Réseaux IP Européens

Network Coordination Centre

RIPE ncc

QUARTERLY REPORT

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RIPE Network Coordination Centre

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Introduction

The IP world in Europe is a concatenation of a large number of individual networks. These networks are extremely diverse and consist of regional networks, national networks, international networks, research networks, commercial networks and a number of commercial organisations.

RIPE is the organisation where these networks meet to discuss issues of common interest. RIPE has been functioning since 1989. Currently over 60 networking organisations participate in the work of RIPE. The result of the RIPE coordination effort is that the individual end user is presented on his desktop with a uniform IP service all over Europe, irrespective of the network his workstation is attached to.

The RIPE Network Coordination Centre (NCC) formally began in April 1992. It exists both as a support centre and a service centre. It functions to coordinate and support all RIPE activities which cannot effectively be performed by volunteers from the participating organisations. Additionally it functions to provide services to network operators throughout Europe. The activities of the RIPE NCC are defined in the "RIPE NCC Activity Plan" (document ripe-w07).

This is the first quarterly report from the RIPE NCC covering the second quarter of 1992.Comments and suggestions regarding both the content and the format are welcomed.

Management Summary

A good and quick start

The RIPE NCC formally started operations in April 1992 with the NCC manager. He was joined in May by the network engineer and the network administrator. During March, even before the official start of activities, the office space was organised and the computing equipment was installed. This enabled the NCC to provide core services from day one.

The first two months of operation with the full staff complement were used to quickly establish a comprehensive set of services, as specified in the NCC activity plan. Some of these were a continuation of services that hitherto had been provided elsewhere. An orderly and timely transition to the NCC of these services was carried out with help of all those who had been involved with their provision. Recently, the NCC has established a number of new services. Detailed information about all the activities can be found in "Activities" on page 4.

As expected general set-up and training activities also consumed resources during this phase. Since these activities are operational overheads, they will not be detailed below.

Priorities

During this start-up phase, priority was given to establishing those activities which can be both quickly initiated and produce results. Activities needing a longer set-up time and/or those which need considerable guidance from RIPE have been postponed until a basic service level is achieved and recognised by the community.

Important Topics

The section on "Important Topics" on page 22 highlights issues around future charging models for NCC services and the mapping activity.

Outlook

The NCC will use the next three months to consolidate the current achievements and to stimulate consensus building in RIPE about priorities for the longer term activities. These will then be started in the third quarter of NCC operations following the next RIPE meeting.

Activities

A key focus for the RIPE NCC is to act as a central point for both information gathering and dissemination. Furthermore, it is vital that the information held by the NCC is easily accessible and easy to use. To this end, the NCC has in it's first quarter of operation, a number of successes to report.

General Set Up

The NCC is located in offices rented at NIKHEF in Amsterdam.

The NCC computing equipment was delivered and set up by late March. This enabled the NCC to provide some services from day one and to use the computers to support the RIPE meeting in April.

The NCC operates 5 SUN ELC machines on a private Ethernet. Two machines are located in the NIKHEF computer room. These machines function as the public server host and the NCC file server respectively. The remaining three machines are used as personal workstations for NCC staff and are located in the NCC office. Both IP and X.25 network connections were installed immediately after delivery of the hardware. Reliability of the computing equipment has been excellent. The public server has been available without interruption for the last 82 days of the quarter.

DNS Coordination

The NCC has taken over the RIPE DNS hostcount which previously had been produced on a volunteer basis. All hosts listed in the RIPE part of the DNS (the Internet Directory) are counted. This gives a good indication of the size of the RIPE community in terms of machines.The hostcount is currently gathered once per month and distributed via the RIPE mailing list.

In addition the DNS output which is used to produce the hostcount, is archived in the RIPE document store. This output also contains error messages, which can be retrieved from the document store by DNS managers, to check their part of the DNS tree for errors.

Also archived in the document store, is a graph showing the growth of the IP network in Europe, in terms of DNS registered hosts. This graph shows an exponential growth. The graph can also be found on page 43.

The following table gives a historical view of the number of hosts counted:

1990	Oct	26141
	Nov	33665
	Dec	29226
1991	Jan	43799
	Feb	44000
	Mar	44506
	Apr	46948
	May	52000
	Jun	63267
	Jul	67000
	Aug	73069
	Sep	92834
	Oct	104828
	Nov	129652
	Dec	133000
1992	Jan	141308
	Feb	161431
	Mar	167931
	Apr	170000
	May	182528
	Jun	196758

RIPE Network Management Database

Smooth cutover

After being operated by EUnet for more than two years the RIPE database was moved to the NCC server machine by late March. EUnet personnel have been extremely helpful in achieving a totally seamless cutover which was invisible for the database users. The table below shows the development of the RIPE database in terms of objects registered since the first formal report to RIPE in November 1990. A graphical representation of this table can be found on page 41.

Month	Nets	Persons	Domains
Nov 90	643	670	0
Jun 91	1270	1053	845
Jan 92	2728	1792	1254
Apr 92	3365	2242	1360
Jun 92	3797	2736	1422

This shows that the increase in the number of domain objects is relatively low. The main reason for this is that there is no direct incentive to register in the RIPE database in addition to the DNS. The rationale for the domain object in the RIPE database was that certain information like an organisation's full name and contact person's phone number could not be included in the DNS. Since RFC1183 specifies how to code contact information for domains in the DNS, the RIPE DNS working group should review the usefulness of this object.

Better updates and improved consistency

After the move, users now enjoy better response times on WHOIS queries and more frequent update runs. The current frequency of update run is once per working day. This ensures that users perceive the database update process as predictable. During the reporting period the NCC has processed 12549 object updates, an average of 139 per day. The number of updates received per month varies widely with peaks usually occurring just before RIPE meetings.

The updates consist of additions and changes as well as so called "NOOPs". NOOPs are updates received which do not differ from the information already recorded in the database. The NCC accepts such requests because it makes bulk updates from secondary NICs easier: secondary NICs can just send in their whole database without having to select just the records which changed since the last bulk update was sent to the NCC. The NCC started to keep statistics of the different kinds of update in June:

Updated	286	16%
Added	483	27%
NOOP	1005	57%

Tools to check the consistency of the database have been improved. The availability of full time staff at the NCC has made it possible to apply these tools more frequently and to actively follow up any inconsistencies detected. Previously this was outside the resources of the volunteer staff who maintained the database.

Network in DNS registered in RIPE database.

This table shows per country, the percentage of the IP networks found in the DNS that also feature in the RIPE database. For network management purposes it is desirable that all networks found in the DNS are registered in the RIPE database. With the help of local NICs/NOCs the RIPE NCC will take actions to increase coverage where needed. An explanation of domain names and other categories used in tables can be found in “Appendix D” on page 32. A graphical representation of this table can be found on page 42

Country	Nets in DNS	Nets in DB	Percentage
BE	8	8	100
CS	6	6	100
HU	3	3	100
TN	1	1	100
YU	3	3	100
FR	286	273	95
CH	87	81	93
IE	11	10	91
PL	10	9	90
ES	18	16	89
IT	74	61	82
NL	94	76	81
DE	287	231	80
PT	30	24	80
IL	21	15	71
UK	171	116	68
GR	12	8	67
AT	47	30	64
NO	41	24	59
IS	2	1	50
LU	2	1	50
SE	150	74	49
DK	20	8	40
FI	350	24	7

WHOIS client under development

A RIPE version of the WHOIS client program for Unix is under development at the NCC. This client program will make it possible to access the RIPE database as default rather than the DDN NIC database. It will also provide a more convenient interface to the various options the RIPE database provides while maintaining backwards compatibility with earlier versions of Unix WHOIS clients. This client program will also allow for the selection of the "nearest" secondary copy of the RIPE database. The WHOIS client will be available before the next RIPE meeting.

Database Software development

The long needed revision of the database software is still in progress. The software has been restructured considerably in order to improve consistency.The new objects agreed at the last RIPE meeting still have to be integrated as well as additional instrumentation which is needed for secondary database servers. This work is expected to be finished in July after which a beta test period of about one month will precede a general release. At the same time the tools for bulk database updates from local NICs will be revised. Valuable input has been received from the DE-NIC.

Worldwide Database Coordination

Discussions with the DDN and MERIT NICs about coordination and alignment of the various databases have been intensified. Interchange formats and procedures to resolve inconsistencies are currently under discussion.

New ways to access the database

An additional interface to query the database has been provided in the form of a WAIS server. This makes it possible to search the database based on any text string and not only on key strings as is the case with the standard WHOIS interface. This enables questions like "Who is doing internetworking in Dresden?" to be answered quickly. For more details about the WAIS server see the section on the “Document Store” on page 8. Indirectly the WAIS server also provides access to the database via the GOPHER interface. Both of these interfaces can be accessed via the IIS. For more details, please refer to the section on the “Interactive Information Server” on page 12 and “Appendix C” on page 29.

Document Store

One of the coordinating activities of the RIPE NCC is to act as a focal point for the store of information, which is of interest and useful to network service providers, NICs, NOCs alike. The documents stored relate to a wide variety of networking topics. For example, information can be obtained about the activities EBONE, the Internet Engineering Task Force (IETF) and the Internet Engineering Steering Group (IESG), RARE, and not least, documents relating to RIPE itself. In addition the document store contains information relating to Internet drafts, RFC’s and FYI’s.

In total the document store contains approximately 2000 documents. By volume, it accounts for over 120 Mbytes. A breakdown of the composition of the document store is shown below:

Area	Files	KBytes
rfc	542	39055
internet-drafts	366	25306
tools	76	18835
nsfnet	112	17055
ripe	261	14304
ietf	564	6861
rare	64	5792
iesg	32	338
ebone	6	112
internet-society	13	75

A graphical representation of this table can be found on page 37. Over 12% of these documents (by volume and by number of documents) are RIPE documents.

Accessing the Document Store

The NCC document store can be accessed through a variety of methods. It can be accessed via anonymous ftp to `ftp.ripe.net` and by using GOPHER and WAIS clients to *`gopher.ripe.net`* or *`wais.ripe.net`* respectively. Additionally the NCC document store can be accessed through the NCC Interactive Information Server. A summary on how to use the Interactive Information Server are described in detail in “Appendix C” on page 29.

FTP Usage Statistics

The most popular archive sections of the RIPE document store for the second quarter of 1992, are tabulated below. This displays the top 15 most popular sections which were accessed using ftp. The most popular section is the ripe database, with approximately 210 Mbytes transferred. The second and third most popular sections were RFC's and RIPE documents respectively:

Archive Section	Files Sent	Bytes Sent	%of Files Sent	%of Bytes Sent
ripe/dbase	485	212886712	14.40	51.63
rfc	1041	77700761	30.91	18.84
ripe/docs	484	26847213	14.37	6.51
nsf	123	14441267	3.65	3.50
tools/www	63	13504120	1.87	3.27
ripe/hostcount	233	12141912	6.92	2.94
ripe/maps	266	11776004	7.90	2.86
tools/wais	54	10670219	1.60	2.59
internet-drafts	96	8479672	2.85	2.06
rare/monograph	8	4573052	0.24	1.11
ripe/info	109	4058826	3.24	0.98
tools/gopher	51	3836890	1.51	0.93
nsf/recompete	8	3220242	0.24	0.78
ebone	92	1900608	2.73	0.46
rare/RTR	3	1575247	0.09	0.38

A graphical representation of this table can be found on page 40.

The number of Mbytes transferred using ftp per top level domain is shown below:

Domain Name	Files Sent	Bytes Sent	%of Files Sent	%of Bytes Sent
at	43	2384595	1.28	0.58
au	1	609476	0.03	0.15
be	21	2937684	0.62	0.71
ca	10	1454072	0.30	0.35
ch	742	92328758	22.03	22.39
cs	4	105822	0.12	0.03
de	309	36983427	9.17	8.97
dk	9	52658	0.27	0.01
es	23	4685192	0.68	1.14
fi	148	41946375	4.39	10.17
fr	262	18611521	7.78	4.51
gr	3	42465	0.09	0.01
hu	35	457700	1.04	0.11
ie	82	4804181	2.43	1.17
il	7	1868925	0.21	0.45
it	63	8635249	1.87	2.09
jp	10	354711	0.30	0.09
lu	4	13992	0.12	0.00
nl	313	72864029	9.29	17.67
no	21	2707938	0.62	0.66
pl	98	5169234	2.91	1.25
pt	43	1189547	1.28	0.29
se	37	3461152	1.10	0.84
tw	2	158817	0.06	0.04
uk	277	18843629	8.22	4.57
yu	3	56994	0.09	0.01
com	21	2672085	0.62	0.65
edu	188	23452925	5.58	5.69
gov	3	201605	0.09	0.05
mil	4	1486335	0.12	0.36
net	141	30667990	4.19	7.44
org	10	322253	0.30	0.08
unresolved	431	30833465	12.80	7.48

A graphical representation of this table can be found on page 39. The total number of Mbytes transferred for the quarter is 412. The unresolved category refers to where there is no match found between the IP address and the Domain Name. The total number of connections using ftp per top level domain is shown page 38.

Interactive Information Server

In accordance with its role as disseminator of information, the NCC has developed an Interactive Information Server (IIS). The goal of the IIS is to enable users with minimal hardware and/or software support to access information stored by the NCC. At the same time it caters for those occasional users who do not choose to run or learn the local WAIS, GOPHER etc. clients. The IIS is also the most convenient method to access the RIPE document store from networks which are not IP based. It is possible to access the information in the document store using both `telnet` and `pad` connections. In addition the server provides an interface to a number of clients enabling a wide range of information to be accessed in a number of different ways. Currently these comprise WAIS, Gopher and WHOIS. Details on how to use the IIS can be found in “Appendix C” on page 29.

General Service Usage Statistics

Statistics for the use of the various NCC services were collected for the second quarter of 1992. The table below shows the total number of connections made for each service (Whois, IIS, Wais, Ftp and Gopher) contacted either directly from a user client or from the NCC Interactive Information Service. The breakdown is given as total number of connections per month:

Service	Apr	May	Jun
Whois	3014	5093	4520
IIS	230	530	602
Wais	14	159	1005
FTP	201	436	770
Gopher	0	89	577

The graph on page 34 is a graphical representation of this table. Due to technical problems GOPHER logging has commenced in mid May.

The number of connections to the various servers at the NCC broken down by the source of the request is shown in the table below. Graphical representations of the FTP and IIS usage can be found on pages 38 and 36 respectively.

Source	Whois	IIS	Wais	Ftp	Total
IIS	1654	0	580	0	2234
IXI	2	73	0	0	75
LOCAL	460	208	68	43	779
NCC-X25	17	50	0	0	67
PSPDN	0	9	0	0	9
UNKNOWN	259	160	16	99	534
at	105	47	2	37	191
au	6	16	8	1	31
be	19	15	6	18	58
ca	19	8	3	8	38
ch	157	34	32	141	364
cl	0	23	0	0	23
com	33	36	294	38	401
cs	34	1	0	4	39
de	3053	79	24	146	3302
dk	77	22	0	10	109
edu	1651	81	38	94	1864
es	65	43	0	26	134
fi	66	13	0	50	129
fr	1061	39	13	84	1197
gov	69	8	10	4	91
gr	80	6	0	3	89
hk	0	0	0	1	1
hu	114	66	0	15	195
ie	148	27	0	65	240
il	16	19	0	10	45
it	259	12	0	55	326
jp	13	14	0	5	32
lu	4	0	0	3	7
mil	3	18	26	4	51
net	1253	39	0	94	1386
nl	940	93	48	247	1328
no	43	7	3	6	59
nz	3	10	0	6	19

Source	Whois	IIS	Wais	Ftp	Total
org	82	0	1	3	86
pl	13	0	0	15	28
pt	466	12	0	22	500
se	237	18	0	18	273
tw	0	0	0	2	2
uk	141	54	6	28	229
us	5	0	0	1	6
yu	0	2	0	1	3
Total	12627	1362	1178	1407	16574

In total there were 1362 connections to the Interactive Information Server, which is queried, on average, 22 times per working day.

Information Leaflets

To promote an awareness of the RIPE NCC, two information leaflets have been prepared, titled 'Network Management Database' and 'Interactive Information Service' respectively. Both leaflets are of a general nature but aim to provide the prospective user with understanding of the nature of information stored by the NCC, details on how to access the information and guidelines on basic navigation within and around it.

Seven hundred hard copies were printed initially. These were distributed by NCC staff at a number of recent international conferences and meetings e.g. JENC '92, INET'92, CCIRN and IEPG.

There has been a favourable response and considerable interest expressed in the leaflets: JANET recently asked for 1000 copies of each leaflet.Unfortunately demand has now outstripped supply and there are none left! However the original leaflets are in need of revision. Since the initial drafting and printing, the NCC has added new documents to the document store. Additional information leaflets describing the services and facilities offered by the NCC are also planned for the near future.

Copies of the leaflets can be obtained from the RIPE Document Store (see the section titled "Document Store" on page 8 for details on various methods of access). The leaflets are held in postscript format in the subdirectory ripe/info and titled `leaflet-info.ps` and `leaflet-dbase.ps`.

Presentations

It is a priority of the NCC to inform as many users as possible, as clearly as possible, what the role of the NCC is in relation to the multitude of networking organisations. Clearly the larger the audience, the easier this task is. To this end the NCC will give presentations about its activities wherever appropriate and possible. It is stressed that all those organisations wishing to convey the work of the RIPE NCC to others are invited to contact the NCC with a request for a presentation.

JENC ’92 - Innsbruck

The RIPE NCC held a "birds of a feather" session for the delegates of the JENC '92 conference in May held in Innsbruck. The RIPE Chairman, Rob Blokzijl presented an overview of the last RIPE meeting which took place in April and the role of the RIPE NCC. Daniel Karrenberg, the manager of the RIPE NCC, followed with a status report on the first month activities of the NCC. Both presentations were well received and clarified the role of the NCC, its’ relationship to RIPE, and its’ current status.

EUnet Backbone Meeting

On Sunday 28th June, Daniel Karrenberg gave a short presentation on the activities of the RIPE NCC to the EUnet Backbone meeting delegates.

DIGI Meeting, Germany

Similar presentations are planned for the meeting of the German Internet Interest Group (DIGI) which is to be held in München on 11-12th November.

RIPE Support Activities

RIPE meetings

RIPE meetings provide a vital forum for both formal and informal information gathering, exchange and debate. In particular it provides an opportunity for the members of the working groups to meet, discuss and progress their work.

From its initiation on April 1st 1992, the RIPE NCC has been chartered to provide support for all RIPE meetings. This included the 12th RIPE meeting, (although not all the NCC staff members were yet formally employed) which took place on April 27th-29th at NIKHEF, Amsterdam where the NCC offices are located.

At the last RIPE meeting, the NCC provided both administrative and technical support for 56 attendees, requiring considerable liaison and co-ordination between (and within) NIKHEF and the RIPE NCC

The NCC was able to offer the following to all attendees:

❍ remote login and e-mail connectivity from a choice of 3 workstations and 15 terminals

- use of telephone and fax service
- use of photocopying facilities
- copies of all papers tabled and late additions available

The NCC welcomes suggestions for support from participants for future RIPE meetings.

Working Groups

The work in RIPE is done by the technical working groups. At present there are 8 such groups active in the following areas:

- Network information services
- Domain Name system
- Routing
- Network monitoring and statistics
- Network maps
- European connectivity
- RIPE database
- Relationship between Academic & Research networks and Commercial networks

The working groups deliver the results of their work in the following ways: via RIPE reports, RIPE recommendations, as tools for common network management practices and as European wide implemented common network policies.

Working Group Mailing Lists

Coordinating and support for the activities of the Working Groups is a key focus for the RIPE NCC. During the first quarter, the NCC has created mailing lists for those working groups that have requested this facility.

Relationship between Academic & Research Networks & Commercial Networks.
Chair: Glenn Kowack. E-mail: `glenn@eu.net`.
Working Group E-mail: `raec-wg@ripe.net`.

Network Information Discovery and User Support.
Chair: Nandor Horvath. E-mail: `horvath@sztaki.hu`
Working Group E-mail: `nidus-wg@ripe.net`

DNS Issues
Chair: Francis Dupont. E-mail: `francis.dupont@inria.fr`
Working Group E-mail: `dns-wg@ripe.net`

Routing Issues
Chair: Jean-Michel Jouanigot. E-mail: `jimi@dxcoms.cern.ch`
Working Group E-mail: `routing-wg@ripe.net`

Network Monitoring and Statistics Gathering
Chair: Bernhard Stockman. E-mail: `boss@sunet.se`

Network Maps
Chair (temporary): Hank Nussbacher. E-mail: `hank@vm.tau.ac.il`
Working Group E-mail: `ripe-map@ripe.net`

European Connectivity
Chair: Milan Sterba. E-mail: `milan.sterba@inria.fr`

RIPE Database
Chair: Wilfried Woeber. E-mail: `woeber@access.can.ac.at`

To subscribe to any working group send a message to:

`[listname]-request@ripe.net`

where [listname] is replaced by the name of one of the working groups specified above.

There also exists a more general mailing list for all those interested in RIPE activities which is at the following e-mail address:

`ripe@ripe.net.`

WG Liaison

The work carried out by the Working Groups is of vital importance to the RIPE activity. To promote the continuity of dialogue between RIPE meetings amongst the working groups, the RIPE NCC staff members have each been appointed as "liaison officers" to foster continuity between the working group chairs and the NCC. The division between the working groups and the NCC staff is as follows:

Daniel Karrenberg

- The Relationship between Academic and Research Networks and Commercial Networks
- RIPE Database
- Network Monitoring and Statistics Gathering

Marten Terpstra

- Routing Issues
- DNS Issues
- Network Maps

Anne Lord

- Network Information Discovery and User Support
- European Connectivity

The RIPE NCC offers support to all the working group chairpersons in carrying out their respective tasks. Specifically the NCC can offer assistance with editing and formatting documents, directing enquiries to the relevant working groups and assistance with keeping track of the minuted actions. More specifically in this last respect a more formal method of support is currently being drafted.

EBONE Support

The RIPE NCC has provided a high level of technical support for EBONE activities. The NCC is represented in the EBONE Action Team (EAT), as well as in the EBONE Operations Team (EOT). It was decided in an EAT meeting on 4 June 1992 in London, that EBONE will make use of the RIPE database to control routing in EBONE. EBONE will use the extra routing tags as defined in the RIPE document ripe-w09 "Policy Based Routing in RIPE". It was explained in an EOT meeting on 5 June 1992, also held in London, that the routing support defined in this document is sufficient for the control of routing in EBONE.

The EBONE document archive is also shadowed onto the RIPE archive and incorporated into the NCC Interactive Information Service.

The NCC carried out some operational support for EBONE in exceptional situations and also coordinated and cooperated in the re-engineering of the routing arrangements of the Amsterdam EBONE Boundary System and Regional Boundary Systems in Amsterdam. While this is not formally one of the activities of the NCC it was necessary. A formal attitude by the NCC of strict non-involvement in EBONE operational matters would not be appreciated by the community at this stage.

Internet Registry

Delegated Registry

The NCC has obtained blocks of network numbers (class B and C) as well as autonomous system numbers. These numbers will be re-assigned to local NICs as they are requested. If users ask for numbers they will be referred to a suitable NIC if possible. In exceptional cases where this is not possible or acceptable the NCC will assign a number to the user.

The NCC thus functions as a de-facto delegated registry as specified in RFC1174 servicing the RIPE community. So far it has not been possible to obtain formal status as a delegated registry.

The NCC has participated actively in the worldwide discussion about the problems of address space exhaustion and routing table growth in the Internet. The NCC manager has co-authored an Internet draft about IP network number assignment.

The NCC has developed registration procedures which are included in “Appendix A” on page 25. According to well informed sources this has made the NCC the only place in the world assigning network numbers according to a fixed and published policy. These procedures are interim procedures which will be used until the RIPE NCC has delegated registry status as defined per RFC1174.

Address Assignment Plan for Route Aggregation

The registration procedures anticipate that the IETF will recommend implementation of technologies allowing for routing table aggregation. The current procedures recommend to assign network numbers in a way which is compatible with the CIDR proposal. This does not pre-empt any decision on part of RIPE or the IETF because the assigned addresses remain useful without the aggregation techniques. Should the CIDR proposal be adopted, all assigned addresses will allow for aggregation once the technology is deployed. Should another aggregation scheme be recommended by the IETF, the NCC reassignment procedures will be changed to reflect this immediately.

As soon as the IETF position is clear, a survey will be done among RIPE participants in order to assess optimal size and arrangement of address blocks.

Network Numbers

The NCC has received the following network numbers:

Class B networks:	160.44 - 160.63	Apr 1992	15 assigned
Class C blocks:	192.162	Apr 1992	NCC
	192.164 - 192.168	May 1992	all assigned
	193.0 - 193.100	Jun 1992	5 assigned

The following table summarises the class B network assignments during the reporting period:

Networks	assigned via
160.44 - 160.52	DE-NIC
160.53	SWITCH
160.54 -160.58	DE-NIC

The following table shows the number of networks re-assigned out of class C blocks assigned by the RIPE NCC:

Block	Nets Assigned	Block assigned to
192.162	5	RIPE NCC
192.164	37	EUnet Austria
192.165	60	NORDUnet
192.166	51	DE NIC
192.167	1	GARR
192.168	0	EUnet NOC
193.1	0	HEANET
193.2	0	ARNES
193.3	0	DKnet
193.4	0	Iceland
193.5	4	SWITCH

The low absolute numbers for assignments by the NCC during the reporting period are partly caused by the fact that most NICs/NOCs still have block allocations obtained from the US NIC. Furthermore the delegated registry activity has not been widely publicised during the reporting period. The reason for this is that registration procedures had to be developed and are still unstable at this point due to the aggregation issues described above. We did not consider it wise to widely advertise a service operating with interim procedures. We hope that the aggregation issue will be clear enough to develop more stable procedures after the Boston IETF meeting in July.

Intercontinental Coordination

The NCC has taken the initiative in discussions over data consistency and consolidation with regard to the Network Management Database. This was described earlier in the section with the heading “RIPE Network Management Database” on page 5. The NCC has also advised the US National Science Foundation (NSF) on the international aspects of Network Information Services for the NSFnet and the NREN.

In the area of top level domain registrations the NCC has helped to resolve conflicts and to speed up some long-pending registrations. RIPE and the RIPE NCC are now more closely integrated with this process.

The result of these activities is that the RIPE NCC is already widely recognised as the European regional NIC.

Referrals and End-User Enquiries

The number of referral requests and end-user has not been significant during the reporting period.

Important Topics

In this section NCC management will direct attention to topics related to the NCC and those of it's operations which need discussion in the community.

Statistics and charging models

This report consciously presents comprehensive statistics concerning the various services of the RIPE NCC. These numbers give first indications on how NCC services are being used. This is very important both to justify the usefulness of the services and to aid the management of the NCC.

However, considerable caution is advisable interpreting these figures with respect to the current discussion about continued funding for NCC activities. While usage based funding is an inherently positive concept, the measures of usage must be carefully chosen for it to be successful. If the wrong measures are used, unwanted secondary effects may result. For example: if the granularity of the measures is too fine, this results both in micro-management and in waste of resources for accounting. If the measure is proportional to a service with indirect benefits to the community, decreased usage of the service due to cost consciousness may have undesired effects. An example of this is charging for database updates: the net result will be an out of date database which is not useful to the community.

Another important consideration concerning usage based charging is the international and intercontinental environment. Charging for registration and similar functions must be consistent in the global environment.

Based on the currently available numbers alone, NCC management is unable to propose a consistent and workable charging model. Many services are just starting up and time is needed to let usage patterns establish themselves and to develop baseline data. The global environment is changing rapidly and it is difficult to predict where exactly the developments will lead. We expect that it will take considerable time to develop a consistent model that will be acceptable to the RIPE community.

Network Maps

The activity of producing graphical maps of European IP networks has not been progressed in this quarter. The reasons for this are

- to make a comprehensive hierarchy of maps is much more difficult than expected
- public domain tools which were expected to be available are delayed
- additional guidance is needed from RIPE

This activity will need considerable guidance from RIPE on what is needed and what RIPE is willing to "pay" for maps in terms of NCC resources. All input on relevant tools is appreciated.

Acknowledgements

We wish to thank the RARE secretariat for their excellent support during the set-up phase, especially with formal orders for computing equipment and employment related matters.

NIKHEF has been extremely helpful with all office space related matters and installing our computers and network connections. We are especially grateful that Marten Terpstra was given time to help with NCC set-up while he was still a NIKHEF employee.

CWI has also been very helpful by allowing Daniel Karrenberg to spend part of his time on NCC matters while still a CWI employee. Finally we would like to thank the chairman of RIPE, the RIPE working group chairmen and all those who gave valuable feedback to the NCC start-up services.

Appendix A

RIPE NCC Internet Numbers Registration Procedures

July 1992 version 0.5

Abstract

This document describes the procedures for the reassignment of IP network numbers from blocks obtained from the RIPE Network Coordination Centre. It deals with items as providing information for the RIPE and US NIC databases, as well as reassignment of IP addresses in light of the "Supernetting" proposal, as documented in RFC 1338, by Vince Fuller et al.

Introduction

Since May 1st 1992, the RIPE Network Coordination Centre (NCC) is acting as a delegated registry for IP networks numbers to NICs and NOCs in Europe. It is RIPE NCC policy not to give out network numbers to individual organisations, who should refer in turn, to their IP network service provider.

The mission of the RIPE NCC is to give network numbers to the various service providers and NICs. The NICs and NOCs can then reassign the actual IP network numbers to organisations requesting IP network numbers.

Class B Network Number Allocation Procedure

Service providers can request Class B network numbers on a one-by-one basis from the RIPE NCC. Because class B address space is a critical resource, a request for a class B network number must be accompanied by a justification in terms of the requesting organisation's size, current network and expected network growth. The requester should also make clear why they cannot use a block of class C network numbers to achieve their goals. The RIPE NCC will review requests using the same standards as any other Internet Registry, particularly the US NIC.

Class C Allocation Procedures

NICs and NOCs accepting a block of class C numbers agree to adhere to the following procedures:

A) The RIPE NCC will assign complete class C blocks to individual NICs and NOCs. They can be requested from `<hostmaster@ripe.net>.`

B) In order to prevent implementation problems, network numbers ending with 0 or 255 should NOT be reassigned.

C) Full information about reassigned network numbers must be reported back to the RIPE NCC and the US NIC in full RIPE database format (ref ripe-w02). The complete entries should be sent immediately after reassignment to
<ripe-dbm@ripe.net> and *<hostmaster@nic.ddn.mil>*

D) Reassignment of class C network numbers should be done in a manner that facilitates Supernetting (see next section).

E) Requests for network numbers should be reasonable. All NICs and NOCs should prevent stockpiling of network numbers.

F) On first request from the RIPE NCC, the class C network numbers not yet reassigned, must be returned to the RIPE NCC.

Supernetting

NICs and NOCs reassigning IP network numbers are urgently requested to read the Supernetting proposal by Vince Fuller et al. This document can be obtained from the rfc section of the RIPE document store or other RFC drafts servers. It is called rfc1338.txt.

The Supernetting proposal was made to reduce the increase of routing table size in the current Internet. It proposes to create a hierarchy of IP network numbers, which can then be aggregated resulting in less routing table entries in routing equipment. While this proposal has not been formally adopted we expect that something at least along the same principle will be implemented in the near future.

Here is how it works:

If an organisation A needs 8 class C network numbers, the numbers should be given out in such a way that the routing information for each of these 8 networks could appear as one entry with the correct mask in international routers.

More concretely:

Service provider S hands out networks 192.24.8 through 192.24.15 to organisation A. These networks can then appear in routing equipment as a supernet route to 192.24.8 with mask 255.255.248.0. This way 8 class C network numbers appear as one routing table entry.

The guidelines that can be derived from the Supernetting proposal are:

A) Service providers should reserve blocks of class C network numbers from their allocation for each organisations requesting class C network numbers.

B) The size of these blocks should always be a power of 2.

C) The numbers in these blocks should be contiguous.

D) The blocks should start on bit boundaries (ie powers of 2, AND multiples of the block size)

E) The blocks reserved for an organisation should be sufficient for a reasonable expected growth over the next few years.

F) Multi-homed organizations may obtain address space from one of their providers, the RIPE NCC, or the global NIC, as is appropriate to their network configuration. These organisations are strongly encouraged to contact the RIPE NCC for guidance.

If you have any questions concerning this, please do not hesitate to call or mail us at `<ncc@ripe.net>.`

Appendix B

Meetings Attended

The following meetings were attended by staff during the first quarter of the RIPE NCC operations.

Date	Name & Location	Attendee
April 10-12	EAT Meeting Amsterdam, Netherlands	Daniel Karrenberg
April 27-29	12th RIPE Meeting Amsterdam, Netherlands	Daniel Karrenberg Marten Terpstra Anne Lord
May 11-14	JENC'92 Innsbruck, Austria	Daniel Karrenberg Marten Terpstra
May 14	RARE CoA Innsbruck, Austria	Daniel Karrenberg
June 4	EBONE Action Team London, UK	Marten Terpstra
June 5	EBONE Operations Team London, UK	Marten Terpstra
June 10-12	IEPG Tokyo, Japan	Daniel Karrenberg
June 15-18	INET'92 Kobe, Japan	Daniel Karrenberg Marten Terpstra
June 28	EUnet Backbone Leuven, Belgium	Daniel Karrenberg

Appendix C

How to use the Interactive Information Server

To encourage and facilitate use of the Information Server, it has been designed as an interactive service, which aims to be both uncomplicated and easy to use. The basic framework for presenting the information to the user is via a series of hierarchically arranged menus. Additionally, using the IIS the NCC has made it possible to receive copies of the documents by electronic mail.The various interfaces implement this in slightly different ways and these are described in more detail below.

Navigation of the Document Store using the IIS

The basic framework for presenting the information to the user is via a series of hierarchically arranged menus. The menu you see once you are connected is the Main Menu. This is shown below.

```
        RIPE Network Coordination Centre
        Information Services (Pilot) Menu

  1- About RIPE and The RIPE NCC
  2- Browse through the RIPE document store (Gopher)
  3- Keyword Search of the Document Store (Wais)
  4- Search of the RIPE database (whois)



  9- Send Mail to the NCC
  q- quit

Enter Selection:
```

However within this, as the menu above indicates, are a number of different interfaces. Fundamentally, the Interactive Information Service has been designed to cater for two types of user: those with no previous knowledge of the NCC who may wish to "browse" through the document store and those with a specific area of interest, who may wish to "search" the document store.

WAIS access

The RIPE NCC has installed on the Information Server a WAIS interface. This enables the user who has a specific topic of interest, rapid access to documents. If the WAIS keyword search is selected from the main menu you will move immediately to a sub menu which is shown below:

```
SWAIS              Source Selection          Source: 3
 #          Server          Source               Cost
001                       all-documents          free
002                       ripe-database          free
003                       ripe-docs              free
004                       rfc                    free




      Keyword:

      <space> selects, w for keywords, arrows move, <return> searches, q quits,? for help
```

This offers a choice of indices for search, including a global index which searches ‘all documents’. Selecting just this index will search all documents in the RIPE document store. The selection is made by positioning the cursor using the arrow keys and hitting return. You are then prompted to enter your search word. More than one word may be entered provided it is separated by a space. Entering return will activate the search. The results of the search will be displayed in tabular form with the names of the documents, the documents size and the score. The documents appear in descending score order from high to low. A high score represents a higher number of keyword matches in the document. To read the document simply hit return when the cursor bar is positioned over the document title.

A particular feature of the WAIS keyword search access is that you do not have to read the document before asking for it to be mailed to you. By typing 'm' when the cursor bar is over the document of interest, the user will be prompted for an e-mail address and subsequently be returned to the same position within the structure of the document store. Typing 'q' will quit the search and return the user to the main menu. Typing’s’ you will move back one level through the menu, giving the source of the document. Typing ’?’ will give access to help.

GOPHER access

The RIPE NCC also has GOPHER access to the RIPE document store. The information is arranged in a series of hierarchical menus which can be "walked around and browsed through" using a combination of arrow keys to select topics of interest and a 'pager'. If you select item 2 from the main menu you will get the following sub-menu

```
Gopher Client - RIPE Network Coordination Centre
                      ripe

       --->  1. archives/
             2. dbase/
             3. docs/
             4. links/
             5. maps/
             6. ripe-op/

 Press? for help, q to quit, u to go up      Page: 1/1
```

Each sub menu is followed by either a slash or a dot. The former indicates further sub-menus and a dot indicates a document. It is easy to read a document and there are two ways of doing this. Either position the cursor over the document title and hit enter or type in the document number followed by a return. After reading the document the user is prompted as to whether they would like to receive an e-mail copy of the document, and if so, to enter the e-mail address of the recipient.

Accessing the Interactive Information Server

Regardless of protocol the information service is easily reachable from the internet, IXI and Public Data Networks alike. From the Internet you type: *telnet info.ripe.net.* If the message "host unknown" is received, type: *telnet 192.87.45.1*

Using IXI you can connect on most machines by typing: *PAD 020430459300031* and via the Public Data Network by typing: *PAD 0204129004331.* Further details on methods of access can be found on the back page of the 'Interactive Information Service' leaflet.

Appendix D

Domain Table

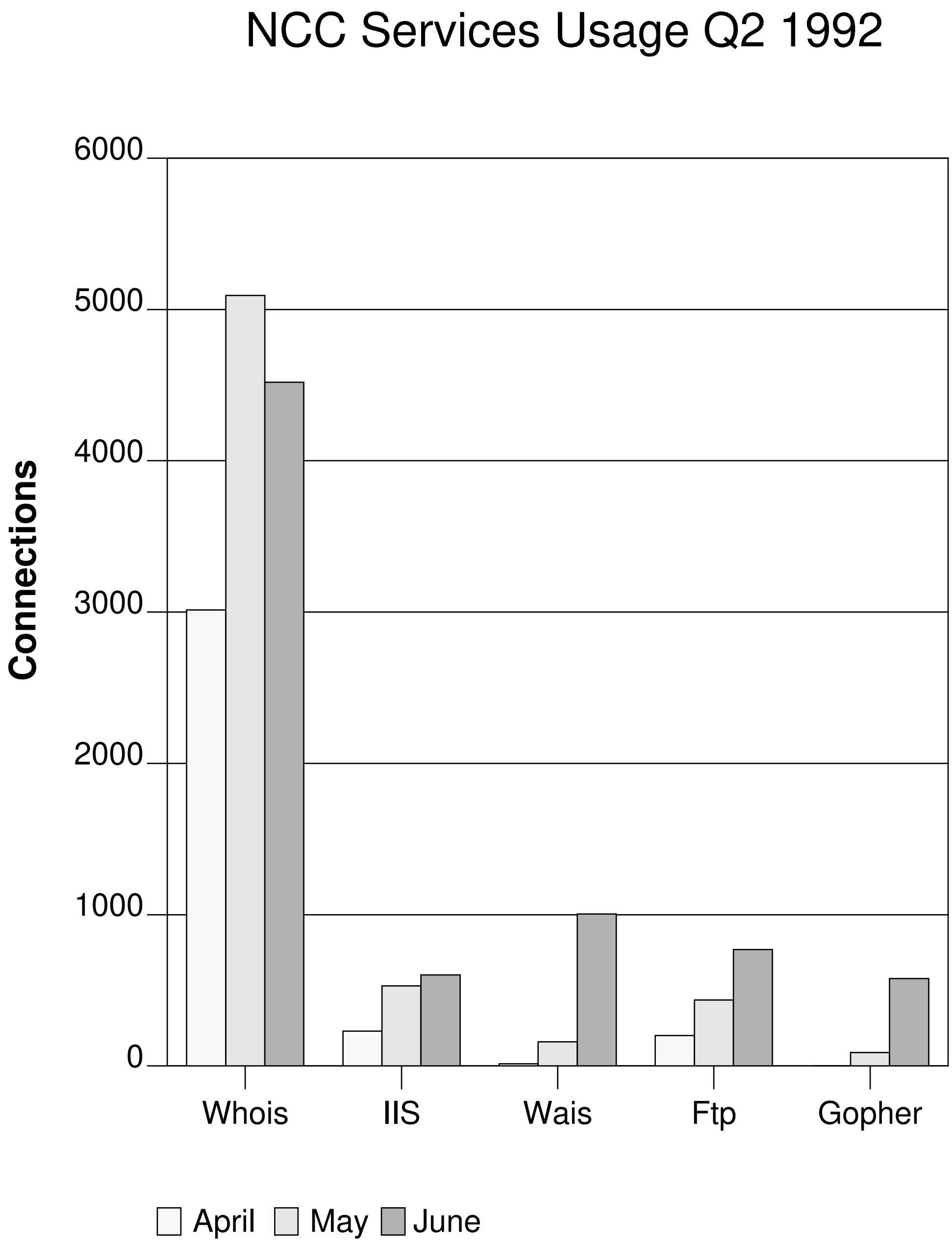
This appendix gives an overview of all top level domains, and other categories mentioned in the tables and graphs.

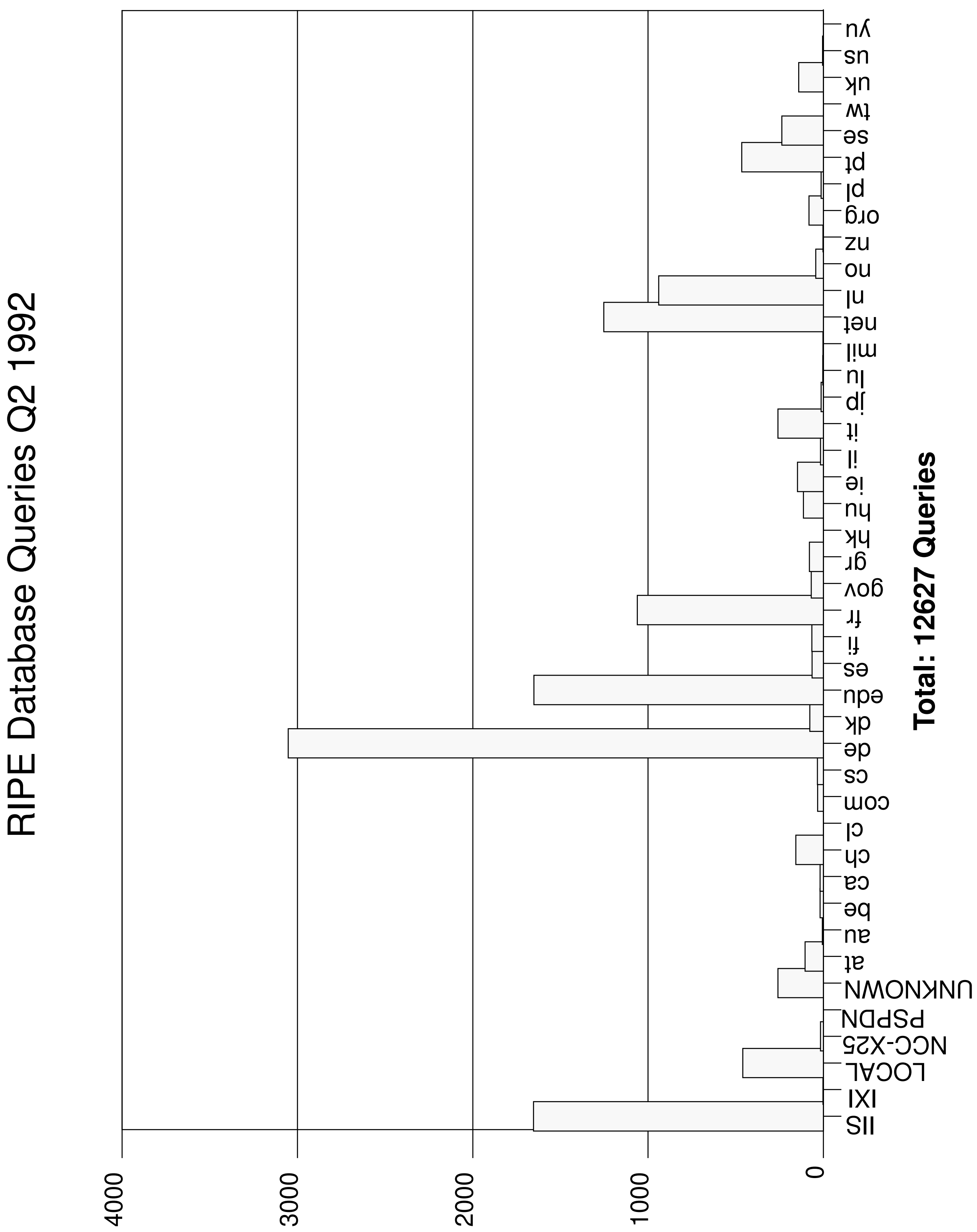
Domain	Specifying
IXI	IXI
IIS	the Interactive Information Server
LOCAL	the NCC itself using IP
NCC-X25	the NCC itself using X.25
PSPDN	the Public Data Network
UNKNOWN UNRESOLVED	no mapping between IP address and domain name could be found
com	commercial organisations (mainly in the US)
edu	educational organisations (mainly in the US)
gov	US government organisations
mil	US military organisations
net	network providers and related organisations
org	organisations (mainly in the US)
al	Albania
at	Austria
be	Belgium
bg	Bulgaria
by	Byelorus
ch	Switzerland
cs	Czechoslovakia
de	Germany
dk	Denmark
dz	Algeria
ee	Estonia
es	Spain

Domain	Specifying
fi	Finland
fr	France
gb	Great-Britain
gr	Greece
hr	Croatia
hu	Hungary
ie	Ireland
is	Iceland
it	Italy
il	Israel
lt	Lithuania
lu	Luxembourg
lv	Latvia
nl	The Netherlands
no	Norway
pl	Poland
pt	Portugal
ro	Romania
se	Sweden
si	Slovenia
su	USSR
tn	Tunesia
ua	Ukraine
uk	United Kingdom
va	Vatican City State
yu	Yugoslavia

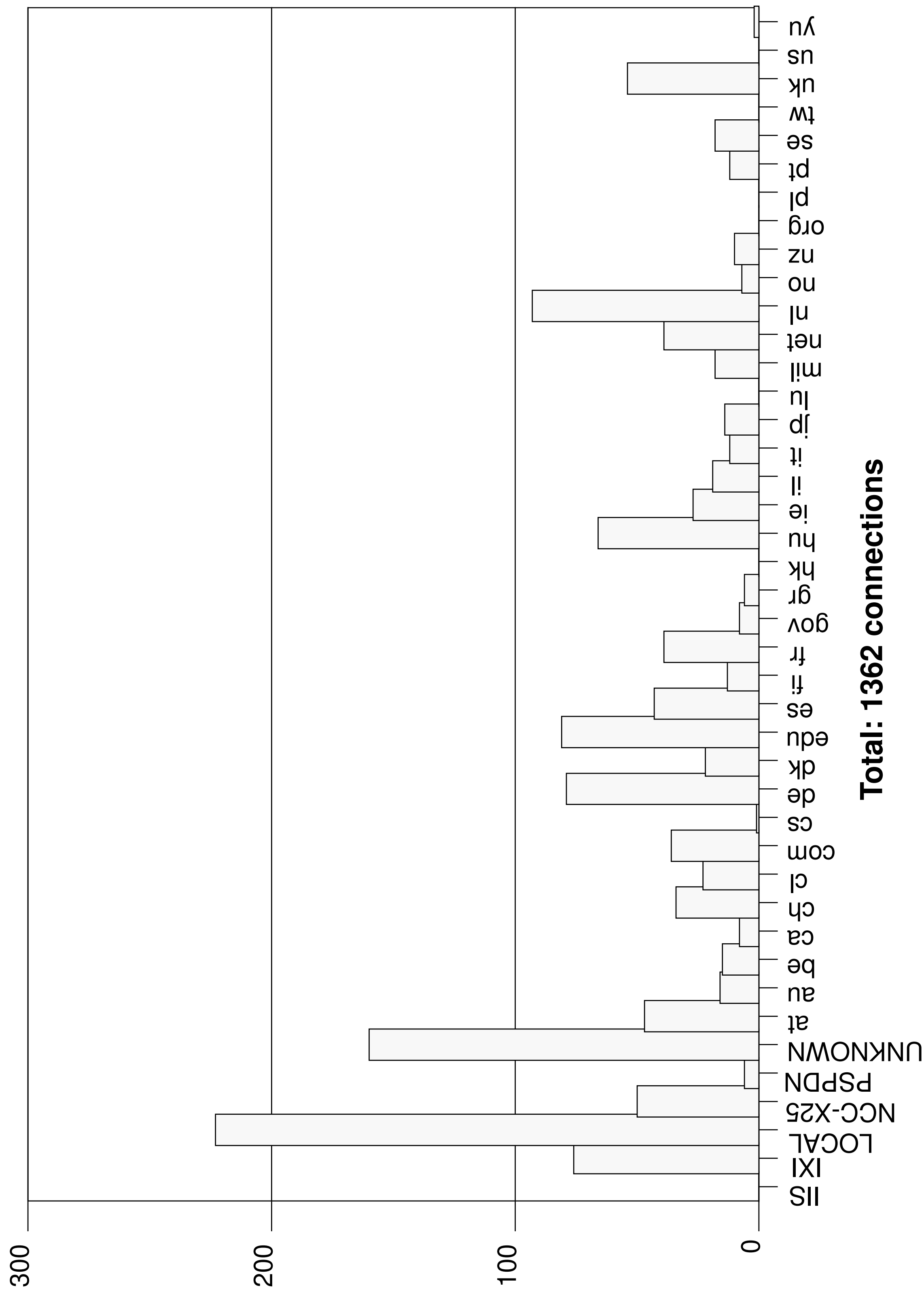
Appendix G

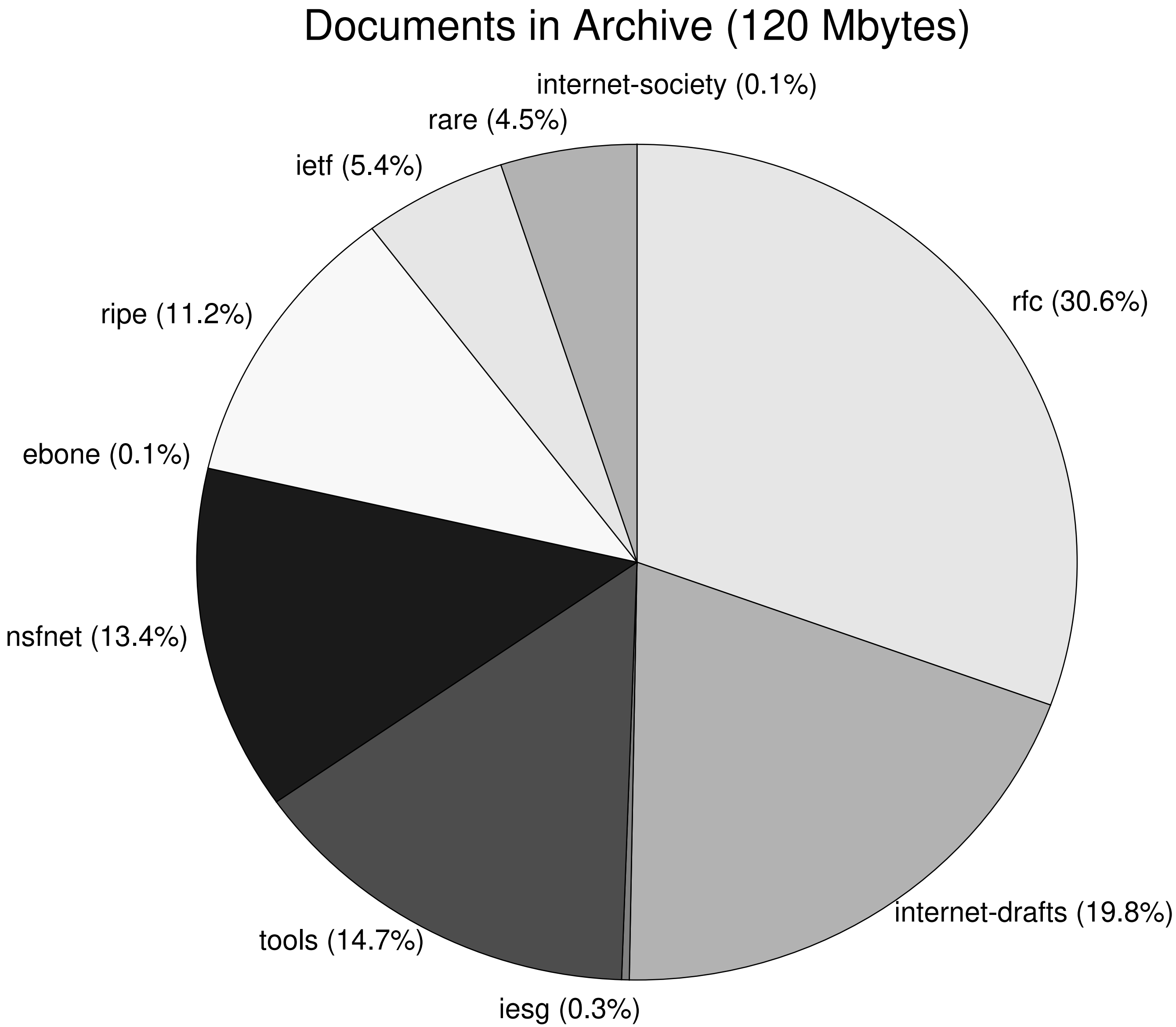
Graphics of Statistical Tables



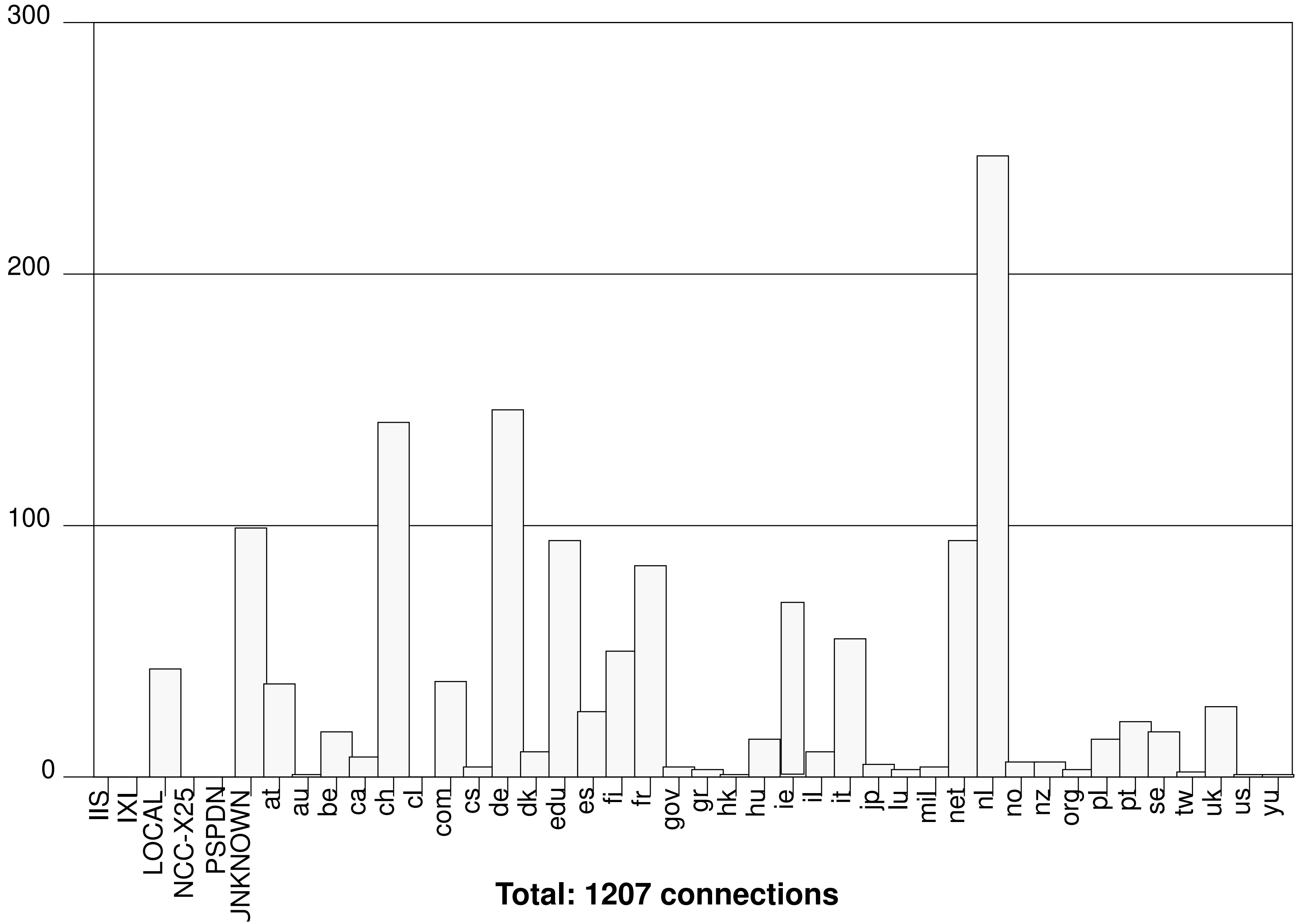

RIPE Database Queries Q2 1992
Total: 12627 Queries
0
1000
2000
3000
4000
IIS
IXI
LOCAL
NCC-X25
PSPDN
UNKNOWN
at
au
be
ca
ch
cl
com
cs
de
dk
edu
es
fi
fr
gov
gr
hk
hu
ie
il
it
jp
lu
mil
net
nl
no
nz
org
pl
pt
se
tw
uk
us
yu

Interactive Information Server Usage Q2 1992



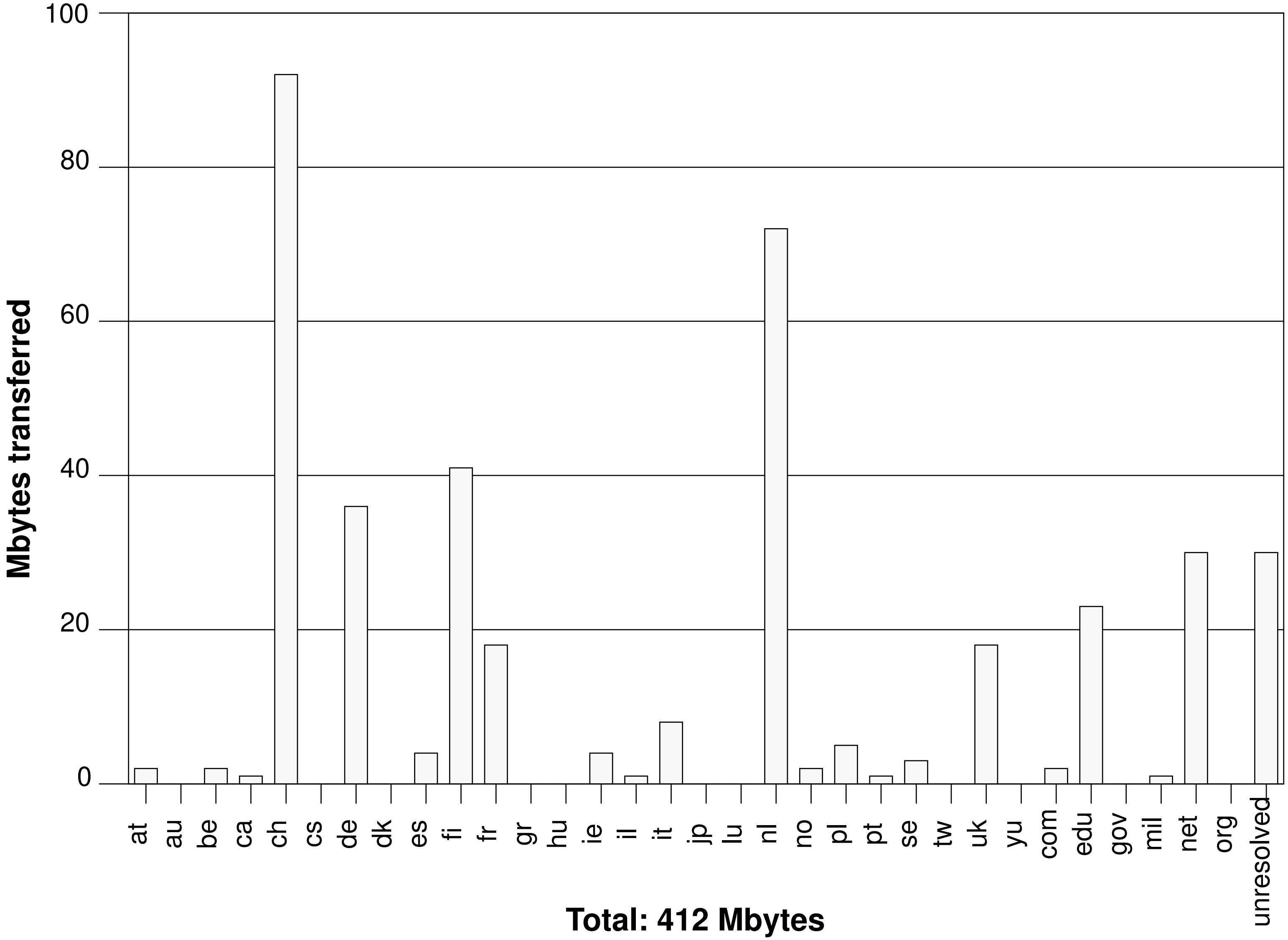

Documents in Archive (120 Mbytes)
internet-society (0.1%)
rare (4.5%)
ietf (5.4%)
ripe (11.2%)
ebone (0.1%)
nsfnet (13.4%)
tools (14.7%)
iesg (0.3%)
internet-drafts (19.8%)
rfc (30.6%)

FTP Connections Q2 1992

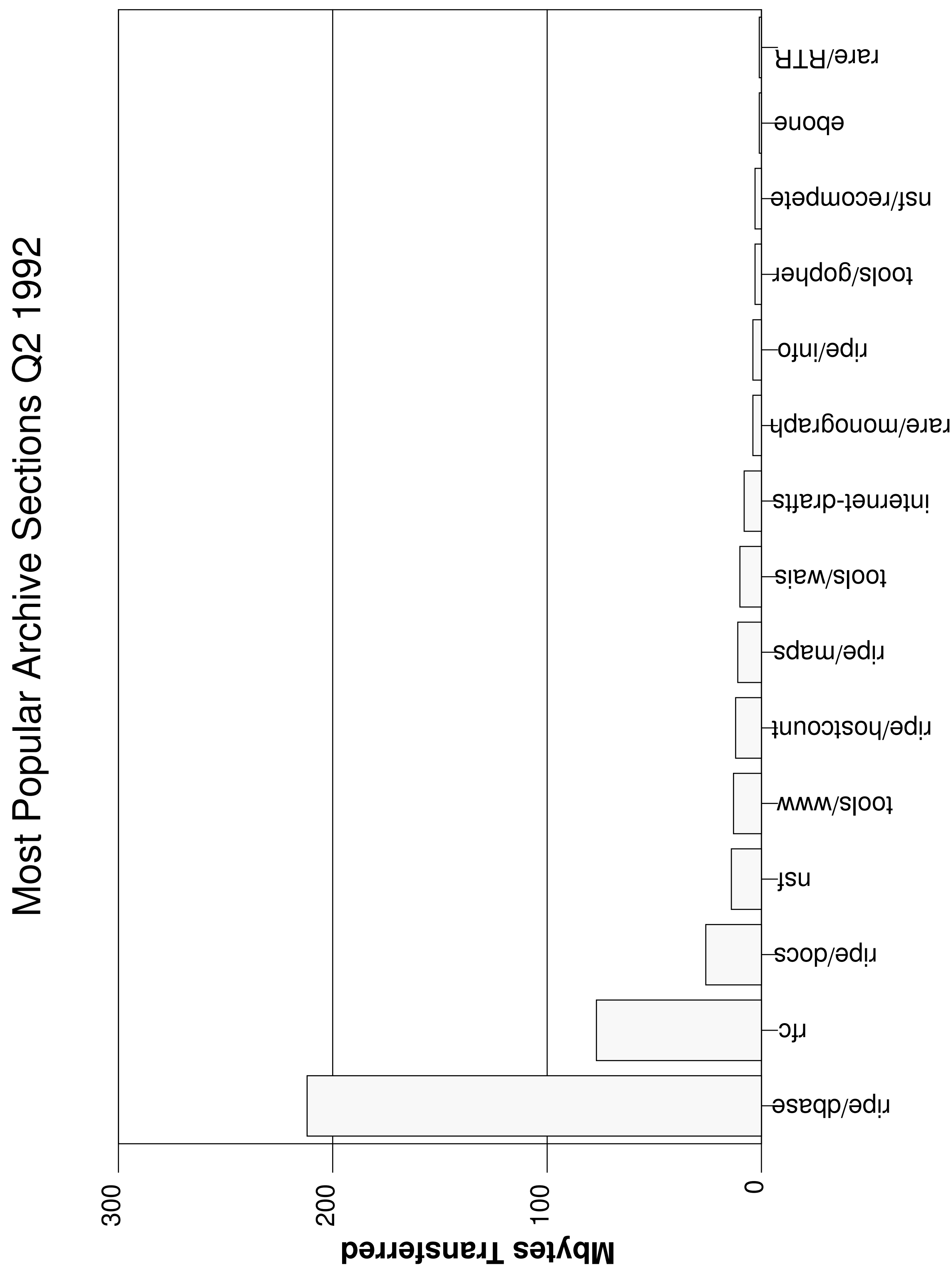


Total: 1207 connections

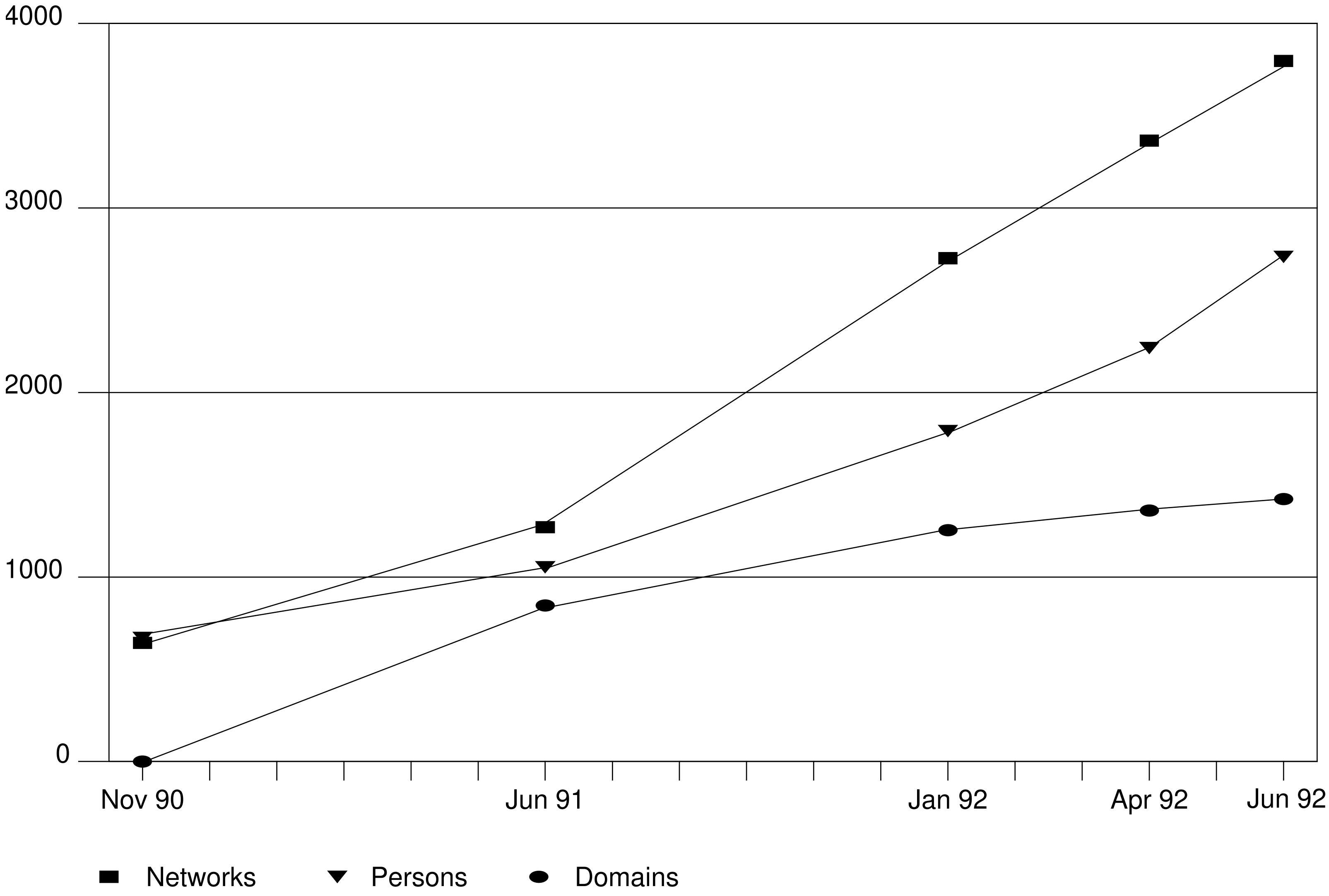
FTP Transfers Q2 1992



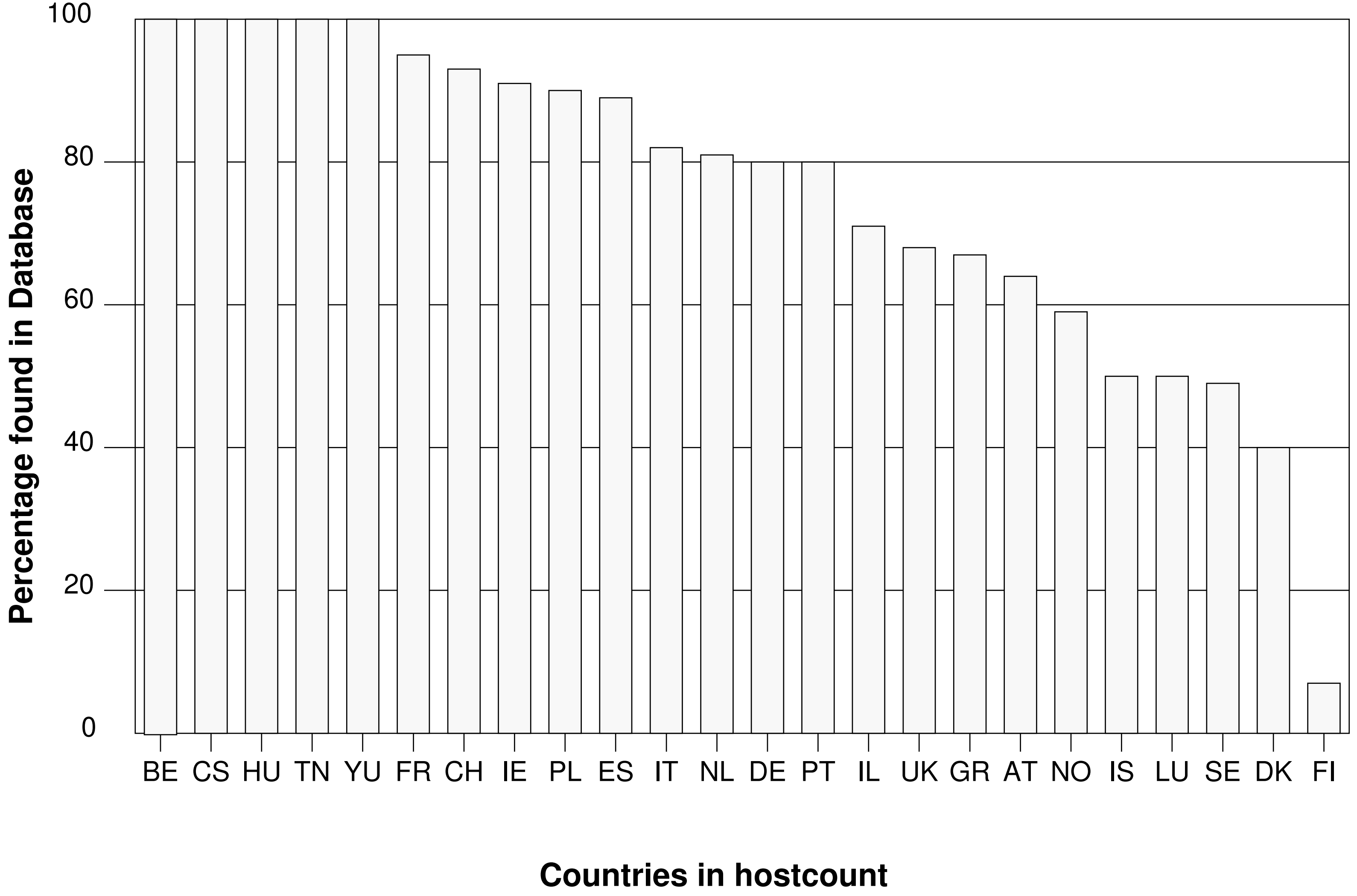
Total: 412 Mbytes


Most Popular Archive Sections Q2 1992
Mbytes Transferred
0
100
200
300
ripe/dbase
rfc
ripe/docs
nsf
tools/www
ripe/hostcount
ripe/maps
tools/wais
internet-drafts
rare/monograph
ripe/info
tools/gopher
nsf/recompete
ebone
rare/RTR

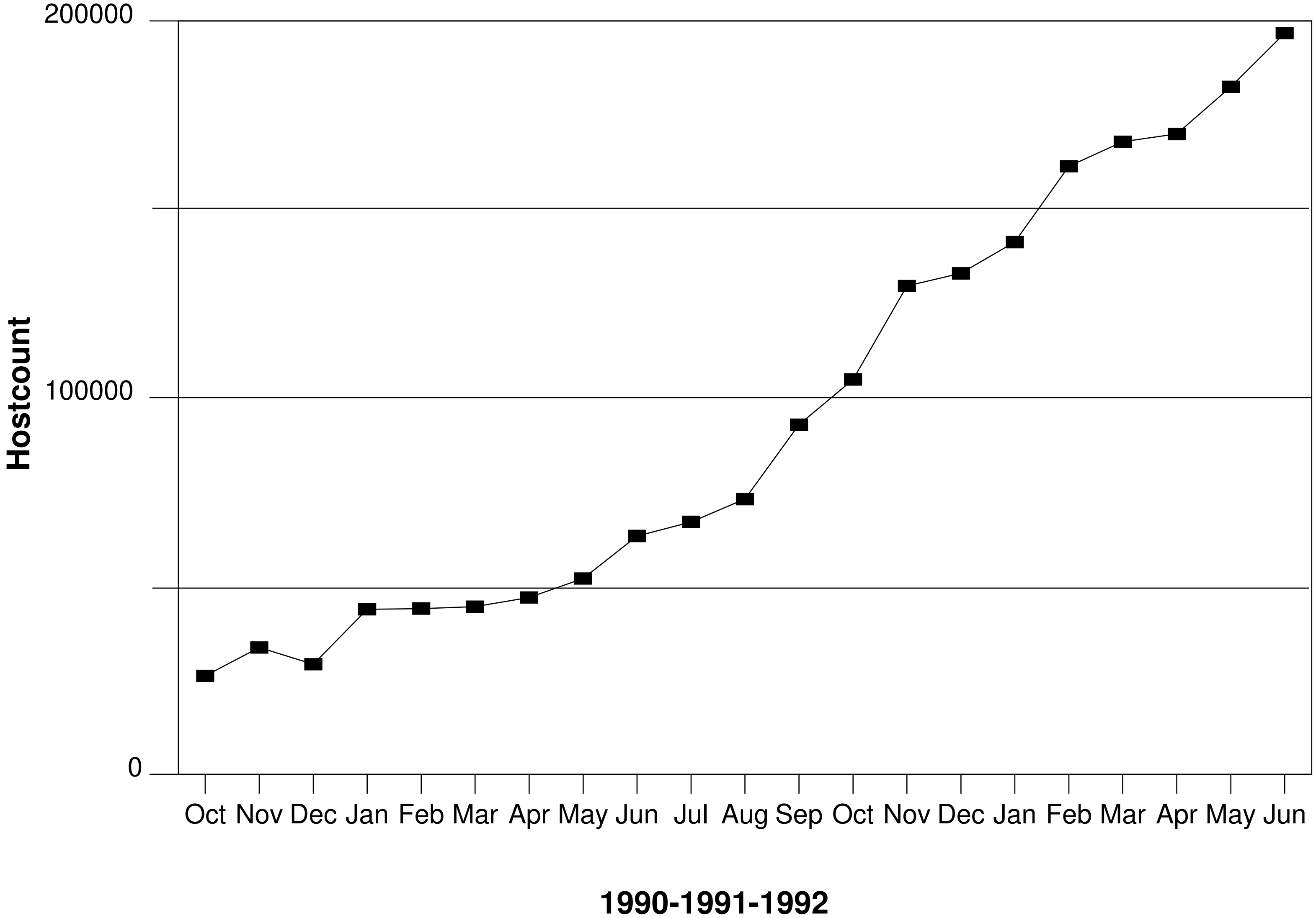
RIPE Database Objects



Networks in DNS Registered in RIPE Database



RIPE DNS Hostcount History



RIPE DNS Hostcount per Country, June 1992