

Extended Allocation and Assignment Report for RIRs

1. Introduction

As result of the exhaustion of IPv4 address space and the need for transparency in future allocation of IPv6 address space from IANA to RIRs we propose an extended format to record allocation and assignment of numeric resources in the RIR Statistics reports.

The first document proposing to extend the format of the RIR Statistics reports dates from 2009 (1) and it was used as the base for the production report from APNIC (2) and for the beta (3) in RIPE NCC. However there are some differences from the original report, the implementation in the beta from RIPE NCC and the description and implementation of the report in APNIC.

In order to produce a clear guide for implementations in the different RIRs and for users of the report, the NRO has decided to document the new extended format in this document.

This new format has clear advantages over its predecessor:

1. This change would indicate that the RIRs are clearly aware of the address space they are responsible for, and the status of that address space.
2. A process of generating a "union" of the statistics reports would allow the RIRs to quickly identify inconsistencies across the RIRs' records. It would allow identification of overlaps as well as gaps between address spaces managed by different RIRs.
3. It provides a clear picture for the status of transferred address space.
4. It provides a clear picture of the administrative responsibility for unallocated resources.

2. Format

The format of the extended report is very similar to the current format. The major differences are the new disposition values and the new reg-id field.

2.1. File names

Each file is named using the format:

delegated-<RIR>-extended-<yyyymmdd>

The most recent file will also be available under the name:

delegated-<RIR>-extended-latest

Where <RIR> has to be substituted by the name of the RIR.

2.2. File format

The file consists of:

- Comments
- File header lines
- Records

Header and record lines are structured as 'comma separated fields' (CSV). Leading and trailing blank text in fields are not meaningful. The vertical line character '|' (ASCII code 0x7c) is used as the CSV field separator.

After the header lines, records are not sorted.

2.3. Comments

Comments are denoted by # at the beginning of a line. No line-embedded comments are permitted. Comments may occur at any place in the file.

Example:

```
#optional comments.
# any number of lines.

#another optional comment.
```

Blank lines are permitted, and may occur at any place in the file.

2.4. File header

The file header consists of the version line and the summary lines for each type of record.

2.4.1. Version line

Format:

```
version|registry|serial|records|startdate|enddate|UTCoffset
```

Where:

version format version number of this file. Current version is 2.3
 registry as for records and filename (see below);

serial	serial number of this file (within the creating RIR series);
records	number of records in file, excluding blank lines, summary lines, the version line and comments;
startdate	start date of time period, in yyyyymmdd format; this is the date of the oldest record in the file
enddate	end date of period in yyyyymmdd format; this is the date of the most recent record in the file
UTCoffset	offset from UTC (+/- hours) of local RIR producing file.

2.4.2. Summary line

The summary lines count the number of record lines of each type in the file.

Format:

registry|*|type|*|count|summary

Where:

registry	as for records (see below);
*	an ASCII '*' (unused field, retained for spreadsheet purposes);
type	as for records (defined below);
count	sum of the number of record lines of this type in the file.
summary	the ASCII string 'summary' (to distinguish the record line);

Note that the count does not equate to the total amount of resources for each class of record. This is to be computed from the records themselves.

2.5. Records

After the defined file header, and excluding any space or comments, each line in the file represents a single allocation (or assignment) of a specific range of Internet number resources (IPv4, IPv6 or ASN), made by the RIR identified in the record.

IPv4 records may represent non-CIDR ranges or CIDR blocks, and therefore the record format represents the beginning of range, and a count. This can be converted to prefix/length using simple algorithms.

IPv6 records represent the prefix and the count of /128 instances under that prefix.

Format:

registry|cc|type|start|value|date|status|reg-id[|extensions...]

Where:

registry	The registry from which the data is taken.
cc	ISO 3166 2-letter code of the organisation to which the allocation or assignment was made.
type	Type of Internet number resource represented in this record. One value from the set of defined strings: {asn,ipv4,ipv6}
start	In the case of records of type 'ipv4' or 'ipv6' this is the IPv4 or IPv6 'first address' of the range. In the case of an 16 bit AS number, the format is the integer value in the range: 0 - 65535 In the case of a 32 bit ASN, the value is in the range: 0 - 4294967296 No distinction is drawn between 16 and 32 bit ASN values in the range 0 to 65535.
value	In the case of IPv4 address the count of hosts for this range. This count does not have to represent a CIDR range. In the case of an IPv6 address the value will be the CIDR prefix length from the 'first address' value of <start>. In the case of records of type 'asn' the number is the count of AS from this start value.
date	Date on this allocation/assignment was made by the RIR in the format: YYYYMMDD Where the allocation or assignment has been transferred from another registry, this date represents the date of first assignment or allocation as received in from the original RIR.

It is noted that where records do not show a date of first assignment, this can take the 0000/00/00 value.

status	<p>Type of record from the set:</p> <p>{available, allocated, assigned, reserved}</p> <p>available The resource has not been allocated or assigned to any entity. This is one of the new fields in the extended format.</p> <p>allocated An allocation made by the registry producing the file. Only direct allocations must be included. For example, allocations made from one RIR to another RIR as ERX or Inter-RIR transfers must not be recorded.</p> <p>assigned An assignment made by the registry producing the file. Only direct assignments must be included. For example, assignments made from one RIR to another RIR as ERX or Inter-RIR transfers must not be recorded.</p> <p>reserved The resource has not been allocated or assigned to any entity, and is not available for allocation or assignment for some reason. A non exhaustive list of examples are: Space reserved for growth of an specific LIR/ISP; space set aside for anycast services; space set aside for experimental services and returns that are currently not assigned but not yet cleared and available for reassignment.</p>
reg-id	<p>This is an in-series identifier which uniquely identifies a single organisation, an Internet number resource holder.</p> <p>All records in the file with the same reg-id are registered to the same resource holder.</p>

3. New records and additional disposition values

3.1. Record Reg-id

This is an in-series identifier which uniquely identifies a single organisation, an Internet number resource holder. All records in the file with the same reg-id are registered to the same resource holder. The reg-id is not guaranteed to be constant between versions of the file.

If the records are collated by type, reg-id and date, records of the same type for the same opaque-id for the same date can be held to be a single assignment or allocation

The value of the new field is textual and should be as simple as possible; it may be the rigid/orgid itself, or a name derived from a registry name, or an obfuscated version of these or some other parameters. RIRs may choose how far they follow the allocation chain, however they must at least distinguish the organisations to which they themselves have made the allocation or assignment.

3.2. Disposition value “Available”

Resources that are marked as “available” indicate that the resource is currently in the unallocated pool of the RIR or the IANA and the RIR is uniquely responsible for them. This is to avoid any overlap of resources.

The first field of the record (designated registry) identifies the current holder of the unallocated resource, or “iana” if the resource is located in the unallocated resource pool administered by the IANA. Such “available” records would use a country code of (“ZZ”) or “” when the code is not available, and the date field that records the date of last status change of this resource, if known, otherwise “00000000” or “” if not known.

4. Implementation

RIRs should publish statistics files with this new format as soon as possible and they should maintain the legacy format for some time. RIRs should monitor the union of these files for inconsistencies and implement procedures to resolve any inconsistencies that may appear.

RIRs should publish a set of historical stats files according to this format if at all feasible. We realise that it may be difficult to generate a set of new format files that is 100% consistent with previously published stats files due to changes in methodology. However we consider this worthwhile for quite a number of useful studies.

4.1. Examples

4.1.1. Summary Line

```
2.3|ripenc|1318198021|70130|19830705|20111007|+0200
ripenc|*|ipv4|*|43560|summary
ripenc|*|asn|*|23518|summary
ripenc|*|ipv6|*|20844|summary
```

4.1.2. IPv4

```
apnic|AU|ipv4| 192.0.2.0|256|19910827|assigned|A91F45A5
apnic|NZ|ipv4| 198.51.100.0|256|19910903|assigned|A9DF494A
apnic||ipv4|203.0.113.0|256||reserved|
```

4.1.3. IPv6

ripenc|RU|ipv6|2001:db8::|48|20110209|allocated| BFD494A
ripenc|LV|ipv6|2001:db8:1::|48|20110420|allocated|A51SBE57
ripenc||ipv6|2001:db8:2::|48||available|

References

1. Kisteleki R et al. "Proposal to Extend the Format of the RIR Statistics Reports", October 2009
2. "APNIC EXTENDED ALLOCATION AND ASSIGNMENT REPORTS", Online: <ftp://ftp.lacnic.net/pub/stats/apnic/README-EXTENDED.TXT>, December 2011
3. "Extended 'delegated' files", Online: <http://albatross.ripe.net/delegated-extended/>

Change Log

From version 0 to 20120419

- Change log added
- Definition for startdate and enddate improved in Section 2.4.1
- Definitions for record "allocated" and "reserved" in Section 2.5 modified
- Section 3.2 added text to avoid overlapped resources
- Section 3.2 included "" as a value for unknown country code or date

From version 20120419 to 20120525

- Added text to "allocated" and "assigned" definitions