

Annual Report 1993-1994



EUROPEAN **A**CADEMIC & **R**ESARCH **N**ETWORK

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1994 Executive Committee

Standing from left:	T. Hofmoki	F. Greisen President	P. Bryant General Secretary	D. Bovio Technical Manager
Sitting from left:	P. Amorim	A. Cohen Vice-President	M. Sommani Treasurer	

Not shown: J.-L. Delhay

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President's Report

For technologically emerging countries in Europe, the Middle East, and Africa, EARN is the association that first connects the university and research sector to the networked world. In the past year EARN has connected Algeria, Azerbaijan, and Croatia bringing the number of connected member countries to 35, while ten other countries have formally been admitted as members without yet being able to organize a connection. However, many of these countries have already benefited from workshops in networking technology as part of EARN's new countries program.

While NJE is still a useful option for low cost connectivity, it is clear that the number of NJE systems in our community is now decreasing. EARN has examined and cooperated in the development of various tools for migration of the most important services from NJE to other platforms. The tools include Listserv for VMS and Unix and a PC card able to run VM/NJE which has been developed by CREN, EARN's sister organization in the US.

EARN has continued the emphasis on end user services. The successful Guide to Network Resource Tools has been accepted as an informational RFC and the third edition has been published both in print and on the network. In continuation of our tradition, EARN organized the second Network Services Conference in Warsaw last year and this year's conference, NSC'94, is being held in London in November.

EARN was formally established in February 1985 and, in the light of rapid developments in networking, it is not surprising that after ten years EARN is now re-examining its mission and its formal basis. We have actually worked on this for some years and the plan, subject to ratification by the appropriate managing bodies, is that EARN will merge with RARE (Réseaux Associés de la Recherche Européenne) into a new organization which at the time of writing goes under the name of NewOrg. Please see the separate section on the merger which I'm convinced will lead to a strong new organization which can both carry the legacy from EARN and introduce exciting new network services.

Frode Greisen
President

Merger between EARN and RARE

For several years, there have been suggestions that EARN and RARE (Réseaux Associés de la Recherche Européenne) work closer together or even merge into one organization. This was suggested because there is considerable overlap in the mission of the two organizations. About a year ago, the boards of both organizations found that now was the time for action and asked their executives to work out plans for a merger.

The status at the time of writing is that a new organization which we've called NewOrg until the result of a competition to find a new name has been terminated will be set up on 20 October 1994. Technically, this will be done by transforming RARE into the new organization but in a way that all history of RARE is discarded and an entirely new organization is established. Next the EARN staff, assets and liabilities will be transferred to NewOrg and ultimately EARN will be terminated. The statutes, mission and structure of NewOrg has been worked out by the two executives in a way that keeps the most valuable activities and discards those activities which were not successful or have been overtaken by events.

Membership in NewOrg is open to organizations all over the world but there is no ambition to get a global coverage and activities will have a focus on Europe.

In working out the budget, care has been taken that the subscription is kept as low as possible by only including in the basic budget such activities which are important for all countries. Other activities can be done in projects or cost centers with special contributions from those members who really want these activities done. As many countries do not see NJE as strategic any more, the NJE coordination will be done in a cost center by special funding, in a way similar to the one that is evolving for the RIPE NCC.

Of course, until all formal decisions have been taken, the EARN that you know still exists. The coming board meeting on Nov.30 to Dec. 1 is, however, expected to decide according to the plan described above and after that, the first and last EARN general assembly which consists of representatives of all the EARN nodes is expected to take the final steps about ten years after EARN was created.

For those who have worked enthusiastically for EARN for many years, it may be sad to see the EARN name disappear. However, we should be proud that EARN was successful for a much longer time than many networkers expected in the eighties and we should be confident that the EARN services will be continued in the new organization.

The Global Update & Monitoring Network Coordination Center

During the spring meeting in Darmstadt the EARN Board of Directors decided in principle to set up an independent entity to provide:

- worldwide (i.e., EARN, BITNET, NetNorth, CAREN, and all associated NJE networks) coordination of NJE network services, including all necessary activities related to maintenance, monitoring, and modification.
- worldwide coordination of backbone server services, such as DISTRIBUTE.

The proposal has been developed by the EARN Executive in response to requests from the Board to investigate the possibility of creating a separate entity for these activities in preparation of the merger between EARN and RARE. The entity shall be responsible for activities related to the management of:

- The BITEARN NODES file
- The DOMAIN NAMES file
- The SERVICE NAMES file
- Monitoring of the NJE Interregional backbone

The BITEARN NODES file contains all node information necessary to generate the NJE routing tables, as well as information about the contact person at each node. For a detailed description of the contents of this file please refer to the "Nodes File Format and Contents" document, available from any NETSERV as NEWTAGS DESCRIPT.

The DOMAIN NAMES file contains all the information necessary to allow mail exchange with non-BITNET-connected hosts. EARN/BITNET support of domain-style names is accomplished by using programs that reference domain routing information tables which map domain-style names to network nodes/gateways. For a detailed description of the contents of this file, please refer to the "Domain Names for EARN/BITNET Members" document available from LISTSERV@BITNIC as DOMAIN GUIDE.

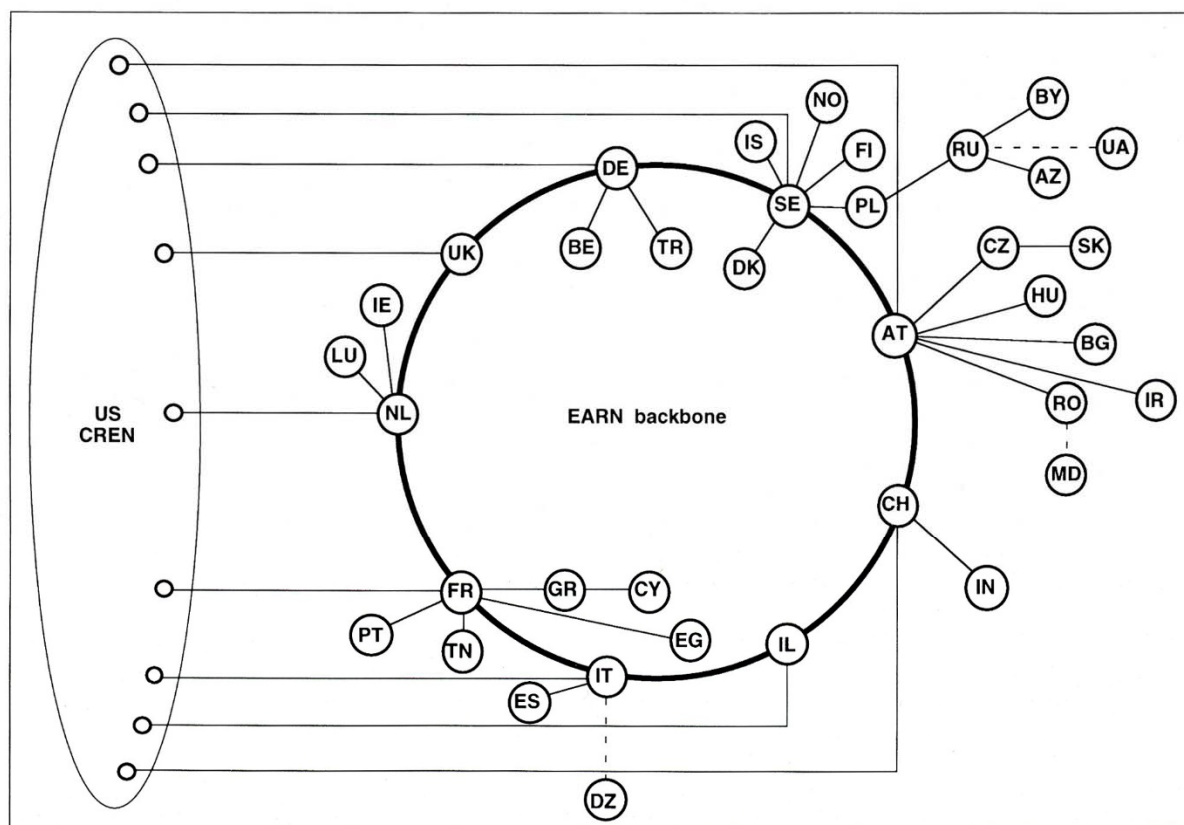
The SERVICE NAMES file contains all the information necessary to map RFC822 style addresses to network servers performing the DISTRIBUTE function (e.g., LISTSERV). For a detailed description of the contents of this file, please refer to the "Service Names for EARN/BITNET Members" document available from LISTSERV@EARNCC as SERVICE GUIDE.

The NJE Interregional backbone is based on a set of core sites. A network monitor (HIMON) which collects data about various aspect of the network performance is installed at many core sites. For a detailed description of the HIMON monitor functions and of the postprocessing procedures for the generation of weekly and monthly reports please refer to the paper: "Monitoring EARN networking Services", Computer Networks and ISDN Systems 26 (1993) 343-348, North-Holland (requests for a copy of the paper should be sent by e-mail to hi@earncc.earn.net).

A list of detailed activities for each of the above is available from LISTSERV@EARNCC.EARN.NET as paper BOD6 94.

Details about the implementation of this structure, as well as its financing model, are currently being studied by the EARN Executive. As agreed during the joint EARN Bod and RARE CoA meeting in Darmstadt, the GUM-NCC will be organized under the umbrella of NewOrg, the new association being formed by the merger of EARN and RARE. It is important to note that one need not be a member of NewOrg in order to participate in the financing of the GUM-NCC, and thus utilise its services, as this is seen as a completely separate and independent activity, not financed by the NewOrg membership fees. The target date for implementation is 1 January 1995.

EARN countries and their virtual links



In addition, each country on the circle (or EARN backbone) has complete connectivity with every other country on the circle. This configuration of network links (also called a full mesh) is comprised almost exclusively of virtual NJE over IP links. Most of these links run over the IP backbone for Research and Education (Ebone), and Europanet. The transatlantic links run over IP links provided by Ebone partners and NSFnet, and Europanet. Countries are denoted by their two letter ISO code.

Countries to be connected in 1994: Albania, Cameroon, Croatia, Georgia, Jordan, Lithuania, Morocco, Pakistan, Former Yugoslavian Republic of Macedonia, and Syria.

Technical Work in EARN

Since March 1990 the work of the EARN Technical Groups has been heavily supported by manpower made available at the EARN Office. Many changes in the EARN Office structure have taken place in the last 12 months. Greg Lloyd, technical staff member, left the Office at the end of September 1993, and was replaced at the beginning of March 1994 by Bill Ranck. In addition, Jean Ritchie, from Edinburgh University, joined the staff as part-time technical writer on 1 January 1994. In the framework of the New Countries Program, EARN also secured the services of Maciej Kozlowsky from Copernicus Center, Warsaw as part-time consultant.

EARN Permanent Groups

EARN NOG

The EARN Network Operations Group (EARN NOG) was established in 1987. The group is responsible for the operations of the EARN international backbone and has to approve all technical changes on EARN international connections as well as any proposed EARN technical directive or recommendation.

The NOG membership is comprised of:

- One Network Country Coordinator (NCC) per country, and possibly an NCC deputy. The NCC is technically responsible for EARN in his/her country.
- The EARN Technical Manager, who chairs the group.
- The EARN Staff
- Developers of major software tools used by EARN.

The EARN NOG meets twice a year, in conjunction with other EARN technical meetings, usually before the BoD meetings. For each meeting, minutes are produced and made available electronically.

The EARN NOG met twice during the last 12 months, in Warsaw (October 1993) and in Darmstadt (May 1994). During these meetings the group focused on the use of NJE today and in the future. Each NCC reported on the current situation in her/his country in terms of number of nodes and use of services, and on the plans for the next 2 years. While it could be clearly seen that in the vast majority of countries the number of NJE connection is decreasing, it was also obvious that everywhere the demand for services run on top of NJE (e.g. LISTSERV and BITFTP) has not diminished. On the contrary, in several countries, the demand is growing quite fast. Moreover, it turned out that in the vast majority of the countries represented, there are plans to maintain international NJE connectivity at least until the end of 1995. Many countries will then reevaluate their position regarding NJE services at that time. As an outcome of the discussion the NOG recommended to the Board a revision of the EARN charging model, which being based on the number of nodes, was considered no longer correct and fair.

The NOG also discussed the newly available Unix list servers and the impact of the general availability of the CREN listproc and L-Soft Listserv for Unix on the users. The NOG stressed that it is extremely important for EARN to acquire test copies of CREN Listproc to compare the 2 products, and consequently offer advice to the EARN members.

In discussion of the technical structure of the new association, the group expressed grave concerns regarding the proposed structure, which does not adequately address the needs of the community which EARN had always served. In particular, the proposed technical structure doesn't address the service coordination and support issues which the NOG felt were fundamental. These concerns were reported to the Board of Directors.

The NOG endorsed the proposed future organization of NJE services (see the detailed proposal in this booklet) and welcomed the proposed task organization. The NOG emphasized that the EARN Staff currently in charge of the tasks should be allowed to continue their work beyond 1994.

EARN INFO

The most important task of the EARN Permanent Group on Information Services (EARNINFO) has been a review and discussion of the documentation modules produced by the EARN Staff. Several suggestions were put forward by Info group members, which were subsequently adopted by the staff. As new modules are produced, they are available first to

EARNINFO members only, and after EARNINFO comments and criticisms have been taken into consideration, the modules are made public and included in published EARN documents.

EARN Project Groups

EARN RPG

At its last meeting (spring 1994 in Darmstadt), the group concluded that a point has been reached where the operational tasks related to the EARN2 Regions structure can and should be transferred to the Network Operations Group (NOG) for further handling. It was a common understanding, however, that the RPG members should continue to work, discussing and meeting, in order to solve future problems as a technical task-force inside the NOG. The NOG approved the proposal.

Thanks to the RPG's knowledgeable members, EARN was able to provide a better service to its own users as well as to the cooperating networks. Besides giving credits to its members, the RPG chairman, Ulrich Giese, and the Regionalization plan coordinator, Daniele Bovio, would like to express their special thanks to Michael Gettes (Princeton University, USA) for his help and ideas which have made the results of the EARN-RPG so successful.

EARN PEG

The EARN Performance Evaluation Project Group met in conjunction with the NOG and RPG, both in Warsaw and in Darmstadt. Once again, it was pointed out that an increasing number of EARN services are being accessed through direct connections with cooperating networks and thus are invisible to NJE traffic volume collection techniques. The EARN-PEG continued to work on a new strategy for measuring the use of EARN services based on the number of server requests processed rather than by traffic volume. A set of statistics concerning LISTSERV usage is shown in the Statistics chapter. The group also decided to modify the HIMON monitor in order to collect statistics at the IP level for link availability. Work is underway and the results will be published on the public list EARNSTAT@EARNCC.EARN.NET, along with the others reports, as soon as the modifications to the monitor are completed.

EARN Special Interest Groups

These groups have been started informally by the EARN technical community and are organised as open lists of those interested in the subject. The existing groups fall mainly in the area of the EARN services. The currently active groups are NETSERV, RED (related to Trickle services), and UFT-L (group for the study of an unsolicited file transfer mechanism similar to SENDFILE for the Internet).

EARN Visitors Program

In March 1994, a session of the EARN Visitors Program was held. The program was attended by 6 invited representatives from: Azerbaijan, Algeria, and the Former Yugoslavian Republic of Macedonia, and by 2 external participants. EARN Staff, reinforced by former EARN Staff member N. O'Reilly, D. Karrenberg, RIPE-NCC Manager, Y. Devillers from INRIA, and M. Jabouley from CISCO ran the tutorials, hands-on sessions, and informal question and answer sessions.

All teachers enjoyed working with the strongly motivated and enthusiastic participants, who contributed significantly to the success of the workshop. Unfortunately, despite the fact that the invitation letters were sent at the end of December 1993, representatives from several former Soviet republics were not able to get their visas on time and thus were not able to attend the workshop.

Another session of the Visitors Program is scheduled for October 1994 in Warsaw in order to give those who missed the spring workshop as well as representatives from other countries to be connected during 1994 and 1995, a chance to benefit from the workshop.

EARN Services

EARN Staff Documentation Work

The focus and emphasis of the documentation effort has evolved since its original conception. This evolution parallels the changing emphasis within EARN. The original documentation plan was designed for NJE-only users. However, as more and more EARN users gained Internet connectivity, it became clear that our user documentation must reflect this change without abandoning users with NJE-only connectivity.

Thus, it was decided that serious documentation work was needed for Listserv, as the documentation that comes with the Listserv software package is outdated and insufficient. At first, documentation was produced for the huge mass of Listserv users: people who are subscribed to any of the thousands of Listserv lists currently in existence. The **LISTSERV Users Guide** and two short guides on Listserv are available electronically in both plain text and PostScript formats, and in hardcopy. Work is currently underway on a comprehensive Listserv list owners guide, containing full, updated information for those who manage Listserv lists.

Documentation modules for the major new user tools in the Internet (archie, Gopher, WAIS and WWW) have also been produced by EARN Staff. These modules, along with modules on other user tools (such as Listserv and Netserv), have been compiled into one comprehensive users guide to networking tools. The first version of the **Guide to Network Resource Tools** was released, both electronically and in hardcopy, in May 1993. This guide has aroused much interest throughout the network and has garnered much praise. An expanded and improved second edition of the guide was produced. It was announced and first distributed in hardcopy format at NSC'93 in Warsaw in October 1993. In January 1994, a version of the Guide based on the second edition, was released as an official Internet "For Your Information" document (FYI2) and as an informational RFC (RFC1580). Work has continued on the guide, and an expanded and updated third edition was released electronically in April 1994. The hardcopy version of the third edition was distributed, amidst critical acclaim, at INET/JENC in Prague in June 1994, as well as at conferences, meetings and workshops throughout the world. All told, more than 30,000 copies of the Guide have been printed and distributed in EARN member countries. Translations of the Guide in Russian and Czech are already available, and translations into other languages are underway.

An even larger audience has benefited from the electronic versions of the Guide. Any user can get the Guide, in plain text or PostScript format, via Listserv. The Guide is also available via Gopher, allowing one to search for a particular address or get information on a specific networking tool easily.

In 1994, much effort has gone into producing a World-Wide Web version of the Guide, accessible via Mosaic and other WWW clients. With this version, one can try out the various networking tools and get the freely available software, as well as reading and learning about the tools. This version is constantly updated to reflect the changes in the network. The URL identifier is: <http://www.earn.net/gnrt/notice.html>

The EARN Staff plans to continue to update, improve and expand the Guide to Network Research Tools. In addition, a new comprehensive guide to freely available networking software is being produced for distribution in EARN member countries. The production of top-quality documentation continues to be one of the top priorities of the EARN Staff.

The EARN Information Service

The EARN Information Service consists of an anonymous FTP server (<ftp.earn.net>), a Gopher server (<gopher.earn.net>), a World-Wide Web server (www.earn.net), and a file repository. This service is provided by the EARN Office on the Sun workstations. The anonymous FTP server and the Gopher server started running at the end of 1993, and the World-Wide Web server has been open for public access since April 1994.

Until the end of 1993, the documents produced by the EARN Association (official EARN documents, minutes of EARN meetings, EARNest, EARN user documentation, etc.) were only available from the **LISTSERV** file server at listserv@earncc.earn.net, but the EARN Association was interested in allowing access to its documents using the most popular Internet tools.

Therefore, the first step was the creation of a file repository on the workstations to allow an anonymous FTP access to the EARN documents. The file repository mirrored the contents of the **LISTSERV** file server. The second step was easy to achieve: a Gopher access was added to facilitate the navigation in the file hierarchy. Using Gopher, a user can also consult

publicly available LISTSERV list archives maintained at various locations, access other networking related information services (RIPE, Internic, Internet Society, etc.), and get information on EARN/Bitnet nodes. Full-text indexes facilitate the search on the monthly lists of node changes, on the EARN papers and on EARNEST issues.

For the World-Wide Web server, the approach was different: the accessed information is only a subset of the EARN documents, but in a format (HTML) which takes full advantage of the Web browsers. The "Guide to Network Resource Tools" and the "LISTSERV User Guide" have been translated into the HTML format.

Users who don't have an interactive connection to the Internet can use the Gophermail service to exploit the Gopherspace. This service is available to anyone who can send electronic mail to the Internet (and receive mail from it). They get information not only from the EARN Gopher server but also from other Gopher servers around the world.

All together the anonymous FTP, the Gopher and the Web servers transmitted 31,222 files and 695MB between January and June 1994. During the same period, the Gophermail service handled 26,623 requests and accessed 1,395 other Gopher servers around the network. The most requested items are those related to the "Guide to Network Resource Tools" and to the "LISTSERV User Guide". Users from more than 50 countries, as far away as Chile, South Africa, Malaysia, and Bahrain have used the EARN Information Service.

NETHELP - The Network Accessible Help Desk

Users, as well as system administrators throughout EARN, often come across problems in dealing with the network and have no local source of help to turn to. EARN decided to address this problem by offering a Net-consulting Help Desk service. The service has been available since spring 1993 and, after a pilot phase, is being continued through 1994. The service is free of charge and limited to users in EARN countries.

A Network Consulting Team (NCT) has been established to handle questions from users and is available via e-mail. The NCT is composed of EARN Staff and external consultants and is mandated to handle questions and problems related to the realm of networking. The helpdesk is managed through a LISTSERV list; in order to submit questions to the NCT, users send electronic mail to NETHELP@EARNCC.EARN.NET.

Since its inception, Nethelp has proven to be useful for users in more than 20 different countries, and especially for users in Central and Eastern European and Middle Eastern countries. The service has also been exploited by existing national helpdesks, both as a source of information for NJE related issues and as second level support. During 1994, a Nethelp Frequently Asked Questions document has also been produced and distributed. The document is stored on listserv@earncc.earn.net as NETHELP FAQ.

Conferences

In October, 1993, EARN held the second annual Network Services Conference in Warsaw, Poland. NSC'93 followed the highly successful first Network Services Conference in Pisa, Italy in November, 1992. Participants from more than 25 countries gathered together in Warsaw to enjoy lectures, tutorials, panel discussions, demonstrations and posters, all connected to issues of information services, network resource and discovery tools and user support on the net.

NSC'94, to be held 28-30 November 1994 in London, will continue the tradition of its predecessors and expand on it. The conference will be at the Great Western Royal Hotel near Paddington Station. An excellent technical and social programme has been organised, and this year, for the first time, a special issue of the journal Computer Networks for Research in Europe (CNRE), published by Elsevier, containing selected papers from among the conference presentations will be prepared in advance and should be ready for distribution at the conference.

Statistics

Traffic Report

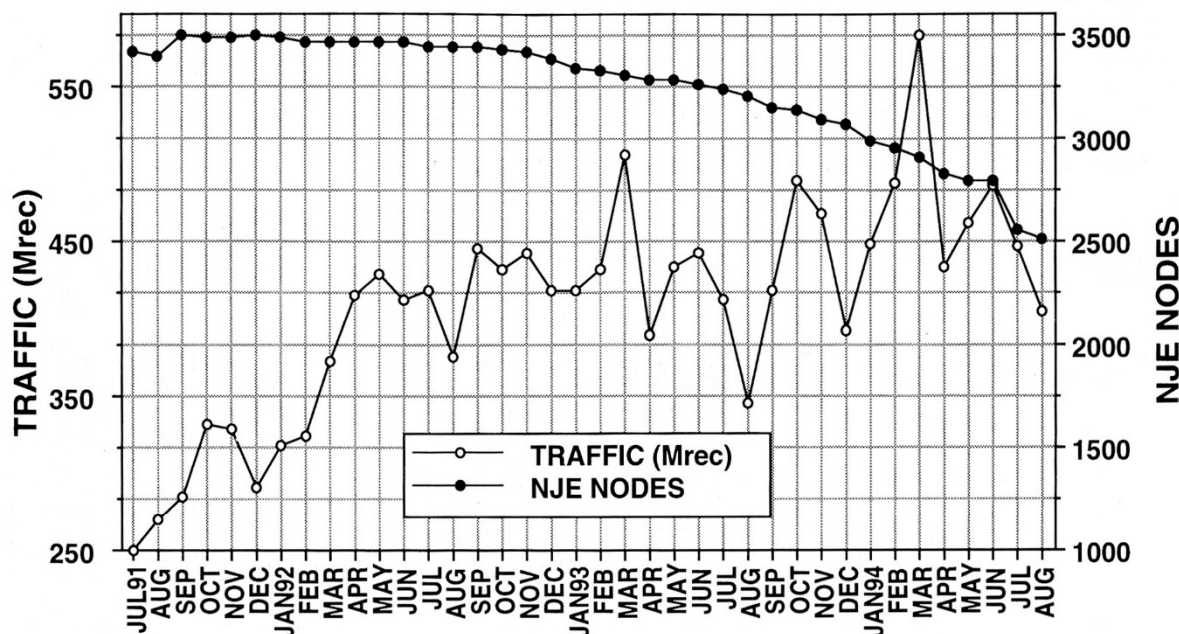
EARN collects traffic figures on international network links. These statistics are useful for showing the load on network links and to identify the need for link upgrades, server relocations or changes to the network topology.

Each international EARN node takes on the obligation of collecting the traffic data for its own set of international links. This is done on a monthly basis. This data is then delivered to the EARN Office for further processing. Although not all international EARN nodes are able to carry out this procedure, sufficient redundancy in the collection of traffic data allows an accurate proxy computation to be made on behalf of such sites. Table 1 shows the traffic for 1993 and a comparison with the same data from 1992.

Country	1993	%	1992	Country	1993	%	1992
Argentina	106	0.0	97	Italy	429772	4.2	486437
Austria	440968	4.4	660094	Japan	6905	0.0	7301
Bahrain	93	0.0	20	Korea, Republic of	3284	0.0	3276
Belgium	484171	4.8	469500	Kuwait	0	0.0	1
Brasil	20280	0.2	13090	Luxembourg	12261	0.1	12313
Bulgaria	15025	0.1	3090	Malaysia	585	0.0	37
Canada	38871	0.3	45453	Mexico	2233	0.0	2046
Chile	1841	0.0	1440	Netherlands	613870	6.1	610827
Colombia	2265	0.0	840	Norway	62657	0.6	57102
Costa Rica	818	0.0	305	Poland	207740	2.0	116341
Cyprus	31637	0.3	12070	Portugal	45129	0.4	42727
Czech R.+Slovakia	132140	1.3	140584	Puerto Rico	8058	0.0	103
Denmark	80497	0.8	135647	Romania	20863	0.2	291
Egypt	45358	0.4	25050	Russian Federation	43125	0.4	1264
Finland	128896	1.2	102448	Saudi Arabia	9284	0.0	622
France	1029331	10.2	920201	Singapore	47973	0.4	1620
Germany	1565307	15.6	1420376	Spain	300002	3.0	210699
Greece	108067	1.0	116362	Sweden	506814	5.0	412762
Hong Kong	838	0.0	1300	Switzerland	596351	5.9	708248
Hungary	99416	0.9	65524	Taiwan	4498	0.0	3892
Iceland	1	0.0	6	Tunisia	2809	0.0	2244
India	23157	0.2	34764	Turkey	346867	3.4	323040
Iran	11139	0.1	59	United Kingdom	585515	5.8	447592
Ireland	158908	1.5	163649	United States	1202890	12.0	1246086
Israel	493844	4.9	504004	Yugoslavia	0	0.0	76346

Table 1 : Summary of records sent and received between 1/93 and 12/93 (*1000)

Graph 1 shows the overall traffic figures in records sent and received at all EARN international sites (each record can hold up to eighty bytes of data) versus the number of nodes in the global NJE network.



Graph 1 : Traffic Volume (Sent and Received) vs Number of NJE nodes.

As can be observed from the figures, the overall traffic volume across the network continues to increase, despite the fact that the absolute number of NJE nodes is decreasing. This shows that the usage of the NJE international backbone is no longer related to the number of users with NJE addresses, but rather to the number of users connected to the global Internet who are making use of servers such as LISTSERV, BITFTP, and TRICKLE. It must also be noted that these figures do not represent the entire measurement of EARN services rendered. An increasing quantity of EARN services are being accessed through direct connections with cooperating networks and thus are not present in these NJE traffic figures.

The Network performance Index (NPI)

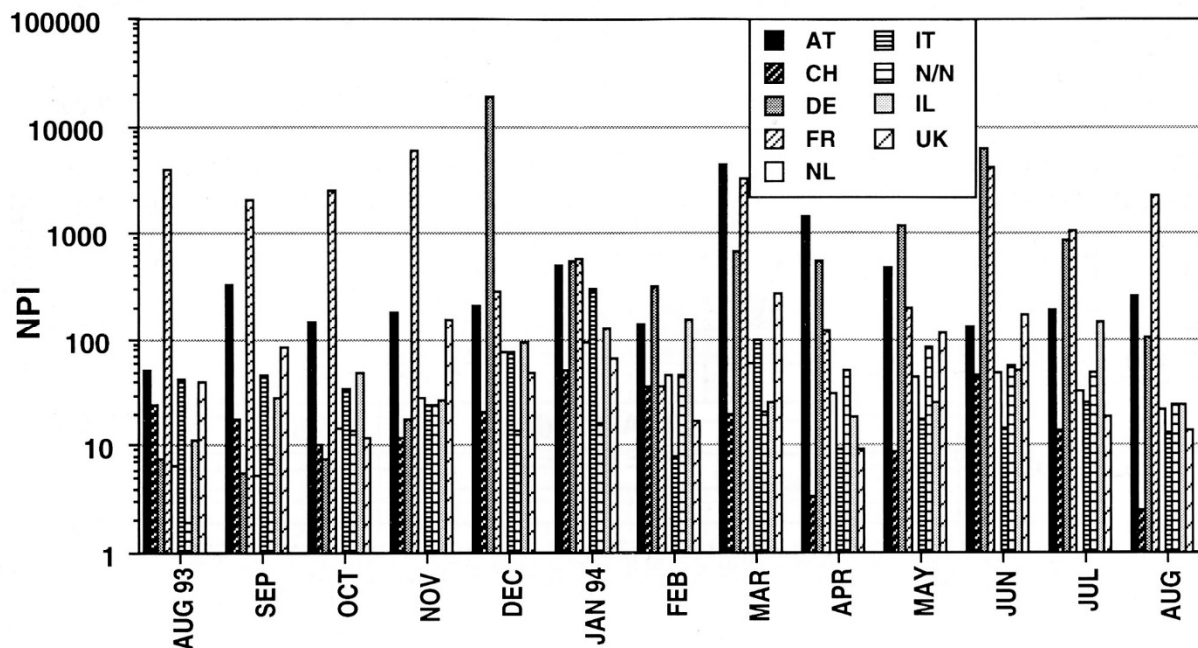
Since June 1992, EARN has been measuring network performance via the newly developed HIMON monitor. HIMON monitors the status of all network links and their associated file queues every ten minutes. Thanks to the work of the EARN staff in conjunction with the EARN Performance Evaluation Group (EARN PEG), different aspects of the monitoring activities have been combined to produce a Network Performance Index (NPI). The NPI is designed to give "at a glance" the status of the "health" of the network. It is published along with other detailed performance reports by the EARN Office.

The NPI values can range theoretically from 0 (best) to 8 billion (worst). The target value being 11. The algorithm takes into account averages for link availability, queued files, and round trip times for mail and files. The nature of the algorithm is such that the NPI value increases exponentially should any corresponding increases occur in the above parameters. Details on the definition of the NPI can be found in paper EXEC36 93.

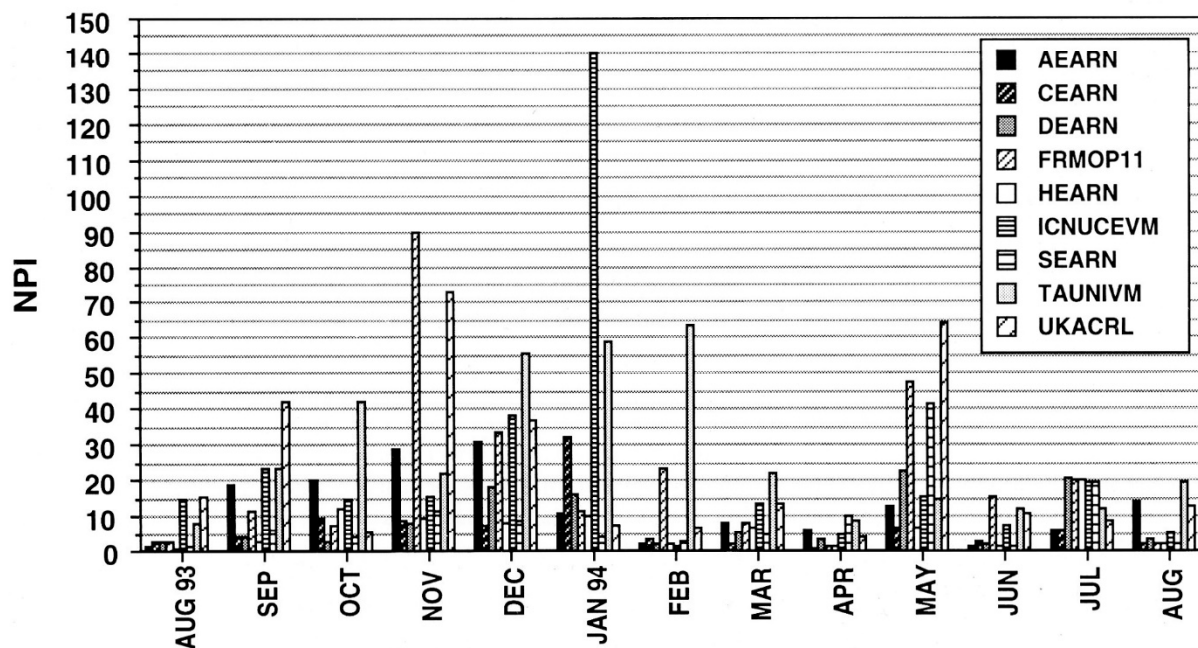
During the EARN PEG meeting held in Trondheim during May 1993, it was decided that while a general NPI (that encompasses the entire EARN network) provides an overview of the network's performance, a more valuable and meaningful use of the NPI would be in its application to individual network regions. The notion of applying a set of threshold values on the general NPI that categorizes network performance loses credibility in the face of a diverging range of expectations (due to diverse circumstances within national networks) as to what level of performance is acceptable and what is not. The use of NPI values on a regional basis (that is, on the performance of that subsection of the EARN network within each region) allows for both the accommodation of atypical network links when judging a region's performance and gives the means to make a comparison between the performance of the core nodes (over the homogeneous core network infrastructure).

Two different sets of NPI values are therefore produced, the Regional NPI and the Core NPI. The regional figures take into

account all the links within the region (i.e., including the connections to the other core sites and the US). The core figures take into account only the links to other core sites (i.e., into the full mesh structure) excluding the one with the worst performance of the month (in order to avoid a “normalization” to the worst value). Graph 2 and 3 show the NPI breakdown by region and by core site.



Graph 2 : The Region NPI



Graph 3 : The Core NPI

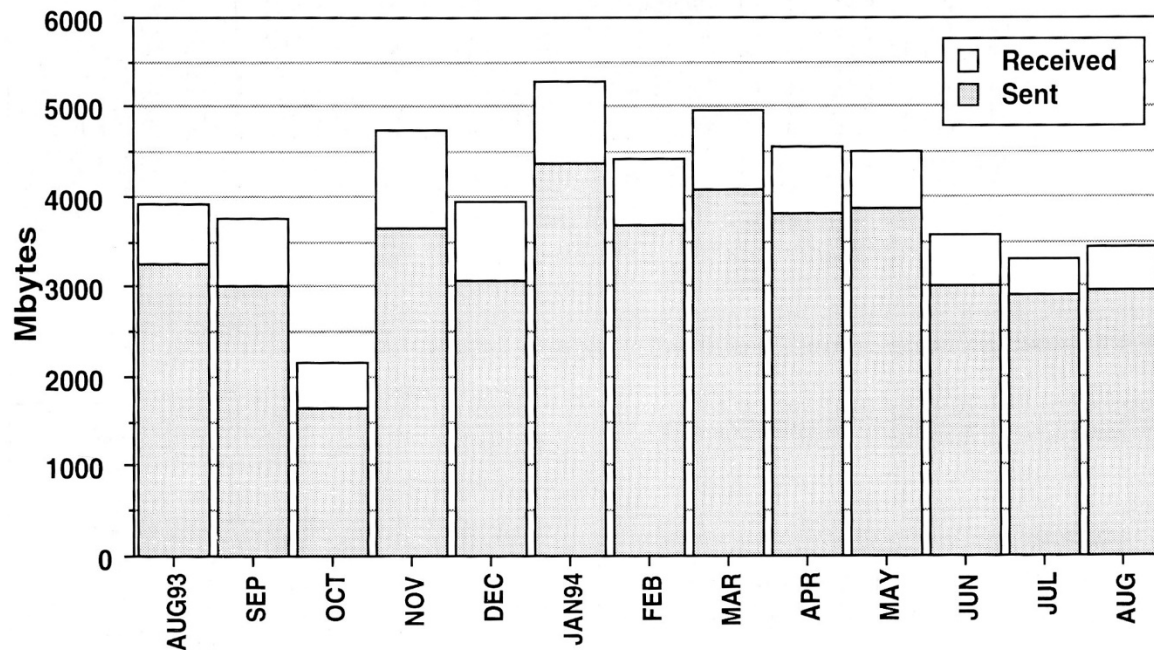
It appears quite clear that there is a dramatic difference in performance between the core structure and the regions. Almost constantly, in fact, there is a difference of at least one order of magnitude. While the NPI inside the core structure, excluding few selected cases, can be considered very satisfactory, the NPI for the regions shows that the level of service offered is far to be optimal in many cases. The causes of this unsatisfactory situation are often outside the control of the Network Country Coordinators, being related to the poor quality of international network lines, as provided by the local PTTs, which sometime experience long outage periods.

Trickle statistics

Trickle is a server that mirrors popular software archives accessible via FTP and caches recently requested files for faster delivery. It has advanced features such as shared cached disks, generation of "New File Listing" reports, accepting subscriptions to files stored at FTP sites, and delivering files to the user's PC or workstation via FTP.

In Europe, Trickle servers are located in Austria, France, Germany, Israel, Italy, the Netherlands, Poland, Sweden, Turkey, and United Kingdom.

Graph 4 shows a breakdown by received bytes and sent bytes of the Trickle traffic between August 1993 and August 1994. The incoming traffic consists of the commands from the users, the directory updates, and the software obtained for distribution to users. The outgoing traffic is mainly the software requested by the users. Because the software is cached on Trickle's disk, it is usually obtained once, and sent out many times to users.



Graph 4 : Total Trickle Traffic (Mbytes)

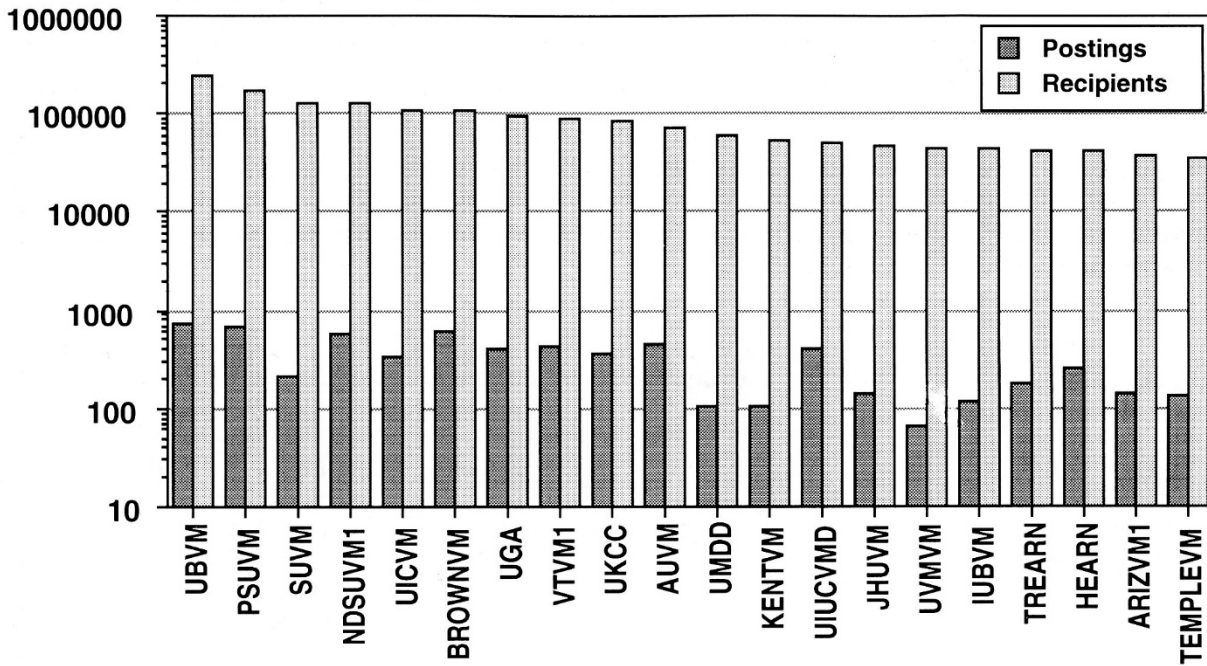
Listserv statistics

LISTMON is an EARN server that automatically maintains a database of information on Revised LISTSERV servers. Users can query this server for information and statistics on the LISTSERV servers.

With a recent addition, it has started polling LISTSERV servers for various statistical values, such as "How many local users were served", "How many discussion list messages were processed", etc. The results are being processed, and posted to EARNSTAT@EARNCC.EARN.NET list monthly, showing how active each server was during that month. The same processing program also allows individual LISTSERV administrators to run the program for their own server, and obtain graphs showing changes and trends on their server's output.

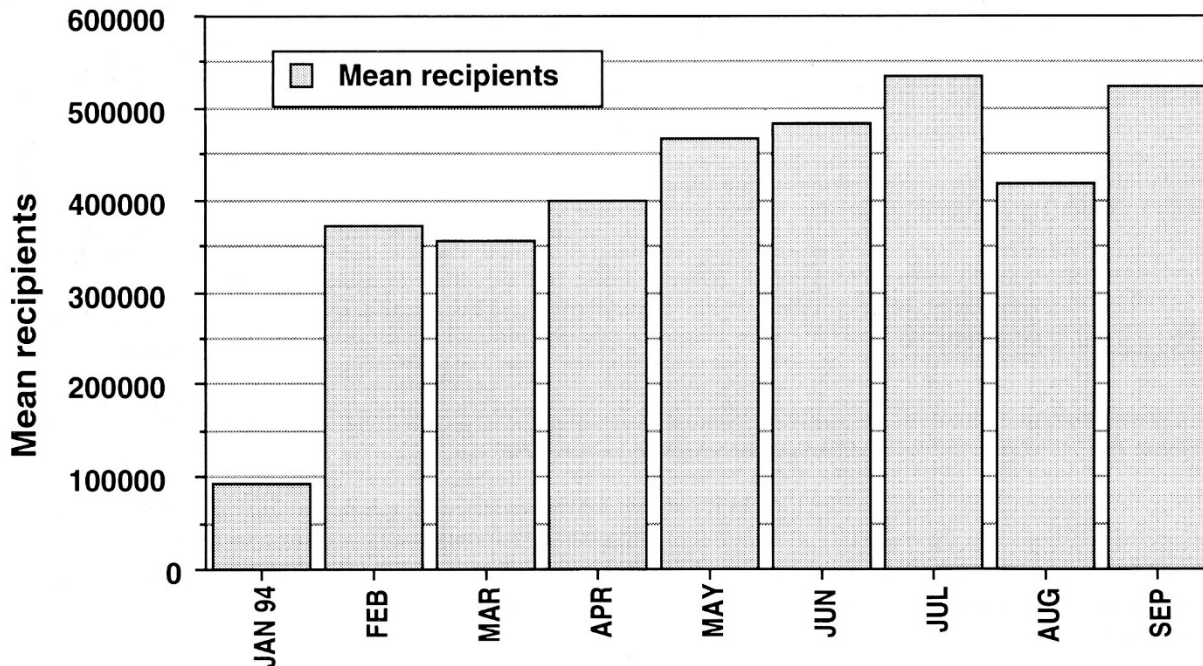
The results were startling: it turns out that the Dutch node HEARN has the busiest server within EARN, delivering more than 60,000 messages per day to its delivery area. For all servers combined, this number passed 1.3 million messages per day, for the relatively "quiet" month of June 1994.

Graph 5 gives an indication of the popularity and efficiency of the LISTSERV service. It shows the daily average number of messages processed by LISTSERV and the number of recipients served for the top 20 LISTSERV servers worldwide during the month of August 1994.



Graph 5: August daily average number of postings and recipients for the top 20 LISTSERV in the world.

Graph 6 shows the monthly average number of LISTSERV mail recipients for the period January - September, 1994, for all the servers currently polled by the monitor (around 170).



Graph 6: Monthly average number of recipients for all the servers polled, between January and September 1994.

Financial Data

The next two tables reflect the official documents by EARN's auditors KPMG Audit at Neuilly-sur-Seine, France

Balance Sheet December 31, 1993 (Expressed in French Francs)			
	December 31, 1993	December 31, 1992	
Fixed assets	371,604	328,060	
Current assets			
Debtors	2,350,801	2,082,360	
Marketable securities	3,215,953	4,580,999	
Cash at bank and in hand	530,296	1,461,475	
Prepaid expenses	190,271	14,538	
	<u>6,287,321</u>	<u>8,139,372</u>	
Current liabilities			
Accrued liabilities	595,603	1,530,127	
Prepaid income	391,789	543,759	
	<u>987,392</u>	<u>2,073,886</u>	
Net current assets	5,299,929	6,065,486	
	<u>5,671,533</u>	<u>6,393,546</u>	
Funds			
Contingency fund at January 1st	6,393,546	5,705,057	
Income less expenditure	(722,013)	688,489	
Contingency fund at December 31st	<u>5,671,533</u>	<u>6,393,546</u>	

Income and Expenditure Account
December 31, 1993
(Expressed in thousands French Francs)

	1993 (actual)	1992 (actual)
Income		
- Countries' contributions	4,197	5,040
- Other income	867	1,292
Total	5,064	6,332
Budgeted expenditures		
- President's Office	219	268
- EARN Office	1,179	1,150
- EARN Staff	2,048	1,949
- Other expenses	635	621
- Intercontinental lines	424	573
- Other development expenses	414	772
- Less expenditure transferred to fixed assets	(22)	(273)
Total	4,897	5,060
Income less budgeted expenditures	167	1,272
Unbudgeted expenditures	889	584
(Unbudgeted expenditures include depreciation of equipment and other expenses balanced by items under <i>other income</i>)		
Income less expenditures	(722)	688

In the next table, we compare the 1994 budget with the 1992 and 1993 accounts, sorted into the same categories as used in the EARN budget.

Accounts 1992 and 1993 and budget for 1994 (KECU)						
	Accounts 92		Accounts 93		Budget 94	
	Expenses	Income	Expenses	Income	Expenses	Income
President	39		33		42	
EARN Office	165		178		108	
EARN Staff	280		308		287	
Other expenses	89		96		169	
Connectivity (including EBONE)	83		64		0	
Development	111		63		55	
Less fixed assets	(39)		(3)			
Total budgeted expenses	728		739		661	
Unbudgeted expenditures	84		133			
Net surplus	98		(109)			
Countries contributions		724		633		536
Contribution from contingency fund		0		0		55
Other income		186		130		70
Total	910	910	763	763	661	661

Treasurer's Report

During 1993 EARN has spent 94 KECU more than the amount that had been planned in 1992. The actual expenditures have been 875 KECU, against 779 planned in the initial budget.

Income has been greater than what had been planned in the budget: 763 KECU against 688. The contribution from the contingency fund has thus been 109 KECU against 91 planned in the initial budget.

During 1993 EARN assets (including fixed assets such as computers and furniture) have decreased from 6,393,546 french francs on January 1st (965 KECU) to 5,671,533 french francs on December 31st (856 KECU). This is due to both depreciation of fixed assets and to use of reserves as decided by the Board.

Increased expenditures were mostly due to extra expenses that were not in the initial budget, but were approved during the year. These lately budgeted items include expenses for the CNRE magazine, the contract with L-Soft for the free distribution to EARN members of LISTSERV and L-MAIL and expenses for the relocation of the EARN Office. In addition, EARN had expenses for Ebone staff but these expenses were refunded by Ebone as extra income.

EARN has again had problems with late payments with 53% of the contributions outstanding at the end of the year. This is better than 1991 (64% outstanding) but worse than 1992 (40% outstanding). For 1994 the Executive has decided to offer a 5% discount to contributions received before January 31st. At the time of writing, it appears that this offer has not changed the bad habits of the usual late contributors.

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