorus's terminology predates the current crop of buzzwords, making the associated paper refreshingly free of them. But not to be left behind, Marc's talk joined the rush into the mid-90's with a "nano-kernel" (Real-time Executive). Marc also described "COOL" (Chorus Object Oriented Layer) but missed the chance to aphorize that "Chorus's object oriented layers are cool."

■ David Cutler (Microsoft Corporation) spoke on "Microsoft Windows NT" giving a broad overview ranging from Microsoft's systems strategy and market perspective through architectural issues to time and space measurements. David made the observation that NT is hardly a microkernel and must be the "other kernel architecture" mentioned in the workshop title.

The next session, chaired by Dag Johansen (University of Tromsø), was on "New Architectures" and consisted of two papers.

■ Jonathan Walpole (Oregon Graduate Institute of Science and Technology) described "Modularity and Interfaces in Micro-kernel Design and Implementation: A Case Study of Chorus on the HP-PA Risc." This port of Chorus to the HP PA-RISC workstation took a year to do, uncovered common but inefficient operating system interface architectural assumptions, and illustrated the tradeoff between micro-kernel modularity and performance. Even better, the first sentence of the paper's abstract actually answers one of the questions raised by the workshop's statement of purpose.

■ Toshio Okamoto presented a paper entitled "A Micro Kernel Architecture for Next Generation Processors" outlining a design for an OS kernel that takes advantage of the large address space of new processors. Three design features are postulated: single virtual storage (no context switch address remapping), one-level storage (files, libraries, etc. are all parts of the single address space), and fine-grain memory protection (PTEs and two kinds of ACLs implemented by a fancy MMU). Any paper that shows the subroutine call as a new way to do message-passing gets my vote.

Figure 1: Comparison of micro-kernels

Centralized processor pool	Symmetric	Centralized processor pool	Symmetric	Symmetric
Object-based	? (whatever)	File-based	Object-based	Object-based
RPC multicast	Message + RPC	Streams + file system RPCs	Message + RPC + unreliable multicast	LPC + RPC
Capabilities + directory service	Port rights + directory service	File name space (directories)	Capabilities	Unified name space per machine
Capabilities	Port rights communication based	Owner/group/other (owner can be a set of users)	Capabilities	All objects protected with ACLs
Yes, kernel-scheduled	Yes	No	Yes	Yes, kernel-scheduled
Slow source emulation	Yes	Almost exactly Unix with library level Posix	Yes	Posix support
Excellent support	OK	Not really	OK	Yes, RPC based
Yes	Excellent	Great UMA (SMP) support	Yes	Excellent
Segments	Paging	Paging	Paging	Paging
Replicated services	No explicit support	Great backups	Dynamic reconfiguration	Mirroring, striping, duplexing, & others

The final session of the day was the Micro-kernels Panel Session moderated [sic] by Peter Honeyman (University of Michigan). The panelists were: Dave Presotto, David Cutler, Rich Draves, Jim Lipkis (Chorus Systèmes), and Robbert van Renesse. It is not unusual for the moderator of such a panel discussion to have to calm down the panelists and act as peacemaker; that did not happen. What did happen? Well, here's what I was able to write down. I started out indicating all the places where there was general laughter or applause, but there were so many that I had to give it up. "Floor" is used to indicate a question or comment from "the floor." For the panel members I have used initials (so only really smart people will know who said what).

P.H.: It's all lies! It's all the same bloat as a Unix kernel - so why is it "micro"?

R.D.: You can throw away the Unix part of the bloat...
P.H.: But then it's not useful!
J.L.: If you want to make money it will have to have Unix.
D.C.: or DOS.

... [discussion of some Plan 9 port that was done in 7 days - mostly the time it took Ken Thompson to port the C compiler.]

D.C.: Have you guys got any more of those porting guys:? I'd like a couple.
P.H.: I don't think you can afford them, Dave.
[D.P. talks a lot and teases Chorus for their diagrams]
P.H.: Dave, what does NT stand for, anyway? It certainly couldn't be "New Technology"...
D.C.: If you've ever seen the inside of DOS you'd

see why NT is New Technology.

P.H.:   I'd like to be the first to welcome Microsoft into the 1970's. ...

P.H.:   Everyone but Plan 9 claims to be a virtual "porting machine." ... [P.H. asks a confusing question of J.L. and then tries again and makes it coherent and gets a careful, coherent, and unamusing answer.

This is followed by an unanswered, but much more amusing question.]

...[D.P. breates R.D. for Mach trying to be all things for all people and wanting to make a platform that then requires everything else (e.g. Unix emulation) to be added on.]

J.L.:   The world outside this room doesn't care about minimality and cleanliness...

D.P.:   Now you're getting to the important point - none of this really matters!

... [An audience member asks a question about whether any of the so-called micro-kernels can run in 8K of memory]

R.R.:   Amoeba will run on an 8K machine - with the right ifdefs.

[J.L. claims that minimality was investigated as a goal (for Chorus) and found "not to be a win" so all the things that were removed were put back in.]

J.L.:   Minimality itself is not much of a goal.

Floor: What do these systems do when faced with data rates of a terabit a second?

D.P.:   Does "choke and die" mean anything? [general agreement] We're still limited by our interfaces to about 10 megabytes per second.

Floor: Okay; Plan 9. How do you know what something's called if everything can have its own name space?

D.P.:   ...by convention... [he gets onto the subject of catching all filesystem references]... The ability to do that, the ability to circumcise the world, ... er, ... to circumscribe the world is immensely powerful... [there follows a fairly long discussion over whether Plan 9's lack of structure is a **G**ood **T**hing - D.P.'s apparent willingness to admit the possibility of being wrong creating something of a feeding frenzy among the other panelists.]

P.H.:   Well, that's it. Goodbye.

The reception that followed was distinguished only by an unusual surfeit of blue sky outside the picture windows and an unusual deficit of beer from the excellent local micro-breweries. The appearance of six bottles of Red Hook early in the night (hotel leftovers) only served to whet appetites that could not be satisfied in the hotel...

Tuesday, April 28

The first session on the second day was called "New Systems" and was chaired by Robbert van Renesse. Four papers were presented.

■ Charles Landau (MACS Lab, Inc.) talked about "The KeyKOS® Nanokernel Architecture." Development of this nanokernel system began in 1975 and the system was in production use by 1983. It can run in 100 kilobytes of memory and a subset of MVS has been ported to the KeyKOS platform. Designed to favour reliability and security over performance, the system requires extraordinary measures to set capabilities at initial startup, but once set they are "persistent" and can be retracted only by prearrangement. This makes a development problem when a test system gets "weird;" even pulling the plug doesn't fix it because it is "persistently weird."

■ Dan Hildebrand (Quantum Software Systems) gave "An Architectural Overview of QNX." This new system has only existed since 1982 and was (according to Intel Corp.) the first multiprocessing O.S. on the PC. The latest version is Posix compliant and only requires 6.8K bytes of memory for the micro-kernel, but would require nearer 100K for a minimal, a.k.a. "light-switch," O.S., (big enough to be a nano-kernel, I guess). Audience questions concerned clock synchronization on the LAN and plans to port to a RISC machine (no).

■ E. Douglas Jensen (Digital Equipment Corporation) spoke on "An Architectural Overview Of The Alpha Real-Time Distributed Kernel." This amusing talk about the distributed thread, real-time, OS kernel joint project involving Concurrent Computer Corp., D. E. C., and the Open Software Foundation contained numerous pithy quotes - "Real Fast" is not "Real Time" - "The security guys are seriously anal retentive" - "There's nothing micro about Alpha." Strangely enough, in support of the last statement he mentioned that the source code was 20,000 lines of C, the same number claimed for the KeyKOS nanokernel.

■ W. E. Kuhnhauser (German National Research Center for Computer Science) talked about "Performance of the BirliX Operating System." While the paper characterizes BirliX as "an operating system for distributed, secure, and fault-tolerant applications" the speaker pointed out that it may be viewed as a "persistent object management system" and not a micro-kernel in any case. On the other hand, this is probably the newest of the new systems that were presented in this session.

During the break before the next session, the team that had spent the previous evening investigating Micro-breweries and Other Brewery Architectures made an appearance to give a report (the principal investigator's colouration could only be explained as a tribute to the Emerald City). Following the break, a paper session entitled "Lessons Learned," chaired by Edward Lazowska (University of Washington), presented three papers.

■ Jun Nakajima (Fujitsu Laboratories Ltd.) described "Multimedia/Realtime Extensions for Mach 3.0" making some interesting comparisons between Mach 2.5 and Mach 3.0 in the process. He divided multimedia devices into two types - response-time-

sensitive (event-driven) and response-time-insensitive (deadline-driven) and showed how extensions to include "realtime threads" and a "temporal paging system" handle them.

■ Henry Massalin (Columbia University) spoke about "Reimplementing the Synthesis Kernel on the NeWS Workstation." Synthesis breaks most of the rules: it is written entirely in macro assembler, the kernel includes self-modifying code, it is blindingly fast (as are the programs that run on it), it is small (a minimal kernel runs in 16K RAM and 16K ROM), and is not called a micro-, nano-, pico-, or femto-kernel. Henry played a recording of some music produced by software synthesis. He mentioned that a keyboard note generator program takes 720 micro-seconds to (1) sense a key press, (2) create a thread, (3) attach the thread to the audio output, (4) start executing the thread, and (5) produce the beginning of the sound output. Henry also described some clever solutions to cache concurrency problems encountered by machines executing self-modifying code. Quincy and his daughter Emily appeared briefly and said "qua" encouragingly to the audience.

■ William Davenport (Digital Equipment Corporation) presented "A Model and Prototype of VMS Using the Mach 3.0 Kernel." Modeling VMS took 9 months; prototyping the VMS model took another 3 months. A plea for a native mode Mach debugger was made (with agreement from the audience). After implementing 46 of the 250 VMS system services, several VMS utilities were found to be runnable. Conclusions were drawn: micro-kernel technology is cool and multi-server technology is cool, but performance is probably a casualty.

Lunch was uneventful except that we got to see Historic Pike Place Market, ate a lot of Mexican food, and drank fluorescent Mexican sodas (to the horror of the aforementioned micro-brewery test team captain).

Program chair Lori Grob was also session chair for the following three paper sessions, "Experience and Observations I".

■ Brian Bershad (Carnegie Mellon University) decried "The Increasing Irrelevance of IPC Performance for Microkernel-Based Operating Systems" while new Seattle resident Rick Rashid turned the slides. Four points were advanced: IPC has gotten faster, faster than other stuff; caches, not address spaces, determine performance; All data does [sic] not need to go through the kernel; all services do not need a hardware firewall. The question period was initiated with the reminder that an unwritten rule disallows the slide turner from asking questions.

■ Jochen Liedtke (German National Research Center) presented a paper on "Fast Thread Management and Communication Without Continuations" that describes the operating system L3, argues for the relevance of IPC and concludes that (1) IPC can be implemented realy fast; (2) continuations will not support this job; and (3) availability of fast IPC changes programming behaviour. Confused questions

ensued.

■ Jim Hamrick (Unisys Corporation) discussed "Experience with SVR4 Over Chorus" and stressed that the project was one of very few involving commercial product development with micro-kernels rather than academic research on them. Twenty-two people spent eighteen months bringing the project to completion. The initial requirements are met and the system is stable.

The final break of the conference passed with no noteworthy occurrences. The chair for the last session "Experience and Observations II" was Jim Lipkis.

■ Randy Dean (Carnegie Mellon University) pointed out that his talk would be different from the paper "Data Movement in Kernelized Systems" in that the paper strives to describe Chorus and Mach side by side while the talk just focuses on their similarities, which include: VM central caching, an external mapper, fast & reliable IPC, and a trap redirection mechanism. He concludes that kernelized systems are here [but are they cool?] and good file system performance is possible.

■ Marc Shapiro (INRIA) gave a design report entitled "Distributed Abstractions, Lightweight References" in which a library of useful abstractions structured as fragmented objects and protocols to support lightweight, robust, uniform, garbage collected, distributed references are proposed as amendments to current operating systems designs in place of the more "heavyweight" ports, pipes, and sockets.

■ Robbert van Renesse presented "Reliable Multicast between Microkernels," describing a re-implementation of the ISIS system designed specifically to take advantage of microkernel technology and fill in some gaps in current microkernel support (e.g. cross-network communication and failure detection). One of the goals is to make the ISIS system "FTPable" and examples dealt with the netnews-like "ISIS news groups."

■ Michael Stumm (University of Toronto) gave the final paper, "Designing a Scalable Operating System for Shared Memory Multiprocessors." This paper proposes a structuring technique based on clustering to solve problems of scalability in multiprocessor operating system design.

As the second day came to a close and questionnaires were handed out, attendees had a chance to look back over the two days and evaluate the workshop design. The initial overview sessions established a basis of reference for the later discussion (and disabused the attendees of any notion that the term "microkernel" implies something about size). The following papers were both interesting and well-presented and the panel session was ... well, interestingly presented. This timely workshop dealt with a topic that, as the attendance attests, is a real "hot button." The organisers (and the program chair, Lori Grob, in particular) deserve kudos for a job well done.

UNIX & OPEN SYSTEMS 92

A
Datapro International
Conference

Architectures and Networks

1 – 2 October 1992
Brussels Hilton
Belgium

Datapro International's 1992 UNIX Conference will look beyond Open Systems to the architectures and networks that form the basis of all systems, not just Open ones. A highly practical event, the conference will examine the technologies and issues that affect Open Systems, distributed computing, and the overall computing environment of the 1990s.

Key issues such as the integration of Open Systems with proprietary systems will be discussed throughout the event and state of the art applications such as OLTP will be featured.

The emphasis of all the presentations will be on practicality – senior managers from leading user organisations will detail their experiences of using Open Systems. Vendors will put forward their interpretations of today's environments and present solutions to user problems. Featuring in the conference will be presentations by the two leading forces in UNIX and Open Systems today, UNIX International and the Open Software Foundation (OSF).

Who should attend

This conference will appeal to:

◆ Senior IT managers from user organisations currently seeking to implement an Open Systems strategy, or currently using Open Systems;

◆ Product or marketing managers from vendor organisations who are keen to understand their clients' (and prospects) issues and concerns;

◆ Consultants, analysts, and other individuals interested in gaining a greater understanding about the technology behind Open Systems and into the practical and strategic side of using Open Systems.

Day 1

08.30 Registration & Coffee

09.15 **Keynote 1 – Operating Systems in the 1990s**
Michel Gien, Managing Director, Chorus Systèmes SA, France

10.45 Coffee

Architectures – User Forum

11.00 John Winkle, Information Technology Director, Yorkshire Electricity, UK

11.30 Gérard Lledo, Vice Director of Information Technology CEA-Commisariat à l'Energie Atomique, France

12.00 Steve Eaves, Head of Computer Services, Performing Right Society, UK

12.30 Lunch

Architectures – Vendor Forum

14.00 **Downsizing, Rightsizing and Client Server Architectures**
Gert Haas, Marketing Director, Sun Microsystems Germany and Central Europe, Germany

14.40 **The Future Trends in Client Server Computing**
Gilbert Vidal, Marketing Director, Sybase Europe, France

15.20 **The Atlas Architecture**
Peter Wharton, UNIX International, Belgium

16.00 Coffee

16.15 **Keynote 2 – Commitment to Open Systems**
Mike W. Johnson, Head of Information Technology, Unilever, UK

16.45 Round Table Discussion

18.00 Conclusion of Day 1

18.30 Cocktail Reception

Day 2

08.15 Coffee

08.45 **Keynote 3 – The Global Vision of the 1990s**
Doctor Philip M. Neches, Senior Executive VP and Chief Scientist, NCR Corp., U.S.A.

10.15 Coffee

Networks – User Forum

10.30 Rul Bana Costa, Information Systems Director, Lisbon Stock Exchange, Portugal

11.00 Pierre Breuer, MIS Director, Belgium Television, Belgium

11.30 Harald Wolfgang Bachleitner, Director of Administration, City of Munich, Germany

12.00 Lunch

Networks – Vendor Forum

13.30 **Corporate Networks: Strategy for the 1990s**
Harald Schmid-Heizer, Network Expert, Siemens-Nixdorf, Germany

14.10 **Managing a Distributed Heterogenous Environment**
Dick Emery, Marketing Manager, ICL, UK

14.50 **DCE & Communication in an Open Architecture**
Colin Scaife, Open Software Foundation, Belgium

15.30 Coffee

15.45 **Keynote 4 – Commitment to Open Systems**
Colin Bailey, Head of Open Standards and Inter Company Systems, Shell, Holland

16.15 Round Table Discussion

17.00 Conclusion of Conference

Speakers and titles subject to change without notice.

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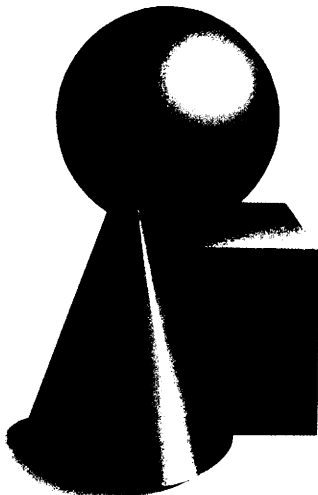
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Book Reviews

This book describes how to manage and set up a network filesystem installation. It is well set out and starts with a short chapter describing Network Fundamentals. This includes a description of the ISO seven layer model (yet again!) and what each layer does. This part is only 14 pages so it will not be of great use to a beginner to networking. It is, however, a useful place to explain what short forms it intends to use for things which may have numerous names, for example 'network stack' for the ISO seven layer model.

The next chapters are on NFS and NIS and describe what they are and what facilities they provide. I knew what NIS was but didn't know all the details about what program did what. These chapters explain well the functions of each program. The preface also has the reference to NIS formerly being called "Yellow Pages" and how it had to be changed to avoid conflict with registered trademarks :-).

The book then goes into more detail about NFS design and operation, describing Vnodes, the NFS protocol, the NFS daemons, Caching and File Locking. There is a chapter about diskless workstations and how to set them up. There is the obligatory chapter in networking books on Network Security with a reference to a specific security book for general UNIX security. It explains how to set up Secure RPC and Secure NFS. I am not sure if these features are available on all NFS systems but I want to try them out.

The later chapters in the book will be of more use to the administrator once the initial NFS and NIS systems have been set up. These contain information on diagnostic and administrative tools and how to debug an NFS system, something much vendor documentation glosses over without much help (RTFM). There is also a chapter about performance analysis and tuning your NFS system to your requirements. The automounter is described in a chapter of its own. This warns of the side effects of using this and which programs it may cause to function incorrectly. For completeness there is a chapter describing PC/NFS which brings together some of the information which could be found in vendors manuals but would be somewhat scattered. There is even a chapter on centralising mail services which contains examples which look like they may well be taken from a real system.

The appendices gives some useful information which is related but not essential to the understanding of NFS and NIS. These contain a description of transmission line theory with relevance to Ethernet, a short description of IP packet routing, an NFS problem diagnosis section and a section on NFS benchmarks.

All in all this is a good book. It should be noted that it is not for a beginner to UNIX or to networking. It itself says this in the Preface, recommending it be used by system administrators and network managers who are installing or planning new NFS and NIS networks or debugging or tuning existing ones. This is precisely who should read this book. In conjunction with the vendor specific documentation it should enable setting up an NFS network to be relatively pain-free.

One fault with the book is that it only refers to the SunOs 4.1 and later versions of NFS and NIS. I assume most versions of NFS will be pretty similar so it shouldn't be a problem. It would have helped to see a section which at least highlighted where any differences were likely to be.

This book has a drawing of a Jersey cow on its cover. The reason for this, so the colophon tells us, is that "UNIX and its attendant programs can be unruly beasts" and that "Nutshell Handbooks help you tame them". Some interesting information about the Jersey breed follows this and a little about the typefaces used in the book (uninspiring), and the software (weird) and the hardware (low quality) used to produce it. The presence of this sort of stuff usually indicates a better than average book. And it is. But no better than better than average.

The book stumbles along, finding its feet and even managing to fly quite often, but it just as surely crashes again. The biggest problem is that the author keeps giving examples of how *not* to program in C. One of the worst pedagogical devices that an author could possibly employ. He also clutters the text with what he calls "questions". These are bits of buggy program in which the reader is supposed to find the faults. Helpful hints are sometimes given such as "use lint" or "look at the preprocessor output" - perfect for the reader on the move. There are also far too many examples, something that you may find hard to believe. They get in the way of the flow of the text and make comprehension difficulty.

However, the coverage of C is excellent (even though the author does perpetrate the old for/while statement equivalence canard). In particular the illustrations

really do illustrate the text rather than being ornamental and the explanation of pointers is clear and simple because of this. Coverage of programming techniques is also good and the advice given sensible. All your favourite hints, tips and aphorisms are here. The author discusses style religions, but, sadly, he plumps for the wrong one and then proceeds to be inconsistent in its application! He does write readable English though.

I think that this is really two books - one on C and the other on C programming. In this combination the two sit uneasily together and the reader has to work harder than necessary. In retrospect it may even be *three* books - the third being a workbook of examples complementing the other two. Nevertheless Practical C Programming is miles better than the majority of books in this area and I wouldn't actively discourage someone from buying it. The price? As usual, a little on the high side, but it's not too bad for what you get.

In a nutshell : close but no cigar.

UNIX system V commands: programmer's rapid reference,
Baird Peterson, Van Nostrand Reinhold, 1992
ISBN 0-442-00998-4.
Price £22.00, Soft Back, 137 pages

UNIX system V system calls: programmer's rapid reference,
Baird Peterson, Van Nostrand Reinhold, 1992
ISBN 0-442-00909-7.
Price £22.00, Soft Back, 257 pages

XENIX commands and DOS cross development services:
programmer's rapid reference,
Baird Peterson, Van Nostrand Reinhold, 1992
ISBN 0-442-00540-7.
Price £22.00, Soft Back, 181 pages

Reviewed by Loek Schoenmaker of Vrije Universiteit, Amsterdam

E-mail loek@cs.vu.nl

The first book describes all UNIX System V Release 4 commands "for general software development," the second book describes all UNIX System V Release 4 system calls "for general software development." The third book describes all commands required for normal XENIX software development and porting UNIX programs to XENIX or vice versa and some DOS-calls. So far the contents. So far the differences. The books are very much alike in almost everything else.

The layout is the same throughout: all commands are presented like man(1) pages after a short introduction containing an explanation of the notation and a command classification.

The books is meant both for experienced UNIX programmers and newcomers to UNIX programmers. I doubt if either of them really needs this book: man pages are available on most systems for easy reference and there must be others books introducing UNIX programming. Furthermore, the preface says that all commands for general software development are

described. What I really miss is information about the commands that are not described: Is Peterson's view of 'general software development' the same as mine?

The layout is far from perfect. The table of contents is illegible, tables are not always aligned, the text is difficult to read, especially as a Constant Width font has been chosen for commands, options etc. Because the point size of the text is 10, it is not pleasant to read. As a consequence, some lines are overflowing. This causes certain identifiers to be broken over 2 lines (or even over 2 pages).

I spotted quite a lot of typos. Among them misspelling of command options. e.g. first book, command cc: first the options -X{a|c|t} are introduced as the various options to specify ANSI conformance. But then the options -Xt, -Xa and -Xt are explained. Names of mode bits (second book, function semget: IPC_VREAT instead of IPC_CREAT) are misspelled, or even worse errors are made. E.g. second book, stat function: the mentioned stat, fstat and lstat are not left-aligned and in two of the three prototypes a comma separating the arguments is missing.

I wonder who should buy it and if anyone's going to buy it at all: my advice is not to buy it

Zen and the Art of the Internet: A Beginner's Guide to the Internet
Brendan Kehoe

Reviewed by (C) Billy Barron

E-mail billy@vaxb.acs.unt.edu

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Zen and the Art of the Internet is a new guide to the Internet that was written by Brendan Kehoe of Widener University. His goal was to introduce the reader to the resources that are available on the Internet. At the same time, Kehoe tried to avoid system specific information. It should be noted that parts of Zen and the Art of the Internet were derived from other works.

This 'book' is currently published via ftp (see availability in the last paragraph).

Zen and the Art of the Internet starts off with a chapter on network basics. This chapter is a good introduction to the Internet, but it is not a general guide to networking. Rather, it is Internet and TCP/IP specific. If this chapter can be faulted for anything, it is that it oversimplifies some of the material. On the other hand, it definitely should not scare off the novice user.

The e-mail and FTP chapters are very good, although they do get technical at times. The e-mail chapter could be improved by the addition of a section on etiquette similar to the excellent one in the FTP chapter.

The Telnet chapter is packed with examples of Telnet-accessible services, and it explains how to find out

about more services. I was rather disappointed by the omission of any information on tn3270. A description of how Telnet is different on IBM mainframes is also needed. These omissions may lead to some confusion on the part of IBM mainframe users.

Kehoe describes other tools that are available on the Internet. These descriptions are well-rounded and useful, but Kehoe has just covered the most common tools.

One of the most outstanding sections of Zen and the Art of the Internet is called "Things You'll Hear About." In a lot of ways, this chapter is a FAQ (Frequently Asked Questions) to the Internet, and it will answer many questions of the new network user. At the same time, it introduces the novice user to the folklore of the Internet without being intimidating.

Zen and the Art of the Internet also has useful sections that contain information about commercial services, other networks, how to retrieve files, and how to find out more about the Internet. The USENET chapter does a great job of covering the most common misconceptions people have about that network. The document includes a helpful glossary.

The conclusion states "this guide is far from complete--the Internet changes on a daily (if not hourly) basis." Then Kehoe goes on to ask for suggestions. For Zen and the Art of the Internet to be useful in the long run, it will need to be updated on a fairly regular basis. From what I can tell, it sounds like Kehoe is planning on doing this. I'm sending in my suggestions, and I highly recommend you do the same.

Overall, I was very impressed with this document. In fact, the same day that I downloaded it I had our receptionist make copies and distribute them to the whole Academic Computing Support Staff. In a couple of days, I am going to do the same with our library. My girlfriend's university just got on the Internet and I'm giving her two sources of information to start with: the first is HYTELNET and the second is going to be Zen and the Art of the Internet. It has a few rough spots, but I'm sure that Kehoe will fix them. The biggest problem is that it paints too rosy a picture of the Internet, but this kind of document is intended to get users interested in the network not to critique it.

I try to stay ahead of most Internet users in terms of my knowledge of what's available and how to access it. Well, I learned a couple of things while reading Zen and the Art of the Internet, so it is not just for novices. At the same time, it is easily understandable by novices. My message to Brendan Kehoe is: Keep up the good work!

Access Instructions

The file is available on host ftp.cs.widener.edu (147.31.254.132) in the directory pub/zen and on ftp.uu.net in (137.39.1.9) in the directory /inet/doc. Although the author reports that he has signed an agreement with a major publishing house, he has

indicated that the network versions will continue to be available.

What the world needs is a good book on the hardware side of ethernets -- installing, expanding, maintaining, and debugging. Unfortunately there is no such beast. This review will discuss two available texts which cover the physical side of ethernet.

This book, written in 1988, covers the physical end of various flavours of ethernets. It contains a great deal of good material and some non-technical material which can safely be ignored. It has some lacks, but the book is quite useful in spite of them.

When the book sticks to purely physical and technical topics it is excellent. It's most valuable feature is the detailed treatment on the physical handling of an ethernet. It include step by step instructions with photographs and drawings on a number of topics, including:

- How to make taps
- How to debug physical and electrical problems using TDRs and various other test equipment. The section on TDRs includes photographs showing the traces from various sorts of ethernet hardware in both proper and defective operation.
- Drawings and pictures of various common cables and other connection hardware

and so on. From this book I was able to correctly install a thick ethernet transceiver, having never even seen the tools before.

In addition to the excellent instructions, the book is rich with diagrams, charts, and tables of physical constants. They're often worth as much as the text.

The book contains a number of sample forms and recommendations for managing the physical cable plant. These should all be of great use to any working administrator.

Unfortunately the book has a number of problems. Nemzow is a firm believer in broadband ethernet and gives it equal play with thicknet, Cheapernet, and thin ethernet. He discusses fibre, but at a much lower level of detail; 10baseT is almost completely ignored. Given the time at which he wrote the book these last two points are somewhat forgivable, but the lack of data on 10baseT lengths is particularly frustrating.

Nemzow spends a great deal of time talking about the usefulness of networks. The material not needed, appropriate, or accurate. Fortunately it's easy to skip over.

In summary, this is easily the best of what I've seen on the hardware side of ethernet management. It is not a great book, but nonetheless is a valuable addition to your library. A second edition with updates could be a major seller.

Telecommunication Wiring
Clyde N. Herrick and C. Lee McKim
Prentice-Hall, 1992, ISBN 0-13-151531-4
253 pages, Hardback

Reviewed by Steve Simmons

I ordered this on the basis of a flier from Prentice-Hall which touted it for the physical end of computer network management. The back cover reiterates this claim. Unfortunately the contents do no live up to the claims.

This book has major flaws for anyone using at a guide for computer network installation. It repeatedly mentions using coaxial wiring for cable TV, mentions that ethernet runs over coaxial cable, but never mentions that the two require different sorts of cable.

Similar problems can be found with the telephony wiring sections. No mention is made that one might want to wire telephony systems somewhat differently from 10baseT or RS-232.

In short, this is a most disappointing book for the computer network management. Not recommended.

UNIX System V, Release 4, Leitfaden fuer Benutzer,
AT&T UNIX System Laboratories, Inc.,
Prentice Hall, 1991, ISBN 13-929696-4
Carl Hanser Verlag, 1991, ISBN 3-446-16254-2 Soft Back

UNIX System V, Release 4, Referenzhandbuch fuer
Programmierer,
AT&T UNIX System Laboratories, Inc.,
Prentice Hall, 1991, ISBN 13-929704-9
Carl Hanser Verlag, 1991, ISBN 3-446-16259-3
Soft Back

Reviewed by Margot Mangerich of InterFace Computer, Munich

E-mail margot@ifcom.uucp

This is the German version of the UNIX System V, Release 4 documentation from AT&T. I looked at the User's Guide and the Programmer's Reference. Also available are the following:

- Leitfaden fuer die Systemneuerungen (I guess this is the Migration Guide)
- Referenzhandbuch fuer Benutzer (Programmer's Reference Manual)
- Netzwerke-Leitfaden fuer Benutzer und Verwalter (Network User's and Administrators Guide)
- Leitfaden fuer Programmierer: POSIX-Konformitaet (Programmer's Guide: POSIX Conformance)
- Leitfaden fuer Programmierer: Netzwerk-Schnittstellen (Programmer's Guide: Network Interfaces)

- Leitfaden fuer Programmierer: ANSI-C und Programmierwerkzeuge (Programmer's Guide: ANSI C and Programming Support Tools)

When I see the German translation of a book on computer science, I'm always sceptical. As a German computer scientist, you have to be familiar with the English terminology. For many words there is, in fact, no satisfactory translation. So the translation of books on computer science often results in a strange mixture of English and German.

The two manuals I read are quite well translated. They are both written in an understandable style and the translations of the technical terms are well chosen.

I'm not sure whether there really is a need for German UNIX documentation. For the User's Guide, this may be true. This is a book for very novice UNIX users or even people using a computer for the very first time.

The book is well structured: It contains an introductory part on the main UNIX concepts and eight tutorials, that should be worked through sitting at a terminal. Topics covered in the tutorials section are FACE-Office, the System V Release 4 desktop interface, ed, vi, lp, sh, awk, mail and some easy networking features.

Each tutorial is divided into short lessons with exercises and a command summary in the end. The book contains several appendices with very practical summaries of the most important UNIX commands and summaries of FACE, ed, vi and sh. Besides there is a glossary explaining some important terms from UNIX and computer science in general. Unfortunately the tutorial part contains a number of typing errors in the commands examples, which might be very confusing for a novice user.

Release 4 contains a lot of new features compared to earlier UNIX versions. The Reference Manual is huge, but it does not give you an overview about what is new. You won't find any references to changes.

The manual is kept in the usual form: It is divided into five parts covering commands, system calls, libraries, file formats and various mixed topics like macro packages, character tables and so on. The single manual pages are kept quite short. This is a manual to consult if you run into a problem, it should not be used as a textbook.

Now, who should buy these books? If you are not using UNIX you won't need them, but if you are, you probably already have a manual! But nowadays, if you buy a UNIX system you often have to pay extra for every manual that you want. If you have to choose which manual to buy; The Programmer's Reference is certainly the UNIX manual mostly used. Even if you are not programming but only using UNIX, you will need the commands section sometimes. If you are new to UNIX, the User's Guide will give you a good introduction, but if you are only new to System V Release 4, you can get along without it.

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EurOpenD13	42/60.00	60/86	
EurOpenD14	42/60.00	60/86	
EurOpenD15	80/120.00	120/172	
EurOpenD16	42/60.00	60/86	
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1992 UniForum Products Directory	70.00	105	
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Calendar of UNIX Events

The information here is collected by those listed below after an idea by John S. Quarterman of Texas Internet Consulting.

If you have a UNIX related event that you wish to publicise then contact either Alain Williams at addw@phcomp.co.uk or Carolyn Carr at carolyn@usenix.org giving brief details in the style that follows.

1992

September 8-11	AUUG, *World Congress Centre*, Melbourne, Australia
September 14-17	USENIX, Security, *Baltimore*, Maryland, USA
September 24	DKUUG, Office Automation, København, Denmark'
September 22-24	GUUG, *Wiesbaden, Germany*
September 22-24	Bruno Blenheim Inc, UNIX Expo, New York, USA
Autumn	USENIX, Security III, *Location* unknown
Autumn	ISO/IEC JTC1 SC22 WG15, *Denmark*
Autumn	NUUG, *Norway*
Autumn	SUUG, *Soviet Union*
October 5-9	NLUUG, Efficiency fair, *RAI* Amsterdam, The Netherlands
October 6	WG15, *Denmark*
October 19-23	USENIX, System Administration, Long Beach, California, USA
October 19-23	IEEE 1003, *Montreux (location tentative)*
October 26-30	Interop, *Moscone, California*, USA
October 29	DKUUG, Workstations, *Odense*, Denmark
November 25-27	EurOpen/UniForum, *Utrecht*, Netherlands
Non 26	DKUUG, Annuam Meeting, København, Denmark
December	TNUUG, *Tunisia*
December	UKUUG/UKnet, *Manchester, UK*

1993

January 11-15	TCOS WG, *New Orleans, Louisiana*, USA (location tentative)
January 25-29	USENIX, *Town & Country, San Diego*, California, USA
March 15-18	UniForum, *Moscone Center, San Francisco*, California, USA
March 24-31	CeBIT 93, *Hannover, Germany*
April 5-19	TCOS WG, *Boston, Massachusetts*, USA (location tentative)
May 3-7	EurOpen, *Seville, Spain*
June 21-25	USENIX, *Cincinnati, Ohio, USA*
July 12-16	TCOS WG, *Hawaii (location tentative)*
Autumn	Europen/UniForum, *Utrecht, The* Netherlands
October 18-22	TCOS WG, *Atlanta, USA (location tentative)*
October 25-29	Interop, *Moscone, California*, USA

1994

January 17-21	USENIX, *Hilton, San Francisco*, California, USA
February 14-17	UniForum, *Dallas, Texas*, USA
March 16-23	CeBIT 94, *Hannover, Germany*
March 23-25	UniForum, *San Francisco, California*, USA
April 18-22	EurOpen, *Switzerland (tentative)*
June 6-10	USENIX, *Boston, Massachusetts, USA*
September 12-16	Interop, *Moscone., California*, USA
Autumn	Europen/UniForum, *Utrecht, The* Netherlands

1995

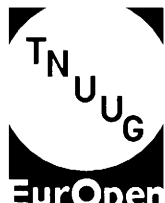|	
January 16-20	USENIX, *Marriott, New Orleans*, Louisiana, USA
February 21-23	UniForum, *Dallas, Texas*, USA
May 1-5	EurOpen, *Scotland (tentative)*
June 19-22	USENIX, *Hilton, San Franciso*, California, USA
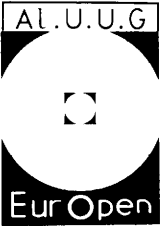
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