RIPE ncc

EUROPEAN AUTONOMOUS SYSTEM NUMBER APPLICATION FORM & SUPPORTING NOTES

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To whom it may concern.

Thank you for your request for an Autonomous System (AS) number. The documentation below consists of two sections : the first section refers to SUPPORTING NOTES which give a definition and description of what an Autonomous System is, together with a description of when an AS number is needed and necessary. It is important that you read this section carefully.

The second section, the AS NUMBER TEMPLATE is the actual template that must be completed and returned to the RIPE Network Coordination Centre (NCC). This template is divided into two parts:

Part A - Administrative Details
Part B - Technical Details

You must complete part A in full. This is Mandatory. Part B should also be filled in, but at the time of application you may not know all the technical details. You can still get an AS number without completing Part B, but you are urged to submit the information as soon as possible.

Please ensure that you read all the information below carefully before submitting your application for an AS number. For more detailed explanations please refer to the paper **"Representation of IP Routing Policies in the RIPE Database"** RIPE document ID: ripe-081.

If you have any queries, please do not hesitate to contact the RIPE NCC who will be able to advise you. Our contact details are given below:


```
RIPE NCC                    email: hostmaster@ripe.net
Kruislaan 409               tel: +31 20 592 5065
1098 SJ Amsterdam           fax: +31 20 592 5090
The Netherlands
```


Yours sincerely.
hostmaster@ripe.net
RIPE Network Coordination Centre

SUPPORTING NOTES for AUTONOMOUS SYSTEM (AS) NUMBER REQUESTS

Please read the information below carefully. It is important that you read this before completing the template in the following section as it contains essential definitions.

What is an Autonomous System ?

An Autonomous System (AS) is a group of IP networks run by one or more network operators which has a single and clearly defined routing policy.

An AS has a unique number associated with it which is used in both the exchange of exterior routing information (i.e. network reachability information between ASes) and as an identifier of the AS itself. Exterior routing protocols such as BGP and EGP are used to exchange routing information between ASes.

In routing terms an AS will normally use one or more interior gateway protocols when exchanging network information within its own AS.

The term AS is often confused or even misused as a convenient way of grouping together a set of networks which belong under the same administrative umbrella even if within that group of networks there are various different routing policies. ASes can strictly have only one single routing policy.

On the other hand, the creation of an AS should be done in a conscious and well coordinated manner to avoid creating ASes for the sake of it, perhaps resulting in the worst case scenario of one AS per IP network number. This may mean that by applying the general rules for the creation and allocation of an AS below, some re-engineering may be needed. However, this may be the only way to actually implement a desired routing policy anyway.

How can I be sure I need an AS number ?

- Creation of an AS is only required when exchanging routing information with other ASes. Some router implementations make use of an AS number as a form of tagging to identify the routing process. However, it should be noted that this tag does not need to be unique unless routing information is indeed exchanged with other ASes.

- An IP network number can and must only belong to one AS. This is a direct consequence of the fact that at each point in the Internet there can only be exactly one routing policy for traffic destined to each network. In the case of the IP network which is used in neighbor peering between two ASes, say at the border between two ASes, a conscious decision must be made as to which AS this IP network number actually resides in.

- For a simple case of customer networks connected to a single service provider, the IP network should be a member of the service providers AS. In terms of routing policy the IP network has exactly the same policy as the service provider and there is no need to make any distinction in routing information. This idea may at first seem slightly alien to some, but it highlights the clear distinction in the use of the AS number as a representation of routing policy as opposed to some form of administrative use.

- If a network operator connects to more than one AS with different routing policies then they need to create their own AS. In the case of multi-homed customer networks connected to two service providers there are at least two different routing policies to a given customer network. At this point the customer networks will be part of a single AS and this AS would be distinct from either of the service providers ASes. This allows the customer the ability of having a different representation of policy and preference to the different service providers. This is the ONLY case where a network operator should create its own AS number.

- As a general rule one should always try to populate the AS with as many IP networks as possible, providing all IP networks conform to the same routing policy.

Each AS is represented in the RIPE database by an AS object. The AS object stores descriptive, administrative and contact information about the AS as well as the technical information relating to the routing policies of the AS in relation to all neighboring ASes. With an AS object you must also supply a completed PERSON template(s) which gives the full contact details for the tech-c and admin-c people.

Example of a completed allocated AS number template together with completed PERSON templates which are stored in the RIPE Network Management Database.

```
aut-num:   AS1104
descr:     NIKHEF-H
descr:     Science Park Watergraafsmeer
descr:     Amsterdam, The Netherlands
as-in:     AS1103 100 AS1103
as-in:     AS1890 100 AS1890 AS2004 AS288
as-in:     AS1888 100 AS1888
as-in:     AS2122 200 AS2122 AS2600
as-in:     AS2600 100 AS2600
as-out:    AS1103 AS1104
as-out:    AS1890 AS1104
as-out:    AS1888 AS1104
as-out:    AS2122 AS1104
as-out:    AS2600 AS1104
default:   AS1103 100
guardian:  ripe-op@nikhef.nl
admin-c:   Rob Blokzijl
tech-c:    Marten Terpstra
remarks:   peers with AS2122 and AS2600 are RR test peers
notify:    tony@ripe.net
notify:    marten@ripe.net
changed:   tony@ripe.net 940117
source:    RIPE

person:    Rob Blokzijl
address:   NIKHEF section H
address:   Science Park Watergraafsmeer (WCW)
address:   Kruislaan 409
address:   NL-1098 SJ Amsterdam
address:   The Netherlands
phone:     +31 20 592 5102
fax-no:    +31 20 592 5155
e-mail:    k13@nikhef.nl
changed:   dfk@cwi.nl 900802
changed:   ripe-dbm@ripe.net 920622
source:    RIPE

person:    Marten Terpstra
address:   RIPE Network Coordination Centre (NCC)
address:   PRIDE Project
address:   Kruislaan 409
address:   NL-1098 SJ Amsterdam
address:   Netherlands
phone:     +31 20 592 5064
fax-no:    +31 20 592 5090
e-mail:    Marten.Terpstra@ripe.net
nic-hdl:   MT2
notify:    marten@ripe.net
changed:   marten@ripe.net 931230
source:    RIPE
```

This example contains Part B - technical details "routing policy" information (starting from the tags as-in: up to and including the guardian: tag). It is not strictly necessary to supply this section in the initial application for an AS number, but which you are strongly urged to complete in the future when you know your "routing policy". This is especially important if you intend to connect to the Global Internet at some stage in the future.

It is important to note that if you decide to send in your "routing policy" later on, then you MUST accompany it with the full administrative information. Otherwise we will not know to which autonomous system and to which organisation the routing information applies!

Part A - Administrative Details

ADMINISTRATIVE TEMPLATE

aut-num:

How many AS numbers do you require?

Format: Please complete with a number.

```
Example:
     aut-num:     1
```

descr:

A short description of the Autonomous system.

Format: Free text, multiple lines in sequence allowed as shown in the example below.

Example:

```
descr:   NIKHEF section H
descr:   Science Park Watergraafsmeer
descr:   Amsterdam
```

tech-c: Name or NIC-handle of technical contact person. This is someone to be contacted for technical problems such as misconfiguration, etc.

Format: <firstname> <initials> <lastname>, multiple lines.

Example:

```
tech-c: John E. Doe
```

admin-c:

Name or NIC-handle of administrative contact person. This is most likely to be the same name as the guardian but it is not mandatory for it to be.

Format: <firstname> <initials> <lastname>, multiple lines.

Example:

```
admin-c: Joe T. Bloggs
```

changed:

Email address of the person who is completing the template, followed by the current date. If you do not have email connectivity please leave blank and we will complete it.

Format: As shown below.

Example:

```
changed: johndoe@terabit.nl 930225
```

source:

Source of the information. It will always be RIPE. This is information which is always required in the database, so it has been added already.

PERSON TEMPLATE

For each different person specified in the network template, please complete a separate person template, unless the data about those persons is already in the RIPE database.

person:

Please give the full name of the admin-c contact and the tech-c contact. There must be a person template completed for each different name specified.

Format: The names must be written identically to those given in the "admin-c:" and "tech-c:" attributes (but must not be the NIC handle) or official titles like "Dr, Prof or Sir".

Example:

```
person: Joe T. Bloggs
```

address:

Please complete with the full postal address.

Format: Write as you would for ordinary postal mail using one line for each part o f the address as shown in the example below:

Example:

```
address: Terabit Labs Inc.
address: North Perpendicular Road 12
address: NL−1234 Northtown
address: The Netherlands
```

phone:

Please give the work telephone number of the person specified above.

Format: Please specify the telephone number with + <country code> <area code> <telephone number> Most countries should drop the leading zero when specifying their area code. More than one telephone number is fine. Each telephone number should be put on a separate line and written in order of the most appropriate number for the contact person.

Example:

```
phone: +31 20 1233 4676
phone: +31 20 1233 4677 ext.  4711
```

fax-no:

Please complete with the telefax number of the person specified above.

Format: Follow with the same rules as specified for telephone number above.

Example:

```
fax−no: +31 20 12334678
```

e-mail:

Please supply the appropriate electronic mail address for the admin-c (the administrative contact person)/ and the tech-c (the technical contact person).

Format: Please ensure that this is a valid domain address. If you DO NOT have e-mail connectivity, please leave this blank as the email attribute will not be included in the administrative details stored in the database for this person.

Example:

```
e-mail: johndoe@terabit.nl
```

nic-hdl:

This refers to a NIC handle which is a unique identifier assigned and used by the US NIC to unambiguously refer to Internet people. If you do not have a NIC handle, then please leave blank.

Format: This is allocated by a NIC.

Example:

```
nic-hdl: JD0401
```

changed:

Who and when this last changed.

Format: Please complete with your e-mail address followed by the current date exactly as shown below. If you do not have e-mail connectivity, please leave blank and we will complete this on your behalf.

Example:

```
changed: johndoe@terabit.nl 930225
```

source:

Source of the information. This will always be RIPE and is a required field so it has been added.

Part B - Technical Details

You may not at the time of applying for your AS number know the technical details requested below. Therefore we do not make completing this section mandatory. However, you are *strongly urged* to complete this section as soon as possible once you know your routing policy and return your amended template to <hostmaster@ripe.net> for inclusion in the RIPE Network Management Database. Please note, that if you send this section in later, you must send it in accompanied by a completed Section A - Administrative Details otherwise we will not know to which AS or which organisation the routing policy information applies.

TECHNICAL TEMPLATE

as-in:

A description of accepted routing information from neighboring ASes.

Format: <aut-num> <cost> <routing policy expression>, on multiple lines where: <aut-num> refers to your neighboring AS. <cost> is a positive integer used to express a relative cost of routes learned. The lower the cost the more preferred the route. <routing policy expression> can take the following formats:

1. A list of one or more ASes, AS Macros and Communities.

Example:
```
as-in: AS1103 100 AS1103
as-in: AS786  105 AS1103
as-in: AS786  10  AS786 HEPNET
as-in: AS1755 110 AS1103 AS786
```

2. A set of KEYWORDS. The following keywords are currently defined.

Example:
```
ANY — this means anything the neighbor AS knows.
RIPE-DB — any network currently in the RIPE database.
LOCAL — any network in the RIPE database which is part
of the community LOCAL (i.e. no connectivity outside its
own organisation).
```

3. A logical expression of either 1 or 2 above. The current logical operators are defined as:

Format:
AND
OR
NOT

NOTE: if no logical operator is given between ASes, AS-macros, Communities and KEYWORDS it is implicitly evaluated as an **'OR'** operation. The OR can be left out for conciseness. Rules are grouped together using parenthesis i.e "(" and ")".

Example:
```
as-in: AS1755 100 RIPE-DB AND NOT (LOCAL OR AS1234 OR AS513)
as-in: AS1755 150 AS1234
```
A rule can be wrapped over lines providing the associated <aut-num> and <cost> values are repeated and occur on consecutive lines.

Example:

```
as-in: AS1755 100 RIPE-DB AND NOT (LOCAL AS1234 AS513)
```

and

Example:

```
as-in: AS1755 100 RIPE-DB AND NOT (LOCAL
as-in: AS1755 100 AS1234 AS513)
```

are evaluated to the same result.

as-out:

A description of generated routing information sent to other AS peers.

Format: <aut-num> <routing policy expression>, multiple lines. Where <aut-num> refers to your AS neighbor. <routing policy expression> is explained in the as-in definition

Example:

```
as-out: AS786 RIPE-DB AND NOT (AS978 LOCAL)
```

default:

An indication of how default routing is done.

Format: <aut-num> <relative cost>, multiple lines. Where <aut-num> The AS peer you will default route to. <relative cost> The relative cost is a positive integer use to express a preference for default. There is no relationship to the cost used in the "as-in" tag. The lower the cost indicates which AS peer is more preferred for default.

Example:

```
default: AS1755 10
default: AS786  5
```

guardian:

Mailbox address of the guardian of the Autonomous System

Format: <email-address>, single line. This should be in RFC822 format wherever possible.

Example:

```
guardian: as1104-guardian@nikhef.nl
```

EUROPEAN AUTONOMOUS SYSTEM NUMBER APPLICATION FORM

Part A - ADMINISTRATIVE TEMPLATE

```
aut-num:
descr:
tech-c:
admin-c:
source: RIPE
changed:

person:
address:
address:
address:
address:
phone:
fax-no:
e-mail:
changed:
source: RIPE

person:
address:
address:
address:
address:
phone:
fax-no:
e-mail:
changed:
source: RIPE
```

Part B - TECHNICAL TEMPLATE

```
as-in:
as-in:
as-out:
as-out:
default:
guardian:
```

Please return this completed template to **<hostmaster@ripe.net>.** You can also send it by fax. Mark your fax for the attention of **RIPE NCC HOSTMASTER.** Our fax number is **+31 20 592 5090.**