RIPE NCC Activities & Expenditure 1996

Daniel Karrenberg
RIPE NCC

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Scope

This memorandum describes the RIPE NCC activities and associated expenditure for the year 1996. The companion document "RIPE NCC Revenue & Charging 1996" describes ways to generate the necessary revenue.

The *RIPE NCC Activity Plan* (ripe-125) defines the activities of the RIPE NCC desired by the RIPE community. Based on that document in this memorandum the RIPE NCC manager describes the activities which the NCC will be able to carry out in 1996 and specifies the resources needed. The NCC Contributors Committee then produces compulsory advice to TERENA about the activities they wish to see carried out and the resources they will commit for this as per point 3.2 of the committee's terms of reference.

1. Workload & Challenges

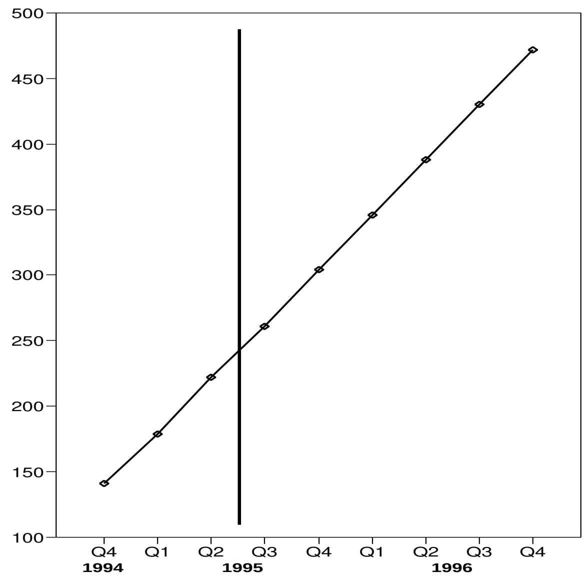
The bulk of resources expended by the RIPE NCC is proportional to the number of local Internet Registries which in turn is mostly equivalent to the number of serious Internet service providers. Consequently any estimate of the resources needed has to start from a prediction of the number of local registries. This number has been growing steadily ever since the NCC has started operations.

Recently the growth rate has considerably increased. In Q1/95, after the introduction of the current charging scheme, a sharp increase in the number of local IRs was observed. This trend continued in Q2/95 and still continues to this day. For details see the report on the 1995 revenue situation.

The table below gives an overview of the observed and expected number of registries:

Registries	Observed			Expected					
	Q4 94	Q1 95	Q2 95	Q3 95	Q4 95	Q1 96	Q2 96	Q3 96	Q4 96
Large ISP	17	17	19	20	22	24	26	28	30
Medium ISP	28	31	35	38	42	46	50	54	58
Small ISP	51	84	119	153	188	222	256	290	324
Enterprise	14	15	17	18	20	22	24	26	28
Last Resort	31	32	32	32	32	32	32	32	32
TOTAL	**141**	**179**	**222**	**261**	**304**	**346**	**388**	**430**	**472**

The figure below illustrates that we expect the total number of registries is expected to grow linearily during 1996:



The almost linear prediction looks very simple at first glance. Some other indicators predict more than linear growth while others predict slightly less than linear growth. These numbers represent the best possible estimates the RIPE NCC is able produce. We now have mechanisms in place to detect deviations from expected figures very quickly and take necessary actions.

Challenges

Given the increased growth rates and the current staffing situation there are two main challenges for the year 1996 are

- Consolidation of Registration Services
- Re-Start of Other Activities.

Registration services are the most critical services the NCC provides. They are critical both in terms of response time and of quality. Quality is mainly measured in the degree of fairness and transparency of decisions as well as the support of the local IRs, the customers.

With the high growth rate of requests and the increasing number of players, registration services are undergoing a major transition and will continue this process through much of 1996. The major aspects of this are similar to the issues currently faced by ISPs:

Increasing Division of Work
: During 1996 we will reach a total of 9 persons spending the majority of their time on registration services, compared to three persons at this stage. This necessitates a total revision of how this work is organised.

Hierarchical Organisation
: We will introduce a much clearer division of senior vs junior and second-line vs first-line support.

Dedicated Person per Customer
: The first-line support persons will have their own set of customers, so that each customer normally deals with only one person at the NCC.

Request Tracking
: The flow of requests among this many people necessitates other queueing and tracking mechanisms than electronic mailboxes. Several request tracking (trouble ticketing) systems have been evaluated. Ticketing and message lookup by ticket number is already implemented. Request tracking will be added as soon as practical.

Resource Accounting

Together with request tracking we will get much more detailed insight in how resources are being used in registration services. We will develop these data to detect problems and further optimise registration services. We will also investigate how this can be used for charging purposes.

Documentation and Training

With the increasing number of customers, training and documentation are increasingly important. We have already started specific training courses about registration services for both new and established customers. This will continue together with improvements in documentation.

Due to the high growth rate in registration services and critical staffing situation the other NCC activities have been suffering badly. Some of these activities are quite important to the European Internet community and have to be continued or even intensifies. Furthermore it is important that the NCC keeps doing other work than registration services in order to keep highly qualified people interested to work here. Therefore other activities have to be (re-) started during 1996 with enough resources to produce useful results.

2. 1996 Activities & Expenditure

Normally it is desirable to propose several alternative packages of activities at this stage in the decision process. However due to the critical staffing situation and the continually high growth rate this is quite impossible for 1996. The resource shortage in 1994/5 combined with the increased growth of the Internet severely limit the degrees of freedom to develop alternatives. Consequently I propose only one set of activities together with the appropriate budget.

The table below gives an overview of the proposed activities and the associated expenditure. The following sections will detail all activities according to the *RIPE NCC Activity Plan* ripe-125.

	1995 revised	%	**1996**	%	delta
Registration Services	358	68	**556**	61	198
Other Services	71	13	**162**	18	91
Admin & Reporting	78	15	**138**	15	60
New Activities	22	4	**60**	6	38
TOTAL (kECU)	**529**	100	**916**	100	**387**

Registration Services

The *Registration Services* budget line represents the basic NCC activities related to the NCC being a Regional Internet Registry, such as handling of incoming requests for address space, assignment and allocation of the address space and the coordination with organisations such as other regional Internet registries and IANA. Also included in this budget line are the activities related to the support and the training required to secure a proper start out of new registries, which will eventually lead to a reduction of the load on the RIPE-NCC. In relation to the Activity Plan these are 3.1, 3.2, 3.4, 3.8, and half of 4.1.

The high absolute growth in *Registration Services* represents more personnel being hired for these activities as well as some external contracts to produce documentation and training material. Note that the majority of the increase due to the catch-up programme being performed in the second half of 1995 as per the revised expenditure plan reported elsewhere. This increases the budget lines in 1996 because the salaries are budgeted for only part of the year in 1995. Real growth in personnel in 1996 thus is less than it may appear at first sight. I do not propose linear growth with workload.

Assuming unchanged workload growth patterns 1996 will see a consolidation followed by very modest growth in 1997. At the same time note that the relative size of *Registration Services* decreases slightly in relation to the other activities.

Other Activities

The *Other Activities* line encompasses all activities which are not part of the other three categories. These are the technical activities not related to registration services or new activities. In particular the maintenance of the Routing Registry as well as other tools developed at the RIPE-NCC, such as PRIDE, the update of the Database management tools, and the maintenance of RIPE related documents and meetings organisation. For details see the following sections.

This budget line increases significantly in absolute terms. These activities have been neglected during the past resource shortages. Those in the most dire need of attention will be progressed again.

The budget line also increases slightly relatively to the others. This does not so much reflect a change in policy but rather the fact that not enough resources were available in the previous period, causing a shift towards *Registration Services*.

Administration and Reporting

The *Administration & Reporting* budget line represents activities 6.1-6.4 of the activity plan, as well as the formal procedures concerned with billing and invoicing.

This lines increases in absolute terms because the resources necessary for regular reporting will be available again. Also the effort involved in charging and billing has turned out to be considerable even with the current relatively simple charging model.

Note: The constant relative size of this category is slightly misleading because of a budgeting change. In 1995 this category was bearing the full cost of NCC computer system administration. This cost is now being divided over all activities because the systems are obviously not being used just for *Administration & Reporting*.

It is important to note that this figure assumes a charging scheme for 1996 which is very simple. More involved charging schemes will add significantly to the resources necessary in this category.

New Activities

The *New Activities* line represents the participation in special projects approved by the RIPE community and the NCC contributors, as defined in the RIPE-NCC activity plan (4.4).

The currently planned activities are related to IPv6 tracking and testing. This represents roughly 50% of the planned expenditure. The remaining 50% are reserved for necessary activities arising during 1996. Note that this is less than one third of the ceiling set by ripe-125.

Support for New Registries

The expenditure proposed on activities specifically for new registries is ECU 172k all of which is in the *Registration Services* category.

Reserves

Although building reserves is not expenditure, the buildup of prudent reserves should continue in 1996. This is necessary because TERENA has to avoid liability for NCC operations as much as possible. As the size of the NCC and the commercial and strategic impact of its services increase, liabilities and the need for stability increase as well.

Summary

The proposed set of activities strikes a balance between what is desired by the community and what can be achieved by the NCC considering the necessary growth, while maintaining a reasonable level of cost at the same time.

The main challenges for 1996 are re-structuring and consolidation of registration services as well as re-start of other important activities.

The total increase in expenditure compared to the revised 1995 budget is 73% while the number of customers rises by 55% at the same time. The high total growth is a consequence of the catch-up operation in progress and mainly due to the additional staff hired during 1995. Their salaries show in 1996 for the first whole business year.

Assuming no major changes in workload by the end of 1996 the RIPE NCC will have reached a stable state producing a high level of standard services while still being capable of starting new activities as needed in the changing Internet environment. Further growth of the NCC is expected to be moderate in 1997 and beyond.

Activities in Detail

The remaining sections of this document detail the planned activities according to the *RIPE NCC Activity Plan* (ripe-125). The numbering scheme corresponds to ripe-125 and significant parts of the activity descriptions have been included.

3. Technical - Coordination Activities

3.1. Internet Registry for Europe

The RIPE NCC will will act as the European registry for the delegation of Internet numbers. The RIPE NCC will perform this function in close cooperation and coordination with

a. The Internet Assigned Numbers Authority (IANA)

b. The global Internet Registry (currently the Internic)

c. Local Registries of European service providers.

In exceptional cases the NCC can act as the Registry of last resort for European organisations.

This activity will be resourced sufficiently to achieve the high service level available traditionally with the goal of processing fully documented address space allocation and assignment requests within a maximum of two working days. The personnel resources available at full deployment will total some 200 hours per week.

In addition to that this activity includes the maintenance of local IR training material and the delivery of courses for new and established local IRs. Some of this work such as technical writing will be contracted out.

3.2. Maintain a database of European IP networks and their management information.

The database to be maintained will contain several classes of objects. These objects are described in detail in ripe-13. The NCC will be responsible for the database entries; this includes

a. collection of database entries

b. checking of individual entries

c. checking of consistency and integrity of the database.

Quarterly reports on changes in the contents of the database will be produced, together with statistics about the number of database entries.

This activity will have its resources increased sufficiently to resume the necessary maintenance work (b and c above). It will be executed by registration services staff and thus form a buffer activity which can be expanded and contracted according to the immediate needs of activity 3.1.

3.3. Distribution of the database.

Secondary copies of the database can be installed at other sites upon request. It is the responsibility of the NCC to keep track of such secondaries. The RIPE NCC will provide assistance to local registries in setting up secondary database servers. An up to date record of secondary sites will be maintained on line.

The database availability is currently excellent. This activity is not urgently needed. No resources are allocated for it. However, should the need arise it can be started up quickly because the necessary technology will be enhanced in activity 4.1 and used by activity 3.4.

3.4. Coordination of database exchange with other organisations.

The NCC will coordinate and execute the exchange of database information with NCC's outside Europe. The result will be that for the end user of the database one uniform set of global information will be available.

This activity has seen almost no progress other than in the Routing Registry part of the database where little resources are needed to exchange information. In other areas of the database there was no progress at all in 1995. In 1996 this will be started again with emphasis on registration data exchange with the InterNIC. The possibilities of RWhois and whois++ will be explored. The activity has 12 engineer-hours per week allocated.

3.5. Keep a record of operational contact points.

This will consist of a list of NOC's and responsible people that will be used as a reference list for the individual NOC's to be used in case of network related incidents, including security incidents. Individual NOC's will be able to subscribe to a weekly update service.

The database and self-maintained (majordomo) mailing lists at the NCC have proven sufficient for this activity. No resources are allocated in 1996.

3.6. Placement of name servers and backup servers in Europe, and beyond.

On a regular basis the interworking between the DNS name servers in Europe, and their connections to name servers outside Europe, must be checked. Detected errors and inconsistencies must be reported. Corrective actions must be followed in case of severe problems. The result will be a consistent set of name servers.

This activity has not consumed resources in 1995. No resources will be allocated for 1996. However, the RIPE NCC will continue to monitor the DNS and react to requests from RIPE if necessary and if resources are available.

3.7. Referral Service.

The RIPE NCC will perform a Referral Service for Internet Service providers. The NCC will do this in a fair and impartial way. The service is only available to service providers contributing to RIPE NCC funding.

This activity has 4 hours/week of administrative staff time allocated to it, which is sufficient given the high degree of automation used for this activity.

3.8. Coordination with Local Registries.

The RIPE NCC will keep close contact with Local Registries in Europe. The RIPE NCC will assist such registries in setting up and maintaining their services. This activity may include presentations on the work of the RIPE NCC for broader audiences, such as relevant conferences and workshops. It may also include coordinated development of common tools.

The first part of this activity is indistinguishable from activity 3.1. Nominal resources will be allocated to the second part.

3.9. Routing Registry Maintenance

The RIPE NCC will maintain the RIPE Routing Registry according to the relevant RIPE documents. It will encourage European service providers to use the RR and support them in doing so. The NCC will actively work with service providers to minimise gaps in coverage. It will provide training and report on the status of the registry. The NCC will coordinate with other RRs to achieve Internet wide RR coverage. The RIPE NCC will identify and propose needed extensions to the RR.

This activity will be stepped up significantly in 1996 to 20 hours/week of engineering time. This is expected to be sufficient to do significant work in extending coverage and awareness as well as keeping the quality of registered data at a high level.

3.10. PRIDE Tool Maintenance

The RIPE NCC will maintain the Routing Registry Tools developed by the PRIDE project. This activity does not cover development of new tools or significant new features. The RIPE NCC will identify and propose needed extensions to the tools.

While this activity is highly desirable, it is impossible to do significant work on this in the current situation. It is expected that others such as the US Routing Arbiter project will take the lead in this activity. 12 hours/week engineering time should be sufficient to track and influence other activities. Once the NCC stabilises in 1996 separate funds could be raised to step up this activity.

4. Technical - Development Activities

4.1. Database management tools.

Tools for management of the database and their maintenance are an important work item for the NCC. The result will be the availability of a consistent database.

This activity is important to the functioning of the NCC and will be done with 20 hours/week engineering time. A prioritised work plan has been presented to the RIPE DB working group. This plan will be executed with the current priority items being completed in 1996.

4.2. Database querying tools.

Development and maintenance of the whois utility. The result will be a program, available from a file server, that permits remote interrogation of the database.

Tools are available. Only nominal effort is foreseen for maintenance in this area. No new developments.

4.3. DNS quality control tools.

Utilities for quality control of the interworking of the DNS name servers will be developed and maintained. The result will be a set of software and documentation, available from a server.

Both tools and regular output of them are available. Only nominal effort is foreseen for maintenance in this area. No new developments.

4.4. Special projects.

The RIPE NCC can participate in special projects that have been approved by at least the RIPE community. The nature of the participation can be administrative, managerial or technical. The total amount of NCC participation should not exceed 20% of the NCC resources. Results of the special projects will be publicly available.

24 hours/week engineering time will be allocated for this. The currently planned activities are related to IPv6 tracking and testing. This represents roughly 50% of the planned resources. The remaining 50% are reserved for necessary activities arising during 1996.

5. Administrative - RIPE Activity Support

5.1. Keeping the RIPE document store.

The NCC will keep RIPE documents on line and easily accessible to the RIPE community. Copies of other document stores relevant to the RIPE community, such as the repository of RFCs, will equally be provided. Modern document retrieval utilities will be installed and maintained to facilitate access to the document store.

This activity has received almost no attention in 1995, resulting in the need for better maintainability as well as for revision of the server software and rehoming to a newer platform. Significant staff time and some external consultancy will be used to make the document store more useful and easier to navigate. The main emphasis will be on useful information for NCC customers and will concentrate on access via WWW.

5.2. Technical and secretarial support for studies undertaken by RIPE.

The NCC will provide technical and clerical support for RIPE studies and working groups in order to enhance continuity and coordination of the work between RIPE meetings.

No resources will be allocated to this activity in 1996

5.3. Organisational support for RIPE meetings.

RIPE meeting attendance is expected to be on the order of 80 persons, meeting three times a year. The NCC will provide clerical support to organise these meetings in order to keep them productive.

The current level of resources is about 6 hours/week of staff time which will be maintained in 1996. Most of this time goes into organisation of the one meeting outside Amsterdam while the meetings in Amsterdam take comparatively little resources.

6. Administrative - Reporting

6.1. Quarterly Activity Reports

Quarterly reports an all activities will be produced for the RIPE participating organisations and the RIPE NCC funding organisations.

This activity has had almost no resources allocated in 1995 due to the staff shortage. Keeping operations going is considered more important than reporting. In 1996 sufficient resources will be allocated to resume formal quarterly reporting.

6.2. Quarterly Problem Reports

Quarterly reports on outstanding problems will be produced for the RIPE participating organisations and the RIPE NCC funding organisations.

See above.

6.3. RIPE Meeting Reports

The NCC reports on its ongoing work and outstanding problems also to each RIPE meeting. These meetings currently take place three times a year.

These reports have been delivered even in 1995. Sufficient resources will be allocated to continue them in 1996.

6.4. Annual Reports

The NCC will produce annual reports.
The annual report will contain a summary of the activities and an overview of the financial situation.

Sufficient resources will be allocated to prepare the 1996 annual report.