Reśeaux IP Européens
Network Coordination Centre

Quarterly Report
First Quarter 1996

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1. Introduction

RIPE is a collaborative organisation which consists of European Internet service providers. It has been functioning since 1989. Today nearly 2.5 million computers in Europe and surrounding areas are reachable via networks coordinated by RIPE. RIPE aims to provide the necessary administrative and technical coordination to allow the operation of a seamless pan-European IP network.

The RIPE NCC

The RIPE Network Coordination Centre started operations in April 1992. It supports RIPE activities that cannot be effectively performed by volunteers from the participating organisations. Key services performed by the RIPE NCC include:

- Maintenance of the RIPE Network Management Database
- Regional Internet Registry
- Domain name system (DNS) coordination
- Repository for network operations software
- Maintenance of the RIPE document store
- Interactive Information Services

The TERENA association provides the formal framework for the NCC. Funding for the operation of the NCC is provided by the Internet service providers in Europe and surrounding areas.

General information about the NCC, its funding, organisation and activities can be found in the following documents:

Doc ID	Title
ripe-125	RIPE NCC Activity Plan
ripe-133	RIPE NCC Activities & Expenditure 1996
ripe-134	RIPE NCC Revenue & Charging 1996
ripe-132	RIPE NCC Contributors Committee, Minutes Sept 1995

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The Q1-1996 Quarterly

In this report, we aim to inform the RIPE community in general and the RIPE NCC Contributors Committee in particular of our activities during the first quarter of 1996 and our plans for the next one.

Due to the severe resource shortage we experienced in the last couple of years the series of quarterly reports had to be interrupted for two years. This report represents a new start at the series with a revised and improved format. We welcome any comments and suggestions to further improve the usefulless of these reports.

2. Management Summary

The European Internet keeps growing. 66 new local Internet registries started operations during Q1-1996. This is more than one per working day and again more than foreseen. During Q1-1996 alone, we manually handled 9,173 messages and automatically handled 21,653 messages that were sent to the RIPE NCC role mailboxes.

Registration services continued to operate normally, albeit with an increasing backlog due to factors including increased demand and some hostmaster staff leaving unexpectedly. We have successfully hired very promising replacements for the hostmasters who left us. We continued gathering hostcounts, providing local registry courses and information services on the Internet.

Significant activities during the quarter were the beta release of an improved RIPE database software package, implementation and initial deployment of the new request tracking system for part of the manually handled messages, continuing work on the a new WWW site as well as analysis and reduction of redundant routing information originated by European autonomous systems. Also the long expected business manager has started.

The financial situation is very healthy with 60% of this year's planned expenditure already received in revenue.

During Q1-1996 we have further consolidated current activities. We also consider it significant that after a long time we succeeded to start a new technical activity, reacting quickly to a requirement from the RIPE community. We made plans for re-structuring of the systems and software area within the NCC and obtained authorisation from TERENA to hire staff to strengthen this area as well as one additional hostmaster in registration services.

During Q2-1996 significant activities will include training of new hostmaster staff, more training courses for local Internet registries, development and deployment of hierarchical authorisation for the RIPE database, completion of the ripe-104++ document on local IR policies, launching of the new WWW site and the (re)start of more technical activities.

Strategically we observe that the Internet is currently changing too quickly for stringent 12 month planning cycles. We will make efforts to adapt more quickly to these changes. We expect to propose changes to the 1996 NCC budget during the next quarter.

Considering the rapidly changing environment it supports and operates in, the RIPE NCC is healthy and functioning well.

3. Core services

In this section, we describe the activities in NCC core services which were carried out during Q1-1996.

3.1. Role Mailbox Traffic

The NCC handles requests and queries almost exclusively by electronic mail. A number of *role mailboxes* are used for this purpose. These mailboxes are regularly serviced by the appropriate NCC personnel or automated procedures. Personal mailboxes are rarely used for request handling. While `<ncc@ripe.net>` serves as a catch-all for all sorts of queries and requests, the other mailboxes are intended for specific types of requests:

`<ncc@ripe.net>`
: handles all general queries and redirects requests to other role mailboxes or specific staff members as necessary. This mailbox also handles some internal procedures such as disk backups and absence logging. Consequently not all messages received originate outside the NCC.

`<billing@ripe.net>`
: deals with all aspects of the formal relationship with NCC customers, such as invoicing, execution of service agreements and general information for new customers.

`<hostmaster@ripe.net>`
: deals with the allocation and assignment of IP address space and other Internet numbers such as autonomous system numbers. This is the main mailbox of registration services and our primary interface with local Internet registries. Note that this is a service supporting local IRs in the most complicated assignments as well as providing them with allocations of address space. Simple assignments are being handled autonomously by local IRs.

`<auto-inaddr@ripe.net>`
: receives requests for DNS delegations in the `in-addr.arpa` domain which is used to reverse map from IP addresses to domain names. This is an automatic mailbox which analyses the requests and checks whether the DNS servers to which delegation is requested are set up properly. Once a request passes the checks it is forwarded to `<inaddr@ripe.net>`.

`<inaddr@ripe.net>`
: performs manual checks on delegation requests passing the automated tool and configures the NCC DNS server according to the requests. This mailbox also handles unusual requests and general questions about reverse delegations.

`<auto-dbm@ripe.net>`
: receives requests for updates to the RIPE network management database. This is an automatic mailbox which analyses the requests, performs authorisation checks and then does the actual updates requested.

`<ripe-dbm@ripe.net>`
: receives questions and requests regarding the RIPE network management database which cannot be handled by `<auto-dbm@ripe.net>`.

In addition to those listed above we have a number of role mailboxes dealing with meeting and course registrations.

In the table below you find counts of the number of messages being received by the various role mailboxes during Q1-1996.

Messages received by role mailboxes in Q1-1996	
ncc	3152
billing	1022
hostmaster	2639
auto-inaddr	1957
inaddr	1292
auto-dbm	19696
ripe-dbm	1068

The busiest manual mailbox is `<ncc@ripe.net>` receiving more than 50 messages per working day on average. The recently established `<auto-inaddr@ripe.net>` now receives more than 50% more messages than its manual equivalent, reducing the load here considerably. The manual role mailboxes receive 152 messages per working day on average, most of which originating from NCC customers. The automatic mailboxes handle another 360 messages per working day.

3.2. Registration services

During Q1-1996, five staff members were involved in Registration Services, namely: John Crain, Soodabeh Eshghi, Mirjam Kühne, Hatice Kuey, Nick Reid and Els Willems.

Unfortunately, during Q1-1996, both Soodabeh Eshghi and Hatice Kuey left their posts at the RIPE NCC. However, we have been able to hire Paula Caslav and Lee Wilmot to replace them, both of whom we are certain will be good additions to the registration services team. They both will start in April.

More details on the state of affairs in Registration Services at the end of January, 1996 can in be found in:

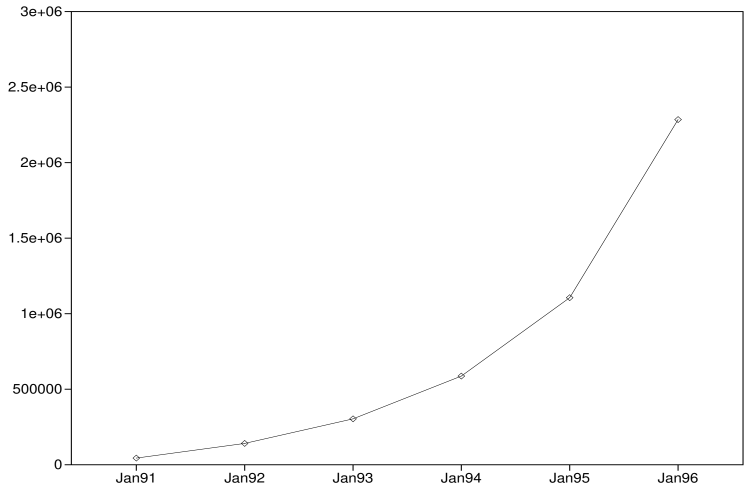
ftp://ftp.ripe.net/ripe/presentations/ripe-m23-mir-RS-REPORT.ps.gz

Following the same tradition, a report on the situation in mid-April, 1996 will be published in:

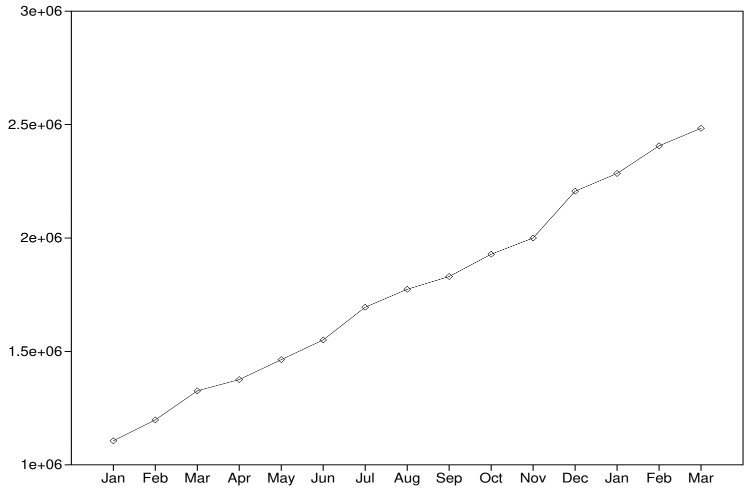
ftp://ftp.ripe.net/ripe/presentations/ripe-m24-mir-RS-REPORT.ps.gz

3.2.1. Hostcount

One of the popular services provided by the RIPE NCC is the regular host-count reports which track the growth of the Internet in Europe. Here we present a brief summary of our recent findings. In the following graph, we demonstrate the exponential growth in the number of hosts connected to the Internet in Europe over the last five years.



The number of hosts connected to the Internet in Europe continues to grow Q1-1996, as illustrated in the graph below.



Some of the anomalies in the hostcount statistics are caused by connectivity problems. Others are caused by neglect of DNS zone maintenance. In both cases, the data is usually corrected in later months with the growth following its general exponential behaviour.

The hostcount is based on the number of hosts counted in 51 DNS Top Level Domains (TLD's). In Q1-1996, two new TLDs were added to the set contributing to the hostcount produced by the RIPE NCC, namely:

VA: Vatican City State (Holy See)
SM: San Marino

The complete set of TLDs contributing to the statistics shown here are listed in Appendix A.

Historically, the majority of the hostcount statistics have been gathered remotely by the RIPE NCC. Due to the network overhead, and the anomalies which occur due to connectivity problems, an effort is underway to have hostcounts performed locally and compile the results at the NCC. At the end of Q1-1996, local counts are performed for 21 TLDs, four more than at the start of the quarter. The RIPE NCC still performs 30 hostcounts remotely, so this effort will continue for the foreseeable future.

3.2.2. Number of Local IRs

In the first quarter of 1996, there has been a sudden and substantial increase in the number of new local IRs. Throughout 1995, approximately 15 new registries started operations each month. In January 1996, the growth in the number of new registries increased by more than 30 percent, and throughout Q1-1996, we have had more than 20 new registries each month.

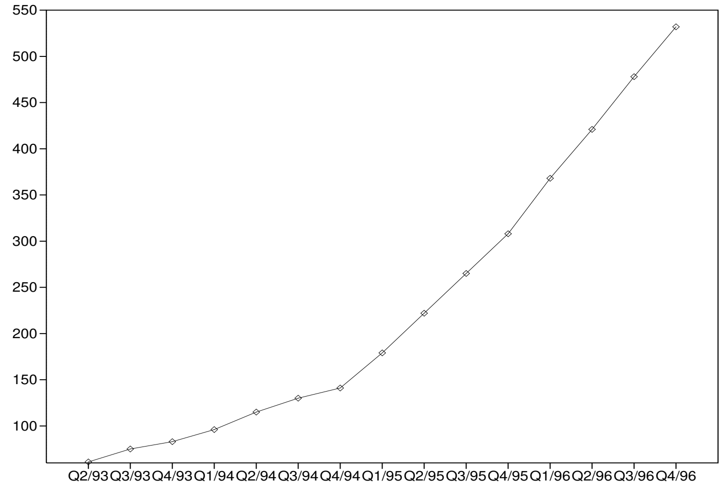
In the table below, we show the number of registries of varying types and sizes for each quarter in 1995 and for Q1-1996, along with the projected numbers for the remaining quarters in 1996. Our projection assumes the growth rate will slow down and stabilise to about 18 new registries a month. If however the number of new registries continues to grow at the current rate, we will have about 550 registries at the close of 1996, nearly twice as many as at the close of 1995.

Number of Local IRs

Type	OBSERVED					PROJECTED		
	Q1 1995	Q2 1995	Q3 1995	Q4 1995	Q1 1996	Q2 1996	Q3 1996	Q4 1996
Large	17	19	25	28	32	36	40	44
Medium	31	35	36	40	49	56	64	72
Small	84	119	159	196	246	290	337	382
Enterprise	15	17	15	16	19	21	24	26
Last Resort	32	32	30	28	22	18	13	8
TOTAL	179	222	265	308	368	421	478	532

As can be seen in the table, closure of the last resort registries is proceeding, but taking somewhat longer than originally expected.

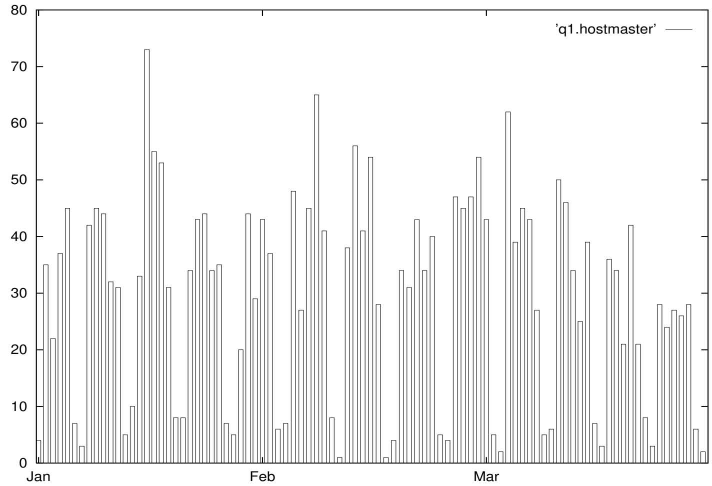
The following graph illustrates the growth in the total number of local Internet registries:



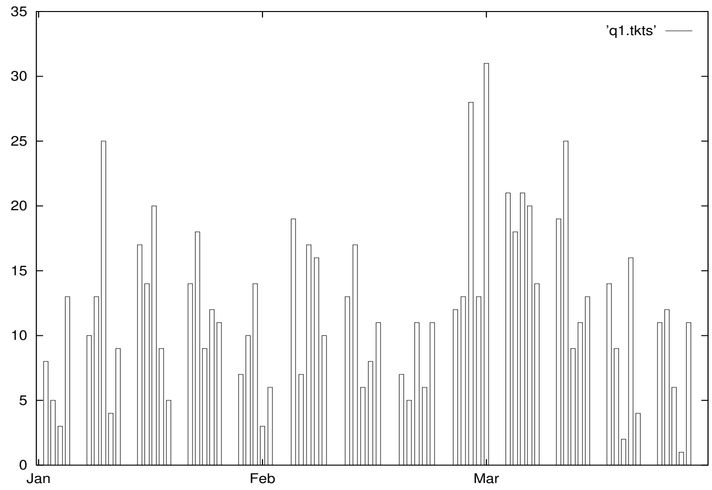
3.2.3. Registration Services Usage Statistics

Hostmaster Workload

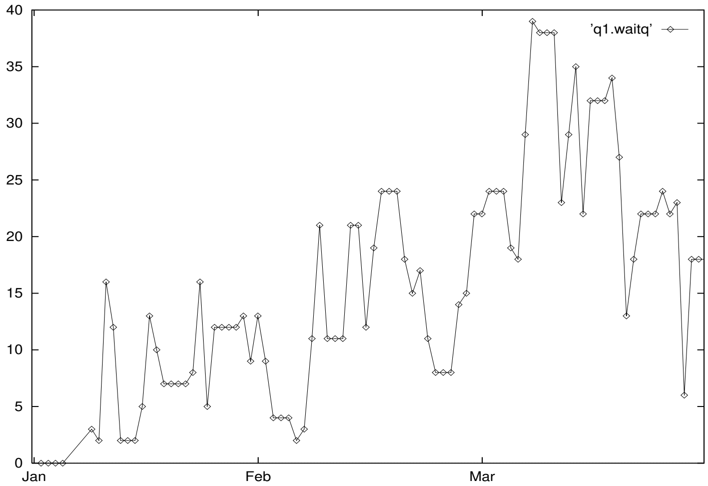
To give an indication of the workload in the hostmaster arena throughout the quarter, one can view the following graph in which we show the number of incoming messages to `<hostmaster@ripe.net>` per day during Q1-1996.



In the next graph we show the number of new requests opened per day in the hostmaster mailbox. Note that this is lower than the number of messages as many messages may be sent back and forth regarding a single request.



Finally, we show the level of the hostmaster wait queue during Q1-1996. This is a daily count of the of requests which are opened but not yet assigned to a specific hostmaster for processing.



The wait queue is a good measure of the responsiveness of the service. The shortage of hostmasters in Q1-1996 is clearly reflected in the slow but steady increase in the wait queue. This is aggravated by additional hostmaster resources spent on the automation of request tracking. It is clear that current staffing in Registration Services is just sufficient to handle the load, but insufficient to provide predictable service in the face of unexpected shortages and increasing demand.

In the course of Q2-1996, we will continue to track the the Registration Services workload, and start collecting information about the nature and frequency of different types of requests being submitted. By doing so, we hope to increasingly quantify how much work we perform in different areas, both in order to develop a usage based charging model and to identify the most effective task areas for further automation.

3.2.4. Policies and Procedures Documentation

At the end of 1995, and the start of Q1-1996, substantial progress was made on the ripe-104++ document on "policies and procedures for local IRs". The first half of the document was approved by the Local IR working group at the 23rd RIPE meeting held in late January 1996. A draft version of the document is available in postscript and in ASCII:

ftp://ftp.ripe.net/ripe/drafts/ripe-104++.ps
ftp://ftp.ripe.net/ripe/drafts/ripe-104++.txt

Due to other demands on the staff members involved in writing this document, progress has slowed in the latter half of Q1-1996. However, because of the heavy demands for it, we will put in substantial effort to finish it up in Q2-1996.

Simultaneously, efforts have been started to replace the forms (ripe-129) and procedures (ripe-128) documents which will be obsolete when the new policies and procedures document is finalised. The replacements for these documents will be published together with the new policy document ripe-104++.

3.2.5. New Request Tracking System

The first stage of the RIPE NCC Request Tracking and Ticketing System (RTT) was completed in Q1-1996. The system is used to redirect and track requests sent to `<hostmaster@ripe.net>`, handled in the Registration Services Department. At the end of March deployment of this system in parallel with current procedures has begun. Local IRs are not affected by the change in request tracking system, because RTT is compatible with current procedures and uses the current ticketing methods.

In addition to improving work-flow management, RTT will allow us to systematically record the activities performed by NCC hostmasters. This information will be used in the development of a usage based charging model in the second and third quarters of 1996.

3.2.6. In_addr Services

Because requests for reverse delegations are closely related to IP address space assignment and allocation requests, they are now processed by the Registration Services staff.

This has no influence on the way requests are handled nor the procedures to follow in submitting them. It is, however, a substantial addition to the workload in the Registration Services department, that is not reflected in the statistics about the hostmaster workload reported above.

As always, requests for a reverse delegation should be submitted to `<auto-inaddr@ripe.net>`. Questions to `<inaddr@ripe.net>`.

3.2.7. 195 from IANA

During the last four years, the RIPE NCC has distributed address space mainly from the range 193.0.0.0 to 194.255.255.255. Since most addresses in this range have now been assigned or allocated, IANA has now allocated additional address space to the RIPE NCC for distribution in its service area. The new address space ranges from 195.0.0.0 to 195.255.255.255.

In March, we began allocating addresses from the 195/8 address range. Because we have had one new local IR starting operations per working day since the start of this year, and taking into account the rate at which existing registries request new allocations, we expect to need still more address space from IANA near the end of 1996.

3.3. Services for New Registries

As detailed in Section 3.1.2, 60 new local IRs started operations during Q1-1996. To assure these new local IRs understand and operate according to the policies agreed to by the RIPE community, we provide them with extra support in the startup phase.

Our support for new registries falls into two primary categories, namely individual help in opening the registry, and the local IR training courses.

3.3.1. Help with Local IR Startup

The process of setting up new registries is handled by the RIPE NCC billing department. It involves some administrative steps including the signing of a formal agreement. In this phase, we try to assure each new registry gains access to basic information on IP address space allocation and assignment procedures.

Organisations that consider becoming a local IR usually send questions concerning the usefulness of setting up a registry and the consequences it has for them. Questions are received on the kind of service the RIPE NCC offers, formal agreements, IP address space allocation policies and Internet routing issues.

Whenever these organisations come to the RIPE NCC, the billing department tries to address their questions and to introduce those asking to the standard documentation that new registries should be aware of.

3.3.2. Local IR Training Program

During Q1-1996, we delivered 3 Training Courses for Local IRs, namely:

Q1-1996 Trainings	
February 1, 1996	Amsterdam
February 26, 1996	Paris
March 25, 1996	Lisbon

We allow a maximum of 15 persons to attend each course, and all three of the above were filled. To measure the effectiveness of our training course, we ask all persons attending to fill in an evaluation form. The results show our courses to be perceived well and considered useful.

Simultaneously, it has come to our attention that the people attending our courses come from increasingly diverse backgrounds. Some are network experts, while others have very little technical background. It may therefore be necessary to develop two different courses so that each of these groups can gain the information they need to operate a local IR as easily as possible.

Moreover, because of the rapid increase in the number of local IRs, our courses fill up very quickly upon being announced. We thus recognise the need to increase the frequency of these courses (see Section 6 for planned courses).

3.4. The RIPE Network Management Database

The RIPE database plays a key role in the European Internet. In this section we report on our recent progress and plans as well as on the current size of the database.

3.4.1. Recent Progress

During Q1-1996, a beta version of the RIPE database was released. Beta testing has shown it to be stable, and it will be put in production when the new machine for the RIPE database goes on line.

The main features of the new version are:

- nearly real-time mirroring;
- support for the BSD DB package;
- reduced memory consumption;
- a password controlled mechanism to overrule normal security mechanisms (e.g. for adding maintainers, etc.); and
- full support for network (non e-mail) updates.

Because network updates provide a powerful mechanism with which the majority of the RIPE database can be quickly modified and thus destroyed, only staff members of the RIPE NCC are currently permitted to perform them on the master database. Better security mechanisms must be implemented before they can be permitted for members of the community at large.

3.4.2. Current efforts

As agreed to at the Database Working Group meeting held at the 23rd RIPE meeting (January, 1996), the implementation of a hierarchical authorisation scheme to preserve the integrity of the RIPE database is currently receiving our full attention. The scheme is being implementing for the domain, inetnum, and route objects.

3.4.3. Usage statistics

In the following table we show the number of entries for the different objects maintained in the RIPE database.

RIPE Database Object	Number
as-macro	54
aut-num	716
community	7
domain	30192
dom-prefix	6
inetnum	46268
inet-rtr	93
mntner	552
person	63075
route	12669

During Q1-1996 the NCC whois server has received 2,240,377 queries. 19,696 e-mail update messages were processed.

3.5. Information Services

One of the key roles the RIPE NCC plays in the European Internet is that of publishing documents and making information readily available. The NCC produces numerous documents important to Internet coordination. Moreover it makes an extensive set of Internet related documents available via ftp.

3.5.1. The RIPE ftp Site

At our ftp site (*ftp://ftp.ripe.net*), one can pick up the key Internet documents. Specifically, we make available a total of 574 MB of useful documents and tools most of which fall in the in the categories described in the following table.

ftp://ftp.ripe.net		
name	Contents	MB
cidr	CIDR related tools and documents	36.4
current-ietf-docs	IETF announcements	3.0
earn	the EARN tool-guide and newsletter	1.1
fyi	Internet For Your Information memos	2.2
iab	Internet Architecture Board minutes	6.8
iesg	IETF Steering Group minutes	16.6
ietf	IETF document set	10.5
internet-drafts	Drafts submitted for RFC's	33.9
iso3166-countrycodes	ISO 3166 country codes	0.2
isoc	Internet Society related information	119.0
nsf	National Science Foundation reports	18.3
pride	Pride project tools and documents	2.5
rare	The RARE document store	5.1
rfc	Internet Request for Comment document store	74.6
ripe	RIPE documents, minutes, presentations, etc.	249.3
tools	Lots of useful Internet tools	11.3
ww-connectivity	World Wide Connectivity Maps	4.8
Total	The complete ftp store	574.4

During Q1-1996 the NCC ftp server transferred 949,700 files totaling 74,621 MBytes to 13,122 different clients. The most popular areas are the RIPE hostcount followed by the RIPE database files, the RIPE documents and the RFCs.

3.5.2. The RIPE WWW Site

The NCC http server answered 81,333 queries by 17,552 different clients during Q1-1996. The most popular areas are general information about RIPE and the NCC, forms and procedures documents followed by information about projects such as PRIDE.

The NCC took a pioneering position by operating one of the first WWW sites. At present, however, the presentation has become outdated, and maintainability has become a problem. In the latter half of 1995, and in the first quarter of 1996, major effort has been put into the development of a new WWW site. Our new site is primarily being produced by external contractors, more specifically by a number of experts from the "School voor Communicatiesystemen" in Utrecht specialising in interactive communication systems. Throughout this quarter, we have been in close contact with those working on the site to assure it will meet the needs of the European Internet providers.

The new site (to be launched in Q2-1996) was developed to provide a good interface to the RIPE document store and information resources. As such, the effort has been to

A) provide an excellent user interface
B) introduce a long term and robust structure on the set of documents and the links between them.

While the latter will not be directly visible to those visiting our WWW site, it will assure that we are able to provide an up-to-date hyperlink interface to the current RIPE documents with a minimum of effort.

In the 23rd RIPE meeting in January 1996, a number of requests were made that new interactive services be made available on our WWW site. We have modified the structure of the new site to include these services. Development of the new services will receive our attention after the new site is launched in Q2-1996.

3.6. RIPE Meetings

RIPE meetings are held three times a year. Traditionally two are held in Amsterdam and one is hosted by an organisation elsewhere in Europe. The meeting consists of working group sessions that focus on specific topics, and a plenary session with general presentations. RIPE meetings are open to everyone interested in them.

3.6.1. RIPE-23

The 23rd RIPE meeting was held January 29th-31st 1996 in Amsterdam. There were 120 attendees. The minutes of the meeting are available from

ftp://ftp.ripe.net/ripe/minutes/ripe-m-23.txt
ftp://ftp.ripe.net/ripe/minutes/ripe-m-23.ps

A number of RIPE NCC staff members made presentations at the meeting. The transparencies used in the presentations can be found in:

ftp://ftp.ripe.net/ripe/presentations/ripe-m23-david-DB-REPORT.ps.gz
ftp://ftp.ripe.net/ripe/presentations/ripe-m23-david-DNS-INADDRCHECK.ps.gz
ftp://ftp.ripe.net/ripe/presentations/ripe-m23-mir-RS-REPORT.ps.gz

3.6.2. RIPE-24

Preparations are underway for the 24th RIPE meeting to be held April 22nd-24th 1996 in Berlin. Up-to-date information can be found at the URL

ftp://ftp.ripe.net/ripe/Next-Meeting/

3.7. Computing Systems

In order to support the core services described above, a robust computing infrastructure is essential. During 1995 and at the start of 1996, much effort has been put into modifying the RIPE NCC infrastructure. Our primary goals in the upgrade process are to provide reliable network services to the RIPE community; to replace old equipment; and to expand our infrastructure to accommodate the recent growth in personnel.

The old Sun workstations are slowly being replaced due to aging (most date back to 1992), and new workstations are being purchased to accommodate the new NCC staff. Moreover disk space has been expanded for the new staff. The effort to phase in new equipment based on the BSD/OS operating system and x86 processors was started in 1995 and continues at present.

In the area of servers emphasis is placed on increased reliability and serviceability with redundancy where feasible. To minimise the effects of external factors, the servers used in the new infrastructure are based on industrial PC chassis and housed in 19 inch cabinets.

4. Other Activities

4.1. Reducing Redundant Routing Information

During RIPE23 the NCC was asked to address the problem of unnecessary redundant routing information originated by European ASes. To this end we have analysed BGP routing tables of the NCC external router `Amsterdam.ripe.net` in order to find redundant routes. Redundant routes are those that can either be aggregated with other equivalent routes or are covered by less specific equivalent routes. We have found equivalent routes by looking separately at each set of routes which reach `Amsterdam.ripe.net` through a unique set of BGP paths. We believe that no routing information will be lost by eliminating redundant routes in each set. Note that this is different from considering just all routes originated by the same AS; such routes could still be propagated along different paths in which case combining them would loose routing information.

This is an extremely simple model which can easily be refined to find more redundancy. Starting with a simple model has the benefit of expediency and avoids errors which may reduce the credibility of the whole effort.

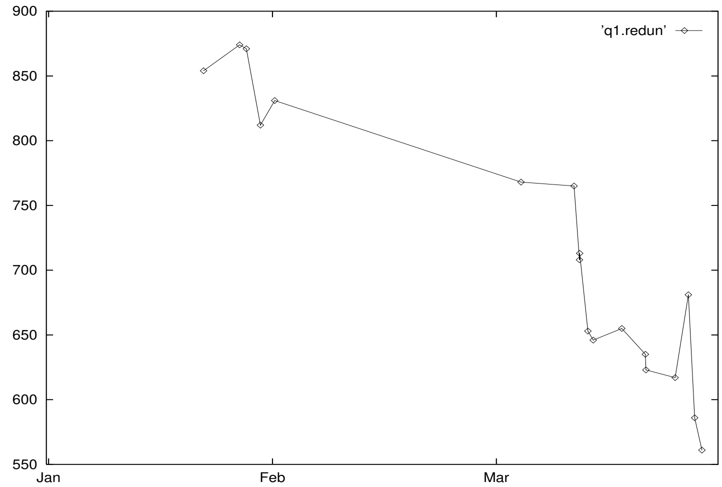
Initial Results

Looking at the routing tables of the whole Internet we found initially that as much as 22% of the routes reaching us were redundant. This was reported to the RIPE community and presented at an IETF BOF. We then looked only at routes within 193/8 and 194/8, i.e. routes to address space assigned via the RIPE NCC. Initially we found that the level of redundancy was about the same as that of the Internet at large.

We then made tools to generate warning messages to ASes originating redundant routes within 193/8 and 194/8 as well as their immediate neighbor transit AS as seen from `Amsterdam.ripe.net`. The same tools also generate lists showing those originators and transit ASes. These lists were sent to the relevant RIPE WGs.

Alert the Originators

On March 12th we sent out the first messages and published the first lists. As you can see on the graph below this resulted almost immediately in a sharp decrease of redundant routing information. We must conclude that there are ISPs willing to act on these warnings. Because full automation of the process is still in progress the tools were run at irregular intervals.



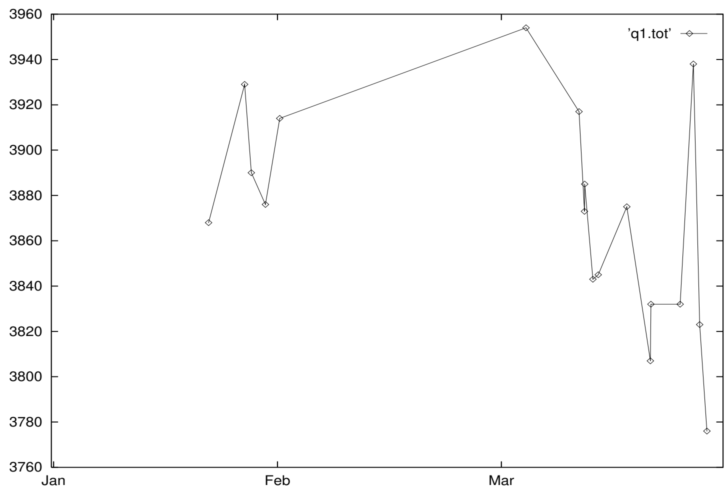
On a number of occasions analysis of the information produced by the tools revealed significant increases in the number of redundant routes for particular ASes which turned out to be caused by configuration errors. These were fixed quickly after the ASes in question had been notified by the NCC.

The information generated by the tools is available at `ftp://ftp.ripe.net/ripe/less-routes/`. Note that currently the tools are run irregularly and the output is still being refined.

Positive Effects

It appears that small ASes are more responsive than big ones and that some major sources of redundant information have not yet been eliminated. Nonetheless the percentage of redundant information has decreased from 22% initially to 14% at the end of the quarter.

When looking at the total number of routes to 193/8 and 194/8 we can see that reducing redundant routes has a definite effect.



More importantly the total number of routes announced has shown a definite structural decrease while the number of hosts addressable by all routes is still structurally increasing as usual.

The effort has definitely been useful so far and will be continued.

Further Plans

Analysis of the information will be further automated and scheduled regularly. The dissemination of warning messages and 'hit-lists' will also be automated as much as possible. Data will be analysed to detect excursions caused by configuration errors to provide near-real-time warnings to the AS contacts concerned. The model will be refined to find more redundancy.

The analysis should be based on more comprehensive data. There are two ways to achieve this. Data sets could be imported from other well connected routers, merged and then analysed. The tools could be moved from `Amsterdam.ripe.net` to another machine dedicated for the purpose. ISPs could then peer with this machine to provide their routing views. The latter approach appears more practicable and will be pursued.

It is also possible to apply the tools to routing information for address space assigned via other regional registries. This is currently not planned due to resource shortages.

4.2. Back Burner

Due to the growing workload in the core services area, little progress has been made on some of our technical projects during Q1-1996.

4.2.1. IPv6 Tracking

The work to be performed by the RIPE NCC in tracking the IPv6 development efforts has been postponed. This is because of the extensive work involved in the deployment of a new computing infrastructure and a shortage of technical personnel.

Unfortunately, we do not foresee any improvement in this situation during Q2-1996, but do hope we can restart these efforts in the latter half of 1996.

4.2.2. Restart Routing Registry project

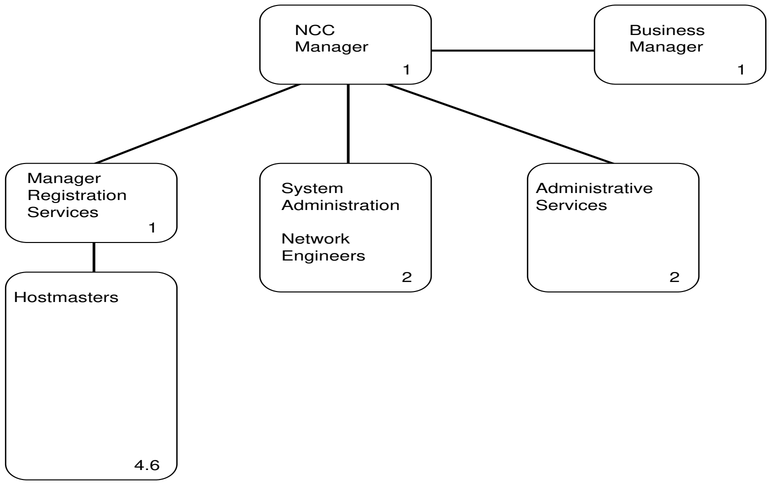
No progress has been made in the RR project during Q1-1996. However some of the changes in the organisation are being made with the intention of making it possible to restart activities in this area. We expect to do so in the latter half of 1996.

5. RIPE NCC Staffing

Q1-1996 was a dynamic quarter for the NCC staff. Two people started, two left, two were hired, and plans were made to hire three more. In this section, we briefly discuss these changes and how they effect operations at the RIPE NCC.

5.1. Staffing - End Q1-1996

At the end of Q1-1996, there were 12 positions (11.6 FTE) at the RIPE NCC, with the staff members performing a variety of tasks. The core activities performed by NCC staff are registration and information services. Some staff members perform administrative and technical duties to support the core activities. The organisational structure of the RIPE NCC is depicted in the figure below.



Due to a shortage of staff, there are a number of activities in the RIPE NCC Activity Plan that we are unable to perform satisfactorily at this time. Examples include PRIDE tool and Routing Registry maintenance. Meanwhile, we frequently receive requests for new services which we are unable to perform due to the concentrated effort on registration services. During the 23rd RIPE meeting, for example, many requests were made for new services on our WWW site. Finally, there are a number of single points of failure, that is critical activities which can currently only be performed by a single staff member. This makes it almost impossible to guarantee some essential services. The most critical are related to system administration and network services.

5.2. Recent changes in Staff

Before discussing how we will address the staff shortages outlined above, we will discuss the changes in NCC staffing which took place in the first quarter.

New Staff in Q1-1996

In mid-January, Naomi de Bruyn joined the administrative staff of the RIPE NCC where she performs secretarial services. Among other things, Naomi answers the phone, handles questions sent to <ncc@ripe.net>, maintains an agenda for staff members, and helps with the coordination of RIPE meetings and local IR training courses.

Carol Orange also joined the staff of the RIPE NCC in mid-January as "Business Manager". Because of ongoing commitments elsewhere, she started at the NCC on a part-time basis. Since March 1, 1996, she has been working full-time. In addition to daily management tasks arising at the NCC, she is involved in the production of the IR policy and procedure documents (ripe-104++, ripe-128++), financial planning and controls, the WWW project, registration services software projects, administrative services, local IR courses, NCC staff training, and planning and reporting activities.

Exiting Hostmasters

Both Soodabeh Eshghi and Hatice Kuey resigned their hostmaster positions at the NCC in Q1-1996. Unfortunately Hatice Kuey had to leave for personal reasons quite unexpectedly and suddenly at the end of March. Both Soodabeh and Hatice made valuable contributions while working at the NCC and will be missed.

While working at the NCC, Hatice Kuey developed and launched the first version of the new request tracking system which is now used for work-flow management in the Registration Services department. Due to the suddenness of her departure, however, the implementation of the system had to be raised in priority, documentation had to be completed, and the software had to be turned over to another staff member for long term maintenance and enhancement. This resulted in a delay for some other activities which were planned in that period.

Staff Hired

As soon as it became clear that hostmasters were going to leave, we started a hiring effort to find replacements. This has been successful. We found Paula Caslav and Lee Wilmot who will fill the vacated hostmaster positions. Paula has a background in journalism, and Lee has a background in computer and cognitive sciences. Both start working at the NCC in April 1996, and we are certain they will make strong contributions to the Registration Services department.

5.3. NCC Staff Planning

The number of local Internet Registries we support is growing at the rate of approximately one per day, and this growth is expected to continue or to increase for the foreseeable future. It is essential that in our efforts to address our staffing shortages, we take into account the expected growth in our work load.

Many of the repetitive tasks performed by the registration services staff have been partially or completely automated. There are a number of other tasks that can still be automated and some areas in which automation can be improved. In particular, providing customers with tools to submit requests quickly will result in a substantial reduction in work for the registration services staff, and reduce the work load of our customers as well. Producing user friendly software tools with good documentation and support will, however, require a substantial effort. This will be necessary if we are to prevent our work load from growing in proportion to the growth of the Internet.

By spending effort on automating these services rather than simply performing them, we can reduce the number of administrative and hostmaster staff that must be hired in the future. This approach is both cost effective and good for stability. It also allows us spend more time on both technical and service activities that have had to be postponed in the past.

Strategically, to allow for automation of our current and future processes, we need to improve staffing in the area of systems and software support. Currently, there is a strong need for coordination of systems maintenance and software development activities. We also need backup support when the systems administration staff is unavailable.

It is worth noting that in the latter part of Q4-1995 and the start of Q1-1996, our registration services have been operating without a wait queue. However, since two of our hostmasters left the NCC in Q1-1996, the wait queue is back and slowly increasing over time. This confirms our estimation that the registration staff at the start of 1996 is what is currently needed to perform the hostmaster services within an acceptable response time.

However, there area number of reasons to further increase the registration services staff immediately. The number of requests for registration services is not constant, and currently one bad week can result in an increased wait queue over a longer period. We also have no buffer for illness and other unexpected absences with our current staff, nor have we time for the ongoing training the job requires. Since substantial on-the-job training is required before a new staff member can perform the hostmaster tasks, we need to hire new hostmasters far before they become essential for handling the load. Once the new hostmasters are fully trained, we expect to have sufficient capacity to cope with peaks in the work load, absence of staff members, and similar factors which effect the response time. The hostmasters will then also be able to structurally spend time on other activities which currently receive sporadic attention at best.

For the reasons stated above we plan to hire the following additional staff as soon as possible:

1. Manager - Systems and Software

   This staff member will be responsible for the coordination of activities involved in NCC systems administration and software development, and for the management of staff members responsible for these activities. This person will play a key role in the long term planning of the network systems used by the NCC staff, and in coordinating the execution thereof. Moreover, this person should identify those areas in which RIPE NCC services can be automated, and in cooperation with RIPE NCC senior staff members, prioritise and coordinate software development activities.

2. Network Engineer

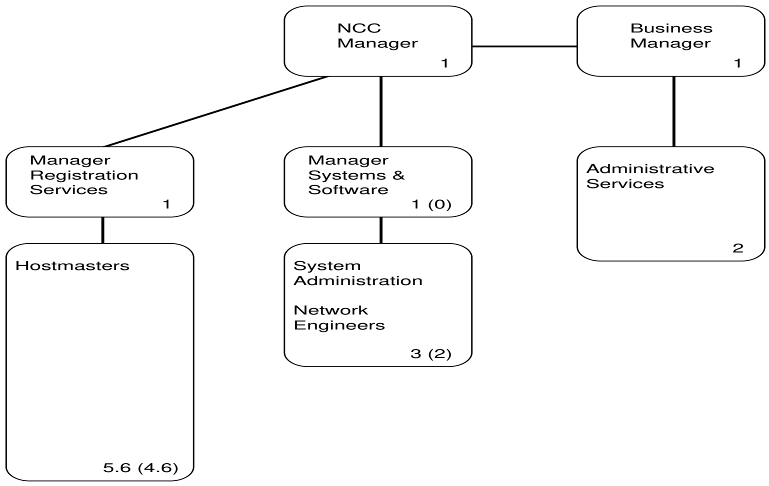
   This staff member will develop and document tools for registration services and administration services as needed. Some of the tools will be for our customers, to assist them in performing registration services. These tools will reduce the workload on the hostmasters substantially. Others will be for use by the NCC staff. Moreover, in cooperation with our network engineer, the RIPE database software may be maintained and further developed by this person.

3. Junior hostmaster

   This staff member will be responsible to perform those duties required of the registration services staff. Moreover, this staff member will be responsible to help with technical writing, and other information services activities whenever possible.

We expect that this combination of new staff members will allow us to meet the short term needs of our customers, and to prevent unnecessary growth of the NCC in the long term.

With the inclusion of the new positions the organisational structure of the RIPE NCC will become:



This is a logical continuation of the restructuring we started by organising registration services under one manager. We now continue this with the staff working on systems and software. Further the staff performing administrative services will now report to the business manager.

These moves relieve the NCC manager of many recurrent tasks and responsibilities for details. As has been requested by both RIPE and the contributors committee, he will then be able to concentrate on planning and strategy as well as on identifying and leading technical activities that need attention. It will also allow the NCC manager to take up one day per week of unpaid parental leave during the latter part of 1996.

This restructuring also provides for greater resilience of the NCC as there will be a backup person for all management tasks. Managers will also be actively performing some of the activities.

6. Financial Summary

Because of the absence of RIPE NCC Quarterlies in 1995, we will open this section with a brief summary of the financial information for the 1995 calendar year. We will then summarise the state of our finances at the close of Q1-1996.

6.1. 1995 Income and Expenditures

Registries reported above, the number of local IRs in the service area of the RIPE NCC more than doubled. This resulted in a healthy income, but of course imposed an increased workload.

For services performed in 1995, we sent out invoices for a total of 986 kECU. At the end of Q1-1996, we had received 934 kECU for services performed in 1995, 95% of the invoiced amount. According to policy the few non-paying registries are not receiving services from the NCC. They will be closed after a sufficient warning period is exceeded.

RIPE NCC expenditure for 1995 approved by the NCC contributors in September 1994 was 407kECU. In June 1995 this was increased to 529kECU in order to account for unexpected growth in demand. At the end of the year total expenditure was 535 kECU, within 2% of the budget.

The details of how much we spent on various activities will be published in the 1995 RIPE NCC Annual Report once the 1995 accounts have been closed and audited.

Note that our actual income for services provided in 1995 (934 kECU) is 174% of our expenditures (535 kECU) in the same year. This has allowed us to both lower our fees by about 30% and to start building financial reserves essential to the long term stability of the NCC.

6.2. Quarter Summary: Q1-1996

At the start of 1996, there were a total of 308 local Internet registries in the RIPE NCC service area. Now there are 368, and given that some of the last resort registries have closed shop during this time, we've had a total of 66(!) new local IRs starting operations during Q1-1996. This enormous growth in the number of registries has a large impact both on our income, and on our expenditures.

The expenditure budget for 1996 approved by the RIPE NCC contributors committee in September 1995 is 916 kECU. While details about expenditure in the Q1-1996 are not available at the time of this writing spending is within the budget allotted.

At the end of Q1-1996, we had commitments for 795 kECU of revenue, which is 86% of the expenditure budget. We had sent invoices for 785 kECU, and received a total of 557 kECU at the quarter's end. Therefore, 60% of the currently planned expenditure had been received in the first quarter. The NCC has a very healthy cash flow.

If the growth in the number of IRs continues at its present pace, our income for services performed in 1996 will exceed 1400 kECU and thus be 50% above currently planned expenditure. Of course this increase in demand will also require additional resources. Should this trend continue in Q2-1996 we will compile a revised budget to cope with it.

In general we observe that 12 month budgeting cycles are too long in the current rapidly changing Internet environment.

7. Q2-1996

7.1. Efforts and Expectations

Local IR Training

As discussed in Section 3.2.2., the variety in course attendees demands that we closely evaluate the structure of our training course. During Q2-1996, we will be doing this, and sometime in the latter half of 1996 we will announce different courses for those with and without a technical background. We believe the effectivity of the courses will be improved by doing so.

Because of the high demand for local IR Trainings, we have scheduled three courses to be held in Q2-1996. These are listed in the table below.

Q2-1996 Trainings	
May 10, 1996	Budapest
May 20, 1996	Amsterdam
June 7, 1996	Stockholm

If possible, additional trainings in Q2-1996 will be scheduled.

As always, we are happy if a local IR offers to host a course. However due to the high demand, we have decided to make an effort to hold courses frequently whether or not we have a host. To make it easy for people to attend these courses, most will be held at or near major airports in Europe.

The courses for Q3-1996 will be announced to the local IR mailing list as usual, and in this section of the Q2-1996 Quarterly as above.

RIPE Database Developments

Upon the completion of the hierarchical authorisation scheme, we will turn our attention to the automatic assignment of NIC handles. Minor changes to the syntax of the ’country’ attribute will also be made. We also aim to integrate the reverse delegation robot in the RIPE database software. This will allow us to use the authorisation mechanisms of the RIPE database for reverse delegations.

Integrity Effort for Registry Data

In addition to the closure of last resort registries, we will start to close registries that have never signed formal agreements with the RIPE NCC, as well as those who have long term outstanding bills. We will also make some modifications to our registry database software to prevent these entities from creating anomalies in our financial data.

Documentation

The successor to ripe-104, the European Internet Registry Policies and Procedures will be completed in Q2-1996. It will be sent to the Local-IR Working Group and to the contributors committee for review and approval. Together with this policy document, the accompanying forms and instructions will be published.

Staff Hiring

During Q2-1996, we hope to hire three new staff members, with the following job titles:

- Hostmaster (to keep registration services running smoothly)
- Network Engineer (to help in the effort to automate services)
- Manager - Systems and Software (to lead automation and systems activities)

Especially with the last two, we hope to gear up our automation and technical service activities.

New Activity Plan

At the RIPE-24 meeting in Berlin, the RIPE NCC Activity Plan for 1997 will be discussed. After agreement is reached in the RIPE community on the desirable set of activities for the NCC, we will examine it, and develop an associated budget for the RIPE NCC Contributors Committee.

New Charging Model

A significant effort on the investigation into usage based charging models for RIPE NCC services will be started in the second quarter.

Redundant Routing Information

Efforts to reduce redundant routes in Europe will be continued in Q2-1996. In particular, we aim to make the detection and reporting of redundant routes occur fully automatically at regular intervals.

Launch new WWW Site

Last but not least, we hope to have the new WWW site up and running in the latter part of Q2-1996.

Appendix A: Hostcount TLD's

The set of DNS Top Level Domains contributing to the hostcount statisics described in Section 3.1.1 are:

al: Albania
am: Armenia
at: Austria
az: Azerbaijan
be: Belgium
bg: Bulgaria
by: Belarus
ch: Switzerlan
cy: Cyprus
cz: Czech Republic
de: Germany
dk: Denmark
dz: Algeria
ee: Estonia
eg: Egypt
es: Spain
fi: Finland
fo: Faroe Islands
fr: France
gb: United Kingdom
ge: Georgia
gr: Greece
hr: Kroatia
hu: Hungary
ie: Ireland
il: Isreal
is: Iceland
it: Italy
li: Liechtenstein
lt: Lithuania
lu: Luxemburg
lv: Latvia
ma: Morocco
md: Republic of Moldova
mk: The Former Yugoslav Republic Of Macedonia
mt: Malta
nl: The Netherlands
no: Norway
pl: Poland
pt: Portugal
ro: Romania
ru: Russian Federation
se: Sweden
si: Slovenia
sk: Slovakia (Slovak Republic)
sm: San Marino
su: The Former Soviet Union
tn: Tunesia
tr: Turkey
ua: Ukraine
uk: United Kingdom
va: Holy See (Vatican City State)
yu: Yugoslavia