Database Update

Kaveh Ranjbar
Database Department Manager, RIPE NCC
RIPE Database statistics

- Operational stats:
On reporting issues and change mgmt

- Full transparency, everything is announced on:
  - http://www.ripe.net/lir-services/service-announcements

- Public release notes are available at:
  - https://www.ripe.net/data-tools/db/release-notes

- Issues with significant impact on our users are always announced on mailing lists
Progress

What we did?
Redevelopment of Whois

- Redevelopment of whois backend was finished on Q1 2013
- All RIPE Database operations are handled by new software, old platform is fully decommissioned
- New system has helped us to deploy a fault tolerant and easy to maintain infrastructure
New whois benefits

• Fast, simple and a lot more flexible
  – Changes and new features are implemented much faster
  – Well tested code, provides quick feedback on possible impact of any change
  – Verbose logging, live management
  – Simple hardware, easy to deploy, no special dependency, easy failover and easy to scale
Example infrastructure change - BEFORE

Update Servers

Query Servers

Home grown protocol, hard to maintain, not scalable
Example infrastructure change - AFTER

Update Servers

Active

Backup

Datastore

Query Servers

Datastore

Standard MySQL Replication

Datastore

Queries/Updates

Datastore

Queries/Updates

Datastore

Queries/Updates

Datastore

Queries/Updates

Standard based, Easy to maintain and upgrade approach
Integrated system

- No hacks! The system runs as a configurable, single entity
- We have been able to easily automate complex processes like reclaim functionality
- Proper management and reporting API (internal)
- Hot deployment to cluster with no downtime, implementing long options along with deployment took half a day for one engineer
Open source

- Code is available at:
  - https://www.github.com/RIPE-NCC/whois
- BSD License, easy to install and change
- 229K lines of code, 139K of it are tests!
- No dependencies, no container:
  - Java runtime and MySQL to run
  - Java SDK, MySQL, git and maven to build
- Proposing to provide Drop-in VM
Action Items

Denis Walker
Database Business Analyst, RIPE NCC
AP65.1: ORG Object changes

- With the new code in place NCC proposed changes were not required:
  - All resource objects already have an ORG Reference:
    - PA Objects have the LIR ORG on them
    - PI Objects have (or will have) LIR or ENDUSER organisation object on them
  - Same model is used for abuse-c implementation
    - With tagging it can even improve!

- Policy proposal to add sponsoring ORG
AP65.2: Raise interest in Geo Location

- Alex Band
AP65.3: Personal data in Object History

- DB Service is in Beta (more details on further slides)
  - No personal data objects (person/role) are returned through the service

- Legal department cleared the service

- No deleted objects shown, should we show them?
AP65.4: Document 2011-06 before impl.

- Implementation plan and impact analysis published on:
  - https://labs.ripe.net/Members/kranjbar/implementation-details-of-policy-2011-06

- Detailed explanation published on:

- Announcements were sent to ncc-announce, ncc-services, db-wg and anti-abuse-wg

- Now in service with an already good utilisation: 25% of v4 allocations (35.8% in total alloc. size)
On Goings

What we are working on
API

- We have re-developed the API code
- Backward compatible, but queries are handled directly from whois core instead of parsing RPSL results
  - Much faster
  - More consistent and is for all services
  - Streaming of results
  - Self documenting
History of objects

• Useful for change management, recovery, investigation and research

• Was released in April as beta

• History of all objects (except person and role) are available with a query option

• Available through API and WEB as well as port 43
Example History Query

$ whois -h whois.ripe.net -- "--list-versions ORG-RIEN1-RIPE"
% This is the RIPE Database query service.
% The objects are in RPSL format.
% The RIPE Database is subject to Terms and Conditions.
% See http://www.ripe.net/db/support/db-terms-conditions.pdf

% Version history for object "ORG-RIEN1-RIPE"
% You can use "--show-version rev#" to get an exact version of the object.

rev# Date Op.
1 2012-03-09 14:21 ADD/UPD
2 2012-03-09 14:24 ADD/UPD
3 2012-03-09 15:06 ADD/UPD
4 2012-03-09 15:30 ADD/UPD
5 2012-03-09 16:04 ADD/UPD
6 2012-03-09 16:04 ADD/UPD
7 2012-03-09 16:07 ADD/UPD
8 2012-03-16 11:23 ADD/UPD
9 2012-03-19 17:32 ADD/UPD
10 2012-03-20 13:15 ADD/UPD
11 2012-04-16 14:48 ADD/UPD
12 2012-04-18 09:44 ADD/UPD
13 2012-04-25 09:58 ADD/UPD
14 2012-04-25 09:59 ADD/UPD
15 2012-04-25 10:02 ADD/UPD
16 2012-05-03 16:54 ADD/UPD
17 2012-06-28 18:29 ADD/UPD
18 2012-08-10 15:41 ADD/UPD
19 2012-08-10 15:57 ADD/UPD
20 2012-08-10 16:00 ADD/UPD
21 2012-08-10 16:19 ADD/UPD
22 2013-03-19 17:10 ADD/UPD

% This query was served by the RIPE Database Query Service version 1.57.1

$ whois -h whois.ripe.net -- "--show-version 1 ORG-RIEN1-RIPE"
% This is the RIPE Database query service.
% The objects are in RPSL format.
% The RIPE Database is subject to Terms and Conditions.
% See http://www.ripe.net/db/support/db-terms-conditions.pdf

% Note: this output has been filtered.
% To receive output for a database update, use the "-B" flag.

% Version 1 of object "ORG-RIEN1-RIPE"
% This version was a UPDATE operation on 2012-03-09 14:21
% You can use "--list-versions" to get a list of versions for an object.

% Information related to 'ORG-RIEN1-RIPE'
organisation: ORG-RIEN1-RIPE
org-name: Reseaux IP Europeens Network Coordination Centre (RIPE NCC)
org-type: RIR
descr: RIPE NCC Operations
address: Singel 258
1016 AB Amsterdam
NETHERLANDS
phone: +31205354444
fax-no: +31205354445
mnt-ref: RIPE-NCC-HM-MNT
mnt-by: RIPE-NCC-HM-MNT
source: RIPE # Filtered

% This query was served by the RIPE Database Query Service version 1.57.1
Proposal: Improvements on Dummification

• We currently remove all personal data from nightly dumps using a ‘greedy’ approach
  – But we also remove all links between the objects
  – And data was replaced with static values
    – Made it useless for researchers

• New proposal: Making the dummification algorithm more smart
  – Keep parts of phone numbers, email addresses and addresses visible while maintaining the links

Example Dummification

Current Structure

```
inetnum: 193.0.0.0 - 193.0.7.255
netname: RIPE-NCC
descr: RIPE Network Coordination Centre
descr: Amsterdam, Netherlands
remarks: Used for RIPE NCC infrastructure.
country: NL
admin-c: JDR-RIPE
admin-c: BRD-RIPE
technical-c: OPS4-RIPE
status: ASSIGNED PI
source: RIPE
mnt-by: RIPE-NCC-MNT
mnt-lower: RIPE-NCC-MNT
changed: hostmaster@ripe.net 20090203
changed: bit-bucket@ripe.net 20110217
```

Proposed Structure

```
inetcnum: 193.0.0.0 - 193.0.7.255
netname: RIPE-NCC
descr: RIPE Network Coordination Centre
descr: Amsterdam, Netherlands
remarks: Used for RIPE NCC infrastructure.
country: NL
admin-c: JDR-RIPE
admin-c: BRD-RIPE
technical-c: OPS4-RIPE
notify: ncc@ripe.net
status: ASSIGNED PI
source: RIPE
mnt-by: RIPE-NCC-MNT
mnt-lower: RIPE-NCC-MNT
changed: bit-bucket@ripe.net 20110217
```

```
inetcnum: 193.0.0.0 - 193.0.7.255
netname: RIPE-NCC
descr: RIPE Network Coordination Centre
descr: Amsterdam, Netherlands
remarks: Used for RIPE NCC infrastructure.
country: NL
admin-c: DUMY-RIPE
technical-c: DUMY-RIPE
status: ASSIGNED PI
source: RIPE
mnt-by: RIPE-NCC-MNT
mnt-lower: RIPE-NCC-MNT
changed: unread@ripe.net 20110217
```

```
inetcnum: 193.0.0.0 - 193.0.7.255
netname: RIPE-NCC
descr: RIPE Network Coordination Centre
descr: Amsterdam, Netherlands
remarks: Used for RIPE NCC infrastructure.
country: NL
admin-c: JDR-RIPE
admin-c: BRD-RIPE
technical-c: OPS4-RIPE
notify: ***@ripe.net
status: ASSIGNED PI
source: RIPE
mnt-by: RIPE-NCC-MNT
mnt-lower: RIPE-NCC-MNT
changed: ***@ripe.net 20110217
```
Proposal: Tags

• New proposal to optionally provide operational metadata along with updates
  – System will tag resources, for example all RIPE Region resources as %RIPE_Region
  – Results can be filtered based on tags
  – Can be extended to cover any other service, objects marked for automatic cleanup, lameness check results, assisted registry check markers, etc.
  – Very useful for data clean up
  – No change to existing behavior
Vision

Longer term plans and ideas for improving the RIPE Database
Plan: Unref. Object Automatic Cleanup

- Person/Role/Maintainer/Key-cert/ORG objects with no reference will be automatically deleted after 90 days
- a TAG will show users if an object is a candidate for automatic cleanup and when
- Next step is to look into cluster of objects - ROLE referring a PERSON and same MNTNER – no other references to these three objects
Proposal: Placeholder cleanup

- A lot of placeholder objects with no real benefit (e.g. 0/0 and AS-BLOCKS) except for internal software consistency
- With proper tagging and authorisation business rules we can remove all of them
  - We already import all other RIR public data, now we tag the data based on their published “stat” file
  - All resources, globally, allocated/assigned are tagged
  - Database search (with --all-sources option) will show proper matches without placeholders clutter
Idea: RIPE Easy Whois

- Simple to use web interface for searching on resources
  - Will always show single results, with clear indication of which RIR is responsible for a resource and who is the data maintainer
  - Will provide data in easy to understand form, RPSL data will be available with a single click

- Clear indication of responsible entities for each piece of data
Proposal: Route object cleanup proposal

- Changing the Auth. requirements for ROUTE object from IP Address holder AND ASN holder to only IP address holder
  - Route statement says this network MIGHT be advertised from that ASN
    - Why do we need the ASN to auth. that?
  - Same behavior already exists in ROA creation, only IP address holder needs to authorise

- Will help improve usability
Idea: Single Sign On Integration

- Will be backwards compatible
- New auth type in maintainer:
  - auth: SSO sso_registered_email
- Should work both ways, maintain SSO access for a maintainer from RIPE Access control panel or by editing the maintainer object
- Added value for web tools, will provide a maintainer based view on web updates
Plan: Documentation

- We are working on streamlining DB Documentation and RIPE Database’s webpages
  - Easy to read, short and concise set of documentation in only three document sets:
    - Accessing Data
    - Updating Data
    - Developer Documentation
  - Will always be linked to a version of the code
  - Work with TS to produce additional material
Questions?