Description of Inter-AS Networks in the RIPE Routing Registry

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Addendum to
Representation of IP Routing Policies
in the RIPE Database (ripe-81)

What is an Inter-AS Network ?

Inter-AS IP networks are those networks which connect multiple autonomous systems (1). An inter-AS network exists for the purpose of passing traffic and routing information between different autonomous systems. The most simple example of an inter-AS network is a point-to-point link, connecting exactly two ASes. Each end of such a link is connected to an interface of router living in each of the autonomous systems. More complex examples are broadcast type networks with multiple interfaces connecting multiple ASes with the possibility of more than one connection per AS.

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(1) Inter-AS networks are currently called FIXes, IXFs, DMZs, NAPs, GIX and other names.

Which additional information is needed?

Consider the following example of three routers 1, 2 and 3 with interfaces a through f connected by two inter-AS networks X and Y:

```
         X              Y
a1b     ---    c2d     ---    e3f
```

Suppose that network X is registered in the routing registry as part of AS1 and net Y as part of AS3. If traffic passes from left to right prtraceroute will report the following sequence of interfaces and ASes:

a in AS1
c in AS1
e in AS3

The traceroute algorithm enumerates only the **receiving** interfaces on the way to the destination. In the example this leads to the passage of AS2 going unnoticed. This is confusing to the user and will also generate exceptions when the path found is checked against the routing registry.

For operational monitoring tools such as *prtraceroute* it is necessary to know which interface on an inter-AS network belongs to which AS. If AS information is not known about interfaces on an inter-AS network, tools like *prtraceroute* cannot determine correctly which ASes are being traversed.

Routing Registry Format

All interfaces on inter-AS networks will be described in a new *ias-int* attribute of the corresponding network object in the RIPE database. The *ias-int* attribute has the following syntax:

ias-int: <interface-address> <autonomous-system>

The <interface-address> must be an address within the corresponding intenum and <autonomous-system> must be of the form AS<number> referring to an aut-num object in the database.

For example:

```
inetnum:   193.193.193.0
netname:   INTER-AS-EXAMPLE
descr:     This is a hypothetical inter-as network.
descr:     It might be called a NAP, FIX, GIX, IXF, DMZ,
descr:     Mehrfachdienstanbieterkommunikationseinrichtung or ...
country:   DE
admin-c:   Werner Mueller
tech-c:    Paul Schmitz
tech-c:    Hans Meier
changed:   ripe-dbm@ripe.net 920714
aut-sys:   AS4711
ias-int:   193.193.193.1 AS123
ias-int:   193.193.193.3 AS4711
ias-int:   193.193.193.9 AS789
source:    RIPE
```

Note that the interface 193.193.193.3 is described although it is in the same AS as the network. This is recommended practice.

The update procedure for the ias-int attribute will be the normal update procedure for network objects. The attribute does not need to be guarded because it does not influence routing policy of operational traffic.

In which AS does an Inter-AS Network belong?

Only one AS announces an inter-AS network externally. The other ASes connected to the inter-AS network will probably carry this network in their internal routing for redundancy but will not announce it to other ASes.

In exceptional cases more than one AS may need to originate external routing information about the inter-AS network, This kind of routing setup cannot be described within the framework of ripe-81 and is generally discouraged. Tools using a ripe-81 type registry could take heuristic hints from the *ias-int* attributes when they encounter such situations.