Reśeaux IP Européens
Network Coordination Centre

Quarterly Report

Second 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 3.3 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

Further information can be obtained by sending mail to <ncc@ripe.net> or contact us at:

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The Q2-1996 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 second quarter of 1996 and our plans for the next one.

Due to a resource shortage and a change over of positions in the third quarter this quarterly report is somewhat delayed in arrival and somewhat reduced in content. The Q3-1996 report will however be produced on time and will be more complete. We welcome any comments and suggestions to further improve the usefulness of these reports.

2. Management Summary

The European Internet continues to grow at a phenomenal rate. During Q2-1996 57 new local Internet registries started operations. This growing number of local registries proportionately increases our workload. During Q2-1996 alone, we manually handled 9,770 messages and automatically handled 26,913 messages that were sent to the RIPE NCC role mailboxes.

Registration services continued to operate normally, albeit with a constant backlog due to factors including increased demand and the training of new staff. The two newly hired hostmasters started work in Q2-1996 and have immediately settled in and made valuable contributions. We continued gathering hostcounts, providing local registry courses and information services on the Internet.

Significant activities during the quarter were among others; the publication of ripe-136 the "European Internet Registry: IP Address Space Assignment Policies and Procedures", which supersedes ripe-104; the continued development of the 2.0 release of the database software, planned to be released in Q3-1996; the implementation of the hierarchical authorisation mechanism for the inetnum and domain database objects; the launch of the ripe ncc web site; the start of the project looking into usage based charging models.

The financial situation is very healthy with more than 80% of this year's planned expenditure already received in revenue.

During Q3-1996 significant activities will include; pursuance of the stated staffing plan; giving more training courses for local Internet registries; presenting various usage based charging models to the contributors; publication of the 1997 activities and expenditure plan; and publication on the ftp site of individual allocation statistics.

Strategically we observe that the Internet continues to change too quickly for stringent 12 month planning cycles. We will carry on in our efforts to adapt more quickly to these changes.

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 Q2-1996.

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. A full description of the following mailboxes can be found in the Q1-1996 report (ripe-135):

```
<ncc@ripe.net>
<hotmaster@ripe.net>
<auto-inaddr@ripe.net>
<inaddr@ripe.net>
<inaddr@ripe.net>
<auto-dbm@ripe.net>
<ripe-dbm@ripe.net>
<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 Q2-1996.

Role Mailbox Activity Q2-1996	
Mailbox	Messages
ncc	3338
billing	977
hostmaster	3233
inaddr	1339
ripe-dbm	883
auto-inaddr	2209
auto-dbm	24704

A total of 9770 messages were sent to the manual mailboxes in Q2-1996, and the messages sent to automatic mailboxes totaled 26913. As may be expected, of the manual mailboxes, by far the most messages are sent to `<hostmaster@ripe.net>` and `<ncc@ripe.net>`.

On average, there are 150 messages sent to the manual role mailboxes each working day, most of which originate from NCC customers. Meanwhile, an average of 414 messages are sent to the automatic mailboxes each day.

3.2. Registration Services

During Q2-1996 seven staff members were involved in Registration Services, namely: Paula Caslav, John Crain, Mirjam Kuehne, Nick Reid, Els Willems, Lee Wilmot.

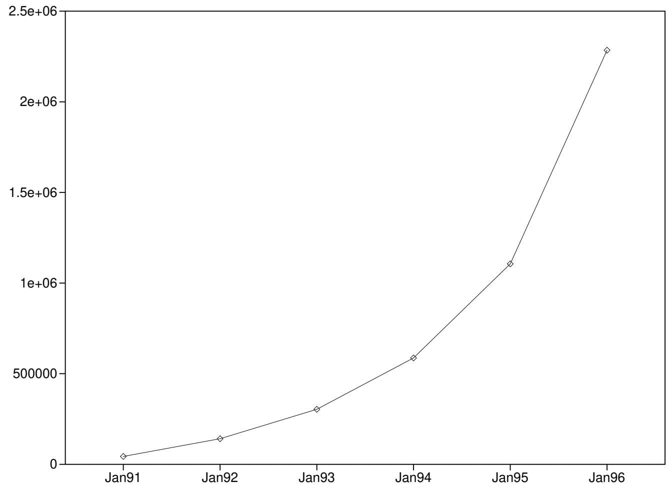
Paula Caslav and Lee Wilmot started in April to replace Soodabeh Eshgi and Hatice Kuey who left their posts at the RIPE NCC during Q1-1996.

More details on the status of affairs in Registration Services in mid-April, 1996 can be found in:

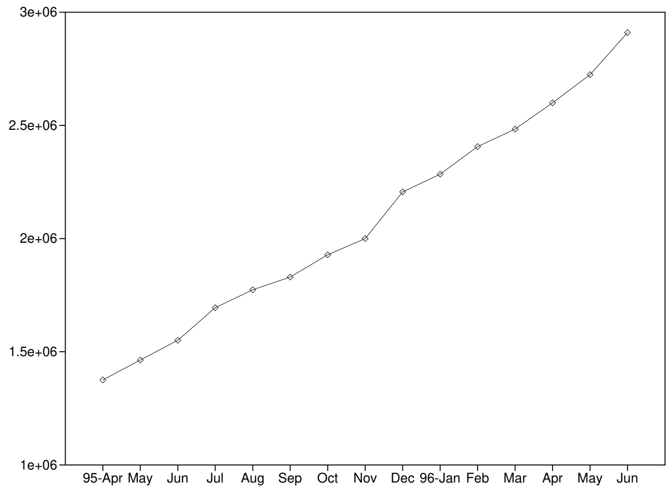
ftp://ftp.ripe.net/ripe/presentations/ripe-m24-mir-RS-REPORT.ps.gz

3.2.1. Hostcount

One of the services provided by the RIPE NCC is the regular hostcount report which tracks the growth of the Internet in Europe and surrounding areas. 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 continued to grow during Q2-1996, 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 53 DNS Top Level Domains (TLD's). The complete set of TLD's 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 network overhead, and the anomalies which occur due to connectivity problems, an effort is underway to have hostcounts performed locally per TLD and to compile the results at the NCC. At the end of Q2-1996, local counts are performed in 23 TLDs, 2 more than at the end of Q1-1996. 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 Q1-1996 the growth in new registries increased by more than 30 percent. This trend continued throughout Q2-1996. We still saw almost 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 and Q2-1996, along with the projected numbers for the remaining quarters in 1996. The projection we made in the first quarter of 1996 showed a stabilisation of the the growth rate to about 18 new registries a month. These projections were it seems too conservative. The same growth pattern can be seen in Q2-1996 and is expected to continue for the remaining quarters of 1996. This would then lead to almost 600 registries at the close of 1996, nearly twice as many as at the close of 1995.

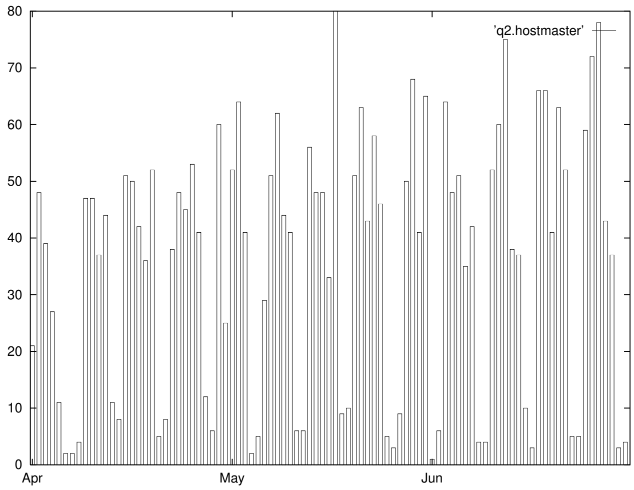
Number of Local IRs

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	34	37	41
Medium	31	35	36	40	49	53	60	65
Small	84	119	159	196	246	308	376	451
Enterprise	15	17	15	16	19	26	31	37
Last Resort	32	32	30	28	22	13	6	0
TOTAL	179	222	265	308	368	434	510	594

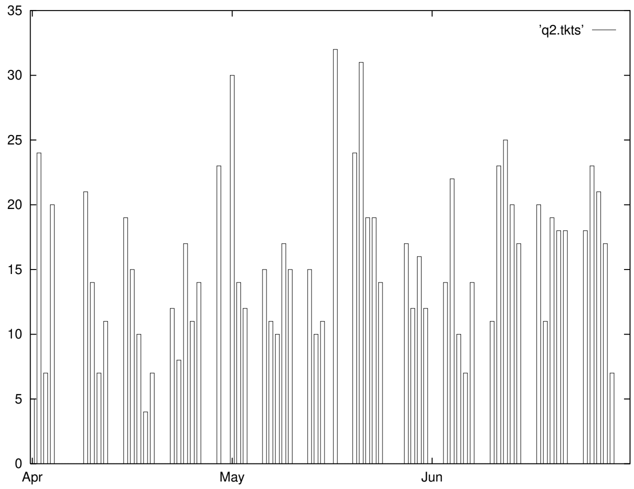
3.2.3. Registration Services Usage Statistics

Hostmaster Workload

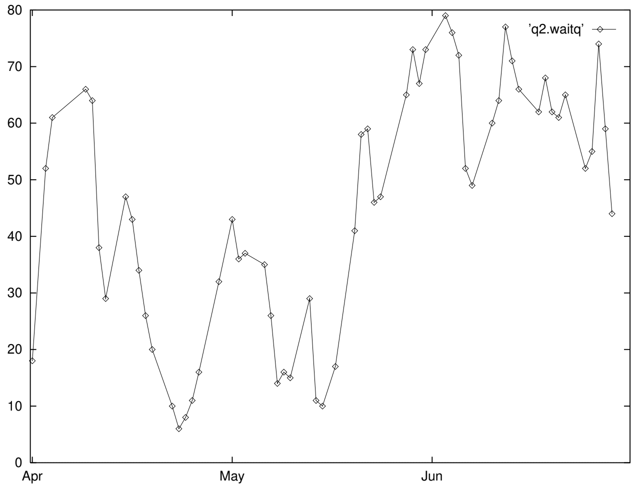
To give an indication of the workload in the hostmaster arena throughout the quarter, one can view the following graph in which we show the number of incoming messages to <hostmaster@ripe.net> per day during Q2-1996.



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 Q2-1996. 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. 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 have continued to track the Registration Services workload, and started collecting information about the nature and frequency of different types of requests being submitted. This workload data was collated and a short report was presented by an MBA student as part of his study in a usage based charging model. Thereby we were able to quantify how much work we perform in different areas, to identify the most effective task areas for further automation, and draw staffing conclusions. This short report can be found at Appendix B.

3.2.4. Policies and Procedure Documentation

An updated version of ripe-104 the "European Internet Registry: IP Address Space Assignment Procedures" was published as ripe-136 "European Internet Registry: Policies and Procedures". Also the "European IP Address Space Request Form" (ripe-137) and the accompanying "Supporting Notes for the European IP Address Space Request Form" (ripe-138) have been updated and obsolete ripe-128 and ripe-129.

3.2.5. Last Resort Registries

It has been decided by the Contributors Committee to only provide service to contributing Local Registries. This means that most Last Resort registries will have to be closed if they don't decide to continue their service and contribute to the RIPE NCC. At the end of Q2-1996 2 LIR's have comitted to continue their service and another 10 have been closed. The remaining 15 Last Resort registries do not receive service anymore and an effort will be made to formally close them as soon as possible. This involves updating the records on all sites and often the return of address space and reverse delgation.

3.3. Services for New Registries

As detailed in Section 3.2.2, 57 new local IRs started operations during Q2-1996. 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 Q2-1996, we delivered 3 Training Courses for Local IRs, namely:

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

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.

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.

3.4. The RIPE Network Management Database

One of the key services provided by the RIPE NCC is the maintenance of the RIPE database software. In this section we report on progress made in this area during Q2-1996, as well as a number of interesting database statistics gathered on June 30, 1996.

3.4.1. Recent Progress

During Q2-1996, development continued in the preparation of the 2.0 release of the database software, planned for Q3-1996.

The most important work which took place during the second quarter was the implementation of the hierarchical authorisation mechanism for the inetnum and domain database objects.

3.4.2. Usage statistics

In the following table we show the number of entries for the different objects maintained in the RIPE database at the end of Q2-1996.

RIPE Database Object	Number
as-macro	85
aut-num	802
community	7
domain	41761
dom-prefix	6
inetnum	52047
inet-rtr	99
limerick	10
mntner	646
person	76347
route	12948
TOTAL	184758

During Q2-1996, 2,721,150 queries were received by the NCC whois server.

3.5. 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.

3.5.1. RIPE-24

The 24rd RIPE meeting was held April 22nd-24th 1996 in Berlin. There were 130 attendees. The minutes of the meeting are available from

ftp://ftp.ripe.net/ripe/minutes/ripe-m-24.txt
ftp://ftp.ripe.net/ripe/minutes/ripe-m-24.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-m24-david-DB-REPORT.ps.gz
ftp://ftp.ripe.net/ripe/presentations/ripe-m24-mir-RS-REPORT.ps.gz

3.5.2. RIPE-25

Preparations are underway for the 25th RIPE meeting to be held September 23rd-25th 1996 in Amsterdam. Up-to-date information can be found at the URL

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

4. RIPE NCC Staffing

As planned in Q1-1996 two new hostmasters, Paula Caslav and Lee Wilmot, started work in this quarter. Since these hiring were direct replacements for the two hostmasters who left in Q1-1996 they do not effect operations at the RIPE NCC. A detailed organisational structure was published in the Q1-1996 report (ripe-135) and remains unchanged.

4.1. NCC Staff Planning

The staffing plans outlined in the Q1-1996 report were pursued in quarter 2 but without a great deal of success in finding suitable candidates. In quarter 3 different avenues will be pursued and the tempo will be upped in a determined effort to achieve the laid down plans.

5. Financial Summary

This financial summary will follow the format presented in the quarter 1 report. At present we are restricted by the data that can be gathered from our administrative system but once this is revised more detail and depth of reporting will be possible and will be carried out. It should also be noted that if comparisons are made between this quarterly report and the TERENA half yearly report then apparent discrepancies will be found. In truth there are no discrepancies but only differences in reporting procedures. This quarterly report follows the RIPE NCC tradition of reporting with the assumption that the period end is the end of the financial year, whereas TERENA reports assume that the period end is the end of the respective quarter. This difference will manifest itself by TERENA only reporting the income received for those services already given whereas this report includes income received for services yet to come in the financial year.

5.1. Quarter Summary: Q2-1996

At the start of Q2-1996, there were a total of 368 local Internet registries in the RIPE NCC service area. Now there are 421, and given that another four last resort registries have closed shop during this time, we've had a total of 57 new local IRs starting operations during Q2-1996.

The expenditure budget for 1996 approved by the RIPE NCC contributors committee in September 1995 is 916 kECU. At the end of Q2-1996 a total of kECU 385 had been expended, equated to 42% of the budget. It is to be expected that expenditure in the first half of the year will be less than the second half since the planned expansion will cost proportionately more money. It should be noted though that the computer and travel expenditure was slightly higher than forecast and these individual budgets may need to be amended in Q3-1996.

At the end of Q2-1996, had commitments for 904 kECU of revenue, which is 99% of the expenditure budget. At this point kECU 761 has been received. Therefore, 83% of the currently planned yearly expenditure has been received in the second quarter. This all results in the NCC having a very healthy liquidity situation.

A project was also started in Q2-1996 to look at the possibilities of a usage based charging system. This project is being performed by two MBA students. The results of this report will be ready by the beginning of Q3-1996 and will form the based of the 1997 revenue and charging document.

If the growth in the number of IRs continues at its present pace, our income for services performed in 1996 will exceed 1500 kECU and thus be 60% above currently planned expenditure. Of course this increase in demand will also require additional resources. Should this trend continue in Q3-1996 we will compile a revised budget to cope with it.

6. Q3-1996

6.1. Efforts and Expectations

Local IR Training

Without exception all local IR courses are immediately filled up. To try and better cater for this high demand we are increasing the number of scheduled courses in Q3-1996 to six. These are listed in the table below.

Q3-1996 Trainings	
July 8, 1996	Milan
July 19, 1996	Geneva
August 9, 1996	Amsterdam
August 30, 1996	Prague
September 16, 1996	Vienna
September 28, 1996	Amsterdam

If possible, additional trainings in Q3-1996 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 Q4-1996 will be announced to the local IR mailing list as usual.

RIPE Database Developments

We will continue a concerted effort to complete version 2.0 of the database software, and will release the software during Q3-1996. After the release future RIPE database developments will be assessed and prioritised.

Documentation

Both the "1997 Activities and Expenditure Plan" and the "1997 Revenue and Charging Model" will be completed in Q3-1996. These documents will then be presented to the contributors, at the contributors meeting on 11 September 1996, for their approval. The "Revenue and Charging Model" will contain several possibilities from which the contributors will have to choose the most suitable.

Allocation Statistics

In response to a request made in Q1-1996 we will, in Q3-1996, publish a list of individual allocation statistics. This will be published on the ripe ftp site.

Staff Hiring

During Q3-1996 we hope, in accordance with the staffing plan, to hire four new staff members, with the following job titles:

- 2 Hostmasters (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)

Appendix A: Hostcount TLD's

The set of DNS Top Level Domains contributing to the hostcount statistics 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	

Appendix B: Registration Services Project

During the Q2-1996 an MBA student started conducting a study into a usage based pricing system for RIPE NCC. As a part of this study the activities and work practices of the Registration Services department were analysed. The results of this analysis give a valuable insight into the percentage of time spent on various activities and show the relationship between Registration Services' present workload and capacity. Based upon these new insights we have been able to draw three points for future operations.

Whenever messages come into <hostmaster@ripe.net> they are categorised according to which of the eleven possible activities they relate. Therefore the number of times that a certain activity is done per day can be readily seen. A part of the study was to determine the average time that it took to complete each individual activity through the use of activity flowcharting. By combining this average time data with the activity frequency data it was possible to ascertain how much time should have been spent, per day, dealing with the messages that came into Hostmaster. It was noteworthy that Assignment Window Exceeded requests are by a sizeable margin the most time consuming activity performed. IN-ADDR also occupies a large amount of the working hours.

Obviously no week is exactly the same as the previous one, thus in order to gain a more in-depth look at the weekly workload of Registration Services, information was gathered concerning the number of hours per week that were totally dedicated to these eleven activities.
From this information it was concluded that at the beginning of the second quarter the average number of hours per week that needed to be spent on the eleven activities was 80, but at the end of the quarter it has risen sharply to an average of 110 hours. With present staffing levels for the department of one manager and 4.6 fte hostmasters it is possible to dedicate an average of 85 hours per week to eleven core activities. An average fte hostmaster will dedicate 18.5 hours per week to these activities. From figure (capacity chart) it can be readily seen that with the rare odd exception the department has been receiving a workload that is in excess of its present 85 hour capacity. This growing gap between workload and capacity has led to the inevitable increase in wait time that the requests are experiencing. The present shortfall between workload and capacity is 25 hours per week which is equivalent to 1.4 fte employees.

From the information provided by this study into the Registration Services department we have arrived at three ways of improving service and cutting costs. Firstly the activity flowcharting that was carried out has added more insight into the operational flow and has further highlighted areas that would benefit from a higher degree of automation. Therefore based upon the extra insight we plan to refine our automation program. Secondly since the Assignment Window Exceeded activity occupies such a large amount of work time we are looking at ways to minimise this. Thirdly since it has been shown that there is a definite discrepancy between the present workload and capacity of the registration department we need to hire two extra fte hostmasters. This would allow the increasing wait times to be attacked, thus improving service. As growth of RIPE NCC continues, and the workload proportionally increases, the situation of the Registration Services department with regard to staffing will have to be kept under review.