



Member Update

Information bulletin for the members of the RIPE Network Coordination Centre

August 2003

www.ripe.net

Introduction to the new RIPE NCC Services Working Group

by the Chair, Kurt Lindqvist

The RIPE NCC Member Update is intended for LIR contacts.

If you are not the right person to receive this update, please forward it to the appropriate colleague.

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Registration Services

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Training Courses

<training@ripe.net>

Become a Member

<new-lir@ripe.net>

Billing Department

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Whois Database

<ripe-dbm@ripe.net>

RIPE Meeting

<meeting@ripe.net>

Feedback

<feedback@ripe.net>

After the KPMG survey, presented at RIPE 44, the RIPE NCC felt that it was necessary to separate discussion of RIPE NCC's services from the RIPE community's IP address and AS Number policy discussions in the Local Internet Registries Working Group (LIR WG). This would allow the LIR WG to concentrate on updating addressing policies and to discuss issues around this area. It would also enable a new working group to address the increased transparency of the RIPE NCC and its activities, which was one of the member wishes that came out of the KPMG survey.

During the latest RIPE Meeting in Barcelona, this proposal was put forward and discussed. This suggestion was generally well received and the split of the LIR WG was tentatively approved.

I was asked by a number of people to volunteer to chair the new working group. Before accepting, I discussed with various people in the RIPE community if they felt that going with the new

working group was a good thing, and if they thought that I would have something to contribute. Based on these discussions I decided to volunteer as the future chair of the RIPE NCC Services Working Group.

From the beginning I realised that people seem to have many different views on what this split might mean and what the tasks for this new working group might be. Clarification of this will, of course, be part of the charter that has to be written. But when asked to write this article, I thought it might offer a good opportunity to express my personal views and to start the debate.

The first point is that the WG charter needs to be written and I will not do this myself. At the Barcelona meeting people were encouraged to contact me if they wanted to be part of writing the charter. There has been very little feedback on this. But I am grateful to those who have volunteered to help.

As for what this group is, and what it isn't, I think the first

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Changes to RIPE Working Groups

There were several changes to RIPE Working Groups announced at RIPE 45.

After a proposal by Rob Blokzijl, RIPE Chair, the RIPE Working Group Chairs agreed to merge the next DNS Working Group and DNR Forum sessions at RIPE 46.

The NetNews Working Group was deactivated, although the mailing list remains active. The Tools Working Group was also deactivated, with all discussions on the activities and services of the RIPE NCC incorporated into the new RIPE NCC Services Working Group.

As decided by the RIPE community at RIPE 45, the LIR Working Group has been split into two working groups. Issues involved with address policy-making

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The RIPE NCC 2002 Annual Report has been published and mailed to all members. The report is also available online at: <http://www.ripe.net/annual-report>

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This publication is available online at:

<http://www.ripe.net/newsletter>

The mission of the RIPE NCC is to perform activities for the benefit of the membership; primarily activities that the members need to organise as a group, although they may compete with each other in other areas.

Introduction to the new RIPE NCC Services Working Group

by the Chair, Kurt Lindqvist

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point that needs to be stressed is that the new working group is not a replacement for the RIPE NCC's annual General Meeting (GM). The budget of the RIPE NCC and other financial issues need to be discussed and approved at the GM. I hope that, with the current plans for making the GM more accessible to the general membership, many of these discussions will be moved to the GM, where they should be.

I think the new working group is the platform to discuss future activities and a much more open (dare I say creative?) forum to discuss and debate the activities and services of the RIPE NCC, its performance and the expectations of its members. This said, I also think that we need to keep in mind that new activities will lead to increased costs to the membership, just as declined or cancelled projects might lead to poorer or missing services, or a slower development of common services for the RIPE region.

I would also more than welcome the RIPE NCC management to use the RIPE NCC Services Working Group as a reporting forum for costs associated with any new activities or services proposed by the community. What might be a problem (or not) is that the forum is open to anyone, not just RIPE NCC members. What the working group is not in this respect is a forum for trying to micromanage the RIPE NCC. The RIPE NCC is governed by an executive board that is elected through the annual GM. If members think there are issues, the annual GM is where they should raise them.

Lastly, where do I, as a RIPE community member, think the RIPE NCC should be heading? I am not taking this opportunity to have a one-way debate. I just think that with the chair role, I need to be clear on what my views are from the start. I do not want these to colour the views of what the working group is doing. I think that the RIPE NCC has historically been hurt by a number of

things: the previous poor (real or perceived) performance of Registration Services; the hard to penetrate, lengthy and sometimes ambiguous RIPE document series (although some of these documents have often been written by the community); and the RIPE NCC financial statements. These things have all hurt the RIPE NCC in the eyes of the membership and the non-membership. This most certainly includes me.

The general economy and the Internet industry in particular have taken a long downturn, and this has most likely added to the problems. I happen to think that much of what the RIPE NCC does is useful and of general benefit to the Internet industry in the RIPE region. I might agree with those that say that some activities are not really related to what the RIPE NCC should be doing and that these activities might have been a distraction from providing the RIPE NCC core services. The problem, as I see it, is that these activities are also important, and we don't currently have a better place for them.

At the same time, I see most (well, that might be exaggerating a bit, but I guess it's not that far off) of the RIPE NCC membership struggling to pay salaries to their employees. To them this is more important than getting additional services and projects from the RIPE NCC. This is, however, the balancing act that the RIPE NCC needs to perform and that we, as a membership, need to help them with. And this is what the RIPE NCC Services Working group is there for.

Come and join the discussions by subscribing at:

<http://www.ripe.net/mailman/listinfo/ncc-services-wg>

I hope that I have managed to provoke some discussion and given some leads on the areas I think we need to discuss.

Kurtis Lindqvist

<kurtis@kurtis.pp.se>

Changes to RIPE Working Groups

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in the RIPE region will move to the Address Policy Working Group. Discussions about RIPE NCC activities and services will take place in the RIPE NCC Services Working Group.

It was proposed that splitting the LIR Working Group into two groups would help keep discussion of RIPE community's IP address and AS Number policies separate from discussion of the RIPE NCC's activities and services.

The Address Policy Working Group will focus solely on the discussion of Internet resource management and registration. The RIPE NCC Services Working Group will provide a forum for discussing RIPE NCC services and activities. Hans Petter Holen (Tiscali, Norway), Gert Döring (SpaceNet AG) and Andrea Borgato (I.NET S.p.A.) have agreed to chair the Address Policy Working Group. Kurt Lindqvist (Netnod) has agreed to chair the new RIPE NCC Services Working Group.

A charter is being drafted for both working groups and your input in this process is encouraged.

The <lir-wg@ripe.net> mailing list has been replaced by two separate mailing lists. Current subscribers have been automatically transferred to both new mailing lists. The charter for each working group will be raised with the community via these working group mailing lists.

To post a message to the RIPE NCC Services Working Group, send an e-mail to: <ncc-services-wg@ripe.net>. For the Address Policy Working Group send an e-mail to: <address-policy-wg@ripe.net>.

LIR Portal Update

The LIR Portal was updated in May with the additional features detailed below.

Public Key Infrastructure (PKI)

PKI authentication was implemented for the LIR Portal. Users can now login using X.509 certificates.

Long-term plans include using X.509 for authenticating e-mails, Whois object updates and other communication between the RIPE NCC and its members. More details about this project can be found at:

<http://www.ripe.net/ripe/draft-documents/pki-20030429.html>

Allocation Editor

The Allocation Editor allows users to modify a subset of fields in their allocation objects without having to contact a RIPE NCC Hostmaster. Batch modifications to several objects at a time are possible.

More interaction between the LIR Portal and the RIPE Whois Database, using the new PKI infrastructure, is planned.

User Tools

A new section has been added to the LIR Portal grouping new tools with existing tools previously found on the RIPE NCC web site.

Statistics

LIR Portal (January - June 2003):

- LIRs with active accounts: 1560
- User accounts: 2659 (1.7 accounts per LIR)
- User accounts with PKI enabled: 173 (7% of all users)
- Data modifications: 2996 (approx. 500 per month)

Allocation Editor (May - June 2003):

- Updated Whois objects: 416
- Sessions: 224 (1.9 objects modified per session)
- Most frequently modified attributes: admin-c (147), tech-c (140), notify (77)

The Early Registration Transfer (ERX) Project

The RIPE NCC was established as a Regional Internet Registry (RIR) in 1992. However, there were plenty of IP-based networks already operating within the RIPE NCC service region at that time.

Those networks had obtained IP address space and AS Numbers from the InterNIC (Internet Network Information Center) or the IANA (Internet Assigned Numbers Authority). Some of those networks continued to obtain their address space and AS Numbers from the InterNIC after the RIPE NCC's formation.

Most of these resources were registered in the InterNIC's Whois Database. When the InterNIC stopped providing registration services for numbering resources in 1997, the registrations were transferred into the new ARIN Whois Database.

Operators located outside the ARIN service region still needed to use ARIN's systems to maintain contact information and DNS delegations. Many of those operators preferred to use the RIPE Database because it was the interface with which they were most familiar. Unfortunately, this meant that many records appeared in both the ARIN and RIPE Databases.

In 2002, the RIRs began a program to move registrations of non-ARIN networks from ARIN's Database to the database in the region in which they reside.

The first set of records to be transferred was the AS Numbers. The process started in August 2002 and was completed in September 2002.

The next step was to transfer the IPv4 registrations in the former "Class B" address space. This process is ongoing and will take about a year to complete.

The three possible scenarios in a transfer are:

- Records that appear in the ARIN Database but not the RIPE Database
- Records that appear in the RIPE Database but not the ARIN Database
- Records that appear in both databases

As with AS Numbers, all the parties involved are notified by e-mail at the start of the process. Where the record appears in both databases they can advise as to which record is correct and should be left in the RIPE Database following the transfer.

The registrations are transferred /8 by /8. In some cases ARIN will remain the "majority" RIR. That is, most registrations in the /8 will be for ARIN region networks. In other cases, the RIPE NCC will be the "majority" RIR. The "majority" RIR will provide DNS services following the transfer.

One of the most important aspects of the transfer is to ensure that there is no interruption to the DNS service. To ensure this, the "minority" RIR will have a DNS zone "fragment" incorporated into the DNS zone published by the majority RIR.

Once the networks from the old "Class B" space have been transferred, the process will begin for the networks in the old "Class C" space.

More information about the ERX project can be found on our web site at:

<http://www.ripe.net/db/erx>

Questions about specific transfers should be sent to <er-transfer@ripe.net>.

RIPE Database Improvements

The RIPE NCC has been working on restructuring the dbupdate program. This is the part of the RIPE Whois server that processes update requests from users.

The main goal has been to improve the acknowledgement messages that users receive from the RIPE Whois Database and to provide clearer error reporting and authorisation information. The software has also been made easier to maintain and modify. This will reduce the time spent fixing bugs and adding new features. An example of the new acknowledgement messages, with a detailed breakdown and description, can be seen on the web site at:

<http://www.ripe.net/db/dbupdate/acknowledgments.html>

The new acknowledgement messages show detailed authorisation information for each object updated, documenting which maintainer objects were checked. If the update was successful, the maintainers that allowed the update to be authorised correctly are listed. If the update failed, the maintainers for which authorisation is required are listed. If it is a route creation, maintainers for the object itself as well as the parent route/inetnum and the origin aut-num are listed. This should help users to identify where problems exist when updates fail. Further enhancements to the acknowledgement messages include the following:

- A summary of results at the top of the acknowledgement followed by a more detailed report.
- In the detailed report, failed updates appear at the beginning followed by successful updates. Anything not recognised as an object is listed at the end.
- Per-class information messages (allowing results to point the user to more specific help, e.g. IN-ADDR.ARPA help for failed updates on domain objects).
- More accurate recognition of what an “object” is, reducing the number of error messages reported on textual paragraphs within the update message.
- The subject line of an acknowledgement will only state “FAILED” if an error has been found. A “No Operation” or a blank update message will be classed as “SUCCEEDED”.
- Acknowledgement and notification messages use three dashes (- - -) at the start of a line to separate each ‘section’ relating to an object. This should make parsing scripts simpler to write.
- Notifications when updating hierarchical objects are also sent to the appropriate contact of parent objects, including the origin aut-num for routes.

The restructuring of the dbupdate program involved almost a complete re-write of the dbupdate code. Therefore the testbed used for dbupdate was expanded to include comprehensive testing for all features of the program. The testbed is easy to run, and an entire regression test will be run when new features are added. When bugs are discovered, a new test can be quickly added to ensure that the fix was correct.

Another benefit of the new code is that it will be much easier for operators using the RIPE Whois server to adapt the software to match their own requirements. For example, organisations with different rules regarding authorising object updates can now write a plug-in to implement those rules without having to look through any other code. The testbed will also be released with comprehensive documentation allowing custom changes to be tested with the same framework as the RIPE software.

RIPE Meetings

RIPE Meetings are open to anyone. The primary attendees include a variety of individuals from Internet Service Providers (ISPs) and IP network operators predominantly from Europe and surrounding regions. Governments and other Internet industry players are also represented. The meetings address technical and policy issues affecting Internet administration and operations specific to IP networking in the RIPE NCC service region and beyond.

Next RIPE Meeting: RIPE 46

RIPE 46 will take place from 1 – 5 September 2003 at Hotel Krasnapolsky in Amsterdam, the Netherlands. At RIPE 46 there will be various working group sessions of interest to network operators and administrators. For the latest up-to-date information and to register for the upcoming RIPE Meeting please refer to:

<http://www.ripe.net/ripe/meetings/ripe-46>

Upcoming RIPE Meetings

RIPE 46	1 – 5 September 2003	Amsterdam, the Netherlands
RIPE 47	27 – 31 January 2004	Amsterdam, the Netherlands

A New Direction for Measurements at the RIPE NCC

The RIPE NCC has collected data and published statistics about the Internet from its inception. In fact, the DNS Hostcount (<http://www.ripe.net/hostcount>) started in October 1990, a year and a half before the RIPE NCC began operations. Other activities have been added over the years, in particular the Test Traffic Measurements (TTM, <http://www.ripe.net/ttm>) and the Routing Information Service (RIS, <http://www.ripe.net/ris>).

After more than 10 years it is time to revisit this area and adjust the direction based on input from the RIPE community and the RIPE NCC membership. In order to encourage feedback from the community, the topic of data collection and statistics was included in the RIPE NCC membership survey carried out last year. Also, all current users of the 2003 TTM survey were contacted with specific questions about the project. A summary of the responses to the TTM questionnaire can be found in document RIPE 270, "Test Traffic Measurements (TTM) Survey 2002".

Based on the feedback from the community, the RIPE NCC's Chief Scientist, Daniel Karrenberg, published a paper (RIPE 271, "RIPE NCC Hostcount in the 21st Century") that outlined the strategy for measurements at the RIPE NCC in the next four years. The main conclusions of this paper are:

1. Measurements are necessary for RIPE NCC operations, RIPE policy development, long-term planning of ISP operations, addressing concerns from government and industry regulatory bodies, and for various other purposes.
2. The RIPE NCC, with its proven record of neutrality and impartiality, is the place to do these measurements. Moreover, the RIPE NCC staff doing the work over the years has built up a high degree of professionalism and experience in this area. This results in high-quality data that can be widely used.
3. Test results should be made public. Restrictions limiting the use to special groups should be removed.
4. The data collected is often somewhat academic and difficult to use. To address this, the RIPE NCC should develop simple and quick-to-use products based on the data relevant for daily ISP operations. Moreover, documentation relating to the data should be improved and simplified.

This strategy paper was presented and discussed at the RIPE 45 Meeting and was, in general, well received by the attendees.

If approved by members at the RIPE NCC General Meeting, the next step would be to implement the strategy as outlined in RIPE 271. This would be a multi-year effort. In the near future, if the strategy is implemented, you could expect to see changes in the data collection efforts by the RIPE NCC, such as:

- One central entry point on the RIPE web site will be created for all statistics maintained by the RIPE NCC.
- The RIS will be expanded with the "myAS" feature. "myAS" allows LIRs to monitor their prefixes and AS Numbers as they are seen on the Internet. "myAS" will notify them of any unusual occurrences. An alpha version is already available at:

<http://www.ris.ripe.net/cgi-bin/myas/index.cgi>

- The Test Traffic Measurement service will be stopped as a closed user-group service early in 2004. However, active measurements are essential and the infrastructure will continue to be operated for public delay and loss measurements. It will also be used for new measurements such as the DNS Monitoring service, which measures the performance of ccTLD and root servers. A beta version of this service is available at:

<http://dnsmon.ripe.net>

- All other statistics collected by the RIPE NCC will be grouped together with uniform data formats for easier processing and better explanations of how the data can be used in operations.
- Finally, procedures will be established to quickly provide authoritative data about unusual events on the Internet with useful data for LIRs, the Internet community and the general public. An example of this is the analysis of the Sapphire/Slammer worm earlier this year:

<http://www.ripe.net/ttm/worm>

More details about these efforts will be presented in the RIPE NCC Activity Plan 2004, at the RIPE 46 Meeting and, if approved by members, in an implementation document to be published later this year. In order to successfully develop these services, your input and support is very important and you are encouraged to participate in the discussion at the annual General Meeting. Suggestions and ideas can be posted to the <tt-wg@ripe.net> mailing list beforehand.

RIPE NCC General Meeting

The RIPE NCC General Meeting (GM) is the annual meeting for all members of the RIPE NCC. The GM enables the membership to openly discuss the performance of the RIPE NCC and the quality of the services that it provides to its members.

During the GM, the RIPE NCC Executive Board proposes the new RIPE NCC Activity Plan, Budget and Charging Scheme for the coming fiscal year and presents the annual and financial report for the last year to the membership.

The GM also serves to fill any vacancies in the Executive Board. This is done through a majority vote of the members participating in the General Meeting. Members are welcome to nominate individuals to the Executive Board, provided that the nomination is endorsed by at least five other members.

Members are entitled to put additional items on the GM agenda until four weeks before the meeting takes place. Members wishing to put forward an item for the agenda must have the support of at least 2% of the total membership vote.

The RIPE NCC General Meeting has been traditionally held at the end of October each year. However, based on members' requests, the RIPE NCC Executive Board has decided to hold the GM adjacent to the RIPE 46 Meeting, taking place 1 - 5 September in Amsterdam, the Netherlands. As a result, the RIPE NCC expects a higher participation in the GM this year.

The RIPE NCC 2003 General Meeting will be held:

5 September 2003
13:00 -17:00 (CET)
Grand Hotel Krasnapolsky
Amsterdam, the Netherlands

Participation in the GM is only open to members of the RIPE NCC. Members who wish to attend the GM are required to register with the RIPE NCC at least two weeks before the meeting.

Registered members who will attend must also indicate the name of the individual who is entitled to vote on behalf of their organisation. Multiple representatives may attend the meeting, but only one person is allowed to vote.

For members who are unable to attend the GM but would still like to vote, proxy voting is possible. All proxy forms should be sent to the RIPE NCC at least two weeks before the meeting (22 August 2003).

Information about the RIPE NCC General Meeting will be published at:

<http://www.ripe.net/ripenncc/about/gm>

Details about the GM can be found in the RIPE NCC Articles of Association available at:

<http://www.ripe.net/ripe/docs/articles-association.html>

Important Dates for the RIPE NCC 2003 General Meeting:

July 25

- Registration opens

August 8

- Deadline for suggesting agenda points (members must have the support of at least 2% of the total vote)
- Deadline for receiving nominations for the Executive Board vacancies

August 22

- Registration closes
- Deadline for proxy votes

September 5

- RIPE NCC General Meeting 2003

RIPE NCC Activity Plan 2004

As a result of moving the annual RIPE NCC General Meeting to September, adjacent to the RIPE 46 Meeting, the RIPE NCC Activity Plan for 2004 has been published earlier than in previous years.

The format of the RIPE NCC Activity Plan 2004 has also been revised to make it more accessible to members. It is less complex and provides concise focus points summarising the RIPE NCC's proposed activities for 2004. These include:

- Quality of service
- Membership support
- Qualitative and accessible information supply

At a more detailed level the activity plan provides proposals for activities to achieve these focus points.

Additionally, there are two versions of the RIPE NCC's Charging Scheme and Budget proposed for the year 2004 that are presented as separate documents. One reflects proposed changes to the charging scheme and the other maintains the categories of the current charging scheme.

The revised charging scheme is designed to align with membership developments and to provide a more fair reflection of the resources used by each LIR. In addition, the revised charging scheme introduces two new billing categories.

Registered members can vote on the charging schemes and the RIPE NCC Activity Plan for 2004 at the RIPE NCC General Meeting on 5 September 2003.

The RIPE NCC Activity Plan 2004 can be found online at:

<http://www.ripe.net/ripe/draft-documents/ap2004.html>

RIPE NCC Training Courses

LIR Training Courses

Amsterdam/Netherlands
Friday, 22 August 2003

Helsinki/Finland
Thursday, 28 August 2003

Oslo/Norway
Friday, 12 September 2003

Munich/Germany
Friday, 19 September 2003

St. Petersburg/Russia
Friday, 26 September 2003

Dublin/Ireland
Friday, 3 October 2003

Istanbul/Turkey
Thursday, 9 October 2003

Geneva/Switzerland
Monday, 20 October 2003

Amsterdam/Netherlands
Friday, 24 October 2003

Rome/Italy
Monday, 27 October 2003

Copenhagen/Denmark
Monday, 3 November 2003

Paris/France
Thursday, 13 November 2003

Amsterdam/Netherlands
Friday, 21 November 2003

Moscow/Russia
Thursday, 27 November 2003

Cologne/Germany
Friday, 5 December 2003

Lisbon/Portugal
Thursday, 11 December 2003

Amsterdam/Netherlands
Friday, 19 December 2003

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Proposed Changes to the RIPE NCC Articles of Association

As a result of the members and stakeholders survey conducted in 2002, the RIPE NCC Executive Board has recently supported changes to increase the interaction between the RIPE NCC and its members and stakeholders. The purpose of these changes, such as rescheduling the General Meeting (GM) and introducing the RIPE NCC Services Working Group, is to increase the community's ability to offer feedback on the activities and services of the RIPE NCC.

The Executive Board has also proposed changes to the RIPE NCC Articles of Association that would give the RIPE NCC greater operational flexibility. This would allow the Executive Board to respond to industry changes during the business year by making budgetary or activity adjustments, and reducing the operational dependency on the once-per-year General Meeting.

While the proposed changes would give the Executive Board more authority over the association's activities and budget, the membership fees and Charging Scheme would still need to be approved by the membership at the GM.

Some of these changes require changes to the RIPE NCC Articles of Association. A summary of these proposed changes can be found at:

<http://www.ripe.net/ripe/draft-documents/aoa-change-summary.html>

The proposed new Articles of Association can be found at:

<http://www.ripe.net/ripe/draft-documents/articles-association-2003.html>

RIPE Meeting Service Additions

The RIPE 45 Meeting in Barcelona saw two new additions to the RIPE Meeting services: "ROSIE" and live webcast.

ROSIE (RIPE On Site Information Exchange) provides up-to-date meeting information and resources to RIPE Meeting attendees. This ensures important information is readily available and makes the meetings more productive.

Information on ROSIE includes: meeting plan and agendas, important announcements, information about the Hostmaster Consultation Centre and a list of RIPE NCC staff and board members attending the meeting. With each subsequent meeting more features will be added to ROSIE.

In order to increase community awareness and involvement in the RIPE Meetings and to promote openness, we conducted the first live RIPE Meeting technical webcast trial of the plenary sessions.

There were approximately 700 distinct visitors to the live webcastings with a total of 3500 successful hits. Although visitors originated mainly from Europe, hits were also recorded from the U.S., Australia, Brazil and Cuba.

The RIPE NCC would like to thank ICANN, SURFnet and the NRNs (National Research Networks) for their support in enabling the success of the webcasting trial.

The archives of the webcasts are available at:

<http://www.ripe.net/ripe/meetings/ripe-45/webcast-archive.html>

Routing Registry Training Courses

Helsinki/Finland
Thursday, 29 August 2003

Amsterdam/Netherlands
Monday, 8 September 2003

Geneva/Switzerland
Tuesday, 21 October 2003

Rome/Italy
Tuesday, 28 October 2003

Paris/France
Friday, 14 November 2003

Lisbon/Portugal
Friday, 12 December 2003

DNSSEC Training Courses

Amsterdam/Netherlands
Friday, 19 September 2003

Istanbul/Turkey
Friday, 10 October 2003

Moscow/Russia
Friday, 28 November 2003

More information about training and course material is available at:

<http://www.ripe.net/training>

Conferences and events in 2003 that might be of interest to RIPE NCC members:

August

SIGCOMM 2003 • Karlsruhe/Germany
<http://www.acm.org/sigs/sigcomm/sigcomm2003/> • Monday, 25 August - Friday, 29 August

APNIC 16 • Seoul/South Korea
<http://www.apnic.net/meetings/> • Tuesday, 19 August - Friday 22 August

September

RIPE 46 • Amsterdam/Netherlands
<http://www.ripe.net/ripe/meetings/ripe-46> • Monday, 1 September - Friday, 5 September

RIPE NCC General Meeting • Amsterdam/Netherlands
<http://www.ripe.net/ripenc/about/gm> • Friday, 5 September

CENTR (19th GA) • Pisa/Italy
<http://www.centri.org/ga.html> • Thursday, 18 September - Friday, 19 September

October

NANOG 29 • Chicago, IL/USA
<http://www.nanog.org/future.html> • Sunday, 19 October - Tuesday, 21 October

ITU-T Study Group 2 • Florianopolis/Brazil
<http://www.itu.int/ITU-T/studygroups/com02/> • Tuesday, 21 October - Friday, 31 October

ARIN XII • Chicago, IL/USA
<http://www.arin.net/ARIN-XII/> • Wednesday, 22 October - Friday, 24 October

Internet Measurement Conference 2003 • Miami, FL/USA
<http://www.icir.org/vern/imc-2003/> • Monday, 27 October - Wednesday, 29 October

ICANN • Carthage/Tunisia
<http://www.icann.org/carthage/> • Monday, 27 October - Friday, 31 October

November

IETF 58 • Minneapolis, MN/USA
<http://www.ietf.org/meetings/meetings.html> • Sunday, 9 November - Friday, 14 November

LACNIC V • Havana/Cuba
<http://lacnic.net/en/lacnicV.html> • Wednesday, 19 November - Thursday, 20 November

December

Deploying IPv6 Networks • Paris/France
<http://www.upsideside.fr/newmobtech/ipv603cftp.htm> • Tuesday, 2 December - Friday, 5 December