

APNIC Whois & RDAP

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Outline

- APNIC Whois database upgrade
- Implementation of org object
- Intro of historical whois
- Creation of API to provide RDAP responses to historical queries

APNIC Whois database upgrade

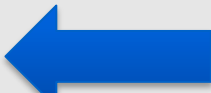
- Motivation
 - To take advantage of enhanced syntax, new flags, and attributes
 - To have a better operational testing platform (dry-run updates)
 - To provide richer APNIC database query options to the public
- Implementation in stages
 - To ensure smooth transition
 - For more details refer to:
 - https://www.apnic.net/about-apnic/whois_search/whois-upgrade/whois-database-upgrade-plan/

New attribute to look out for

- “last-modified”
 - The attribute “last-modified” indicates when an object was last updated
- To replace “changed” attribute
 - Eventually lead to deprecation of the “changed” attribute


Implementation of last-modified

```
organization: ORG-APNIC1-AP
org-name: Asia Pacific Network Information Centre
descr: Regional Internet Registry for the Asia Pacific r
country: AU
address: 6 Cordelia Street, South Brisbane, QLD 4101, Aust
phone: +61 7 3858 3100
fax-no: +61 7 3858 3199
e-mail: helpdesk@apnic.net
mnt-ref: APNIC-HM
notify: helpdesk@apnic.net
mnt-by: APNIC-HM
changed: hm-changed@apnic.net 20170715
source: APNIC
```



From

```
organization: ORG-APNIC1-AP
org-name: Asia Pacific Network Information Centre
descr: Regional Internet Registry for the Asia Pa
country: AU
address: 6 Cordelia Street, South Brisbane, QLD 4
phone: +61 7 3858 3100
fax-no: +61 7 3858 3199
e-mail: helpdesk@apnic.net
mnt-ref: APNIC-HM
notify: helpdesk@apnic.net
mnt-by: APNIC-HM
last-modified: 20170530T13:27:32Z
source: APNIC
```



To

Implementation of last-modified

- Implementation of last-modified will take place in two phases
 - Phase 1 - Introduction of use of last-modified
 - Database updates submitted containing the changed attribute will be accepted, but a warning message will be received
 - Database update automatically changed to contain last-modified
 - Implementation for Phase 1 end of September
 - Phase 2 – Use of changed will be obsolete
 - Therefore updates containing this attribute will no longer be accepted
 - Tentative implementation date for Phase 2 is before APRICOT 2018

New object - Organization object

```
organization: ORG-APNIC1-AP
org-name: Asia Pacific Network Information Centre
descr: Regional Internet Registry for the Asia Pacific region
country: AU
address: 6 Cordelia Street, South Brisbane, QLD 4101, Australia
phone: +61 7 3858 3100
fax-no: +61 7 3858 3199
e-mail: helpdesk@apnic.net
mnt-ref: APNIC-HM
notify: helpdesk@apnic.net
mnt-by: APNIC-HM
last-modified: 20170530T13:27:32Z
source: APNIC
```

Org objects - What's next for you

- Check your company information
- Update info via MyAPNIC if needed
- Org object created once details have been verified

History in WHOIS

- History mechanism added to the RIPE NCC WHOIS code ~2012
 - ADD of new object instantiates object serial in DB schema
 - On UPD of WHOIS record, prior object moves to history table
 - On DEL, head object moves to history table.
-
- ADD of 'same' object creates new object serial in DB
 - No linkage from prior object serial to current object serial
 - ADD-UPD-...DEL-ADD of 'identical' object truncates visible history

Event Visible WHOIS object

ADD

Inetnum: A
Netname: Net-A
Changed: 2011-07-24



UPD

Inetnum: A
Netname: Net-B
Changed: 2012-01-01



UPD

Inetnum: A
Netname: Net-C
Changed: 2015-11-05



DEL



ADD

Inetnum: A
Netname: Net-C
Changed: 2015-11-05

History Table

1

History
Serial Number
Created

Inetnum: A
Netname: Net-A
Changed: 2011-07-24



Inetnum: A
Netname: Net-B
Changed: 2012-01-01



Inetnum: A
Netname: Net-C
Changed: 2015-11-05

2

History
Serial Number
Created

Inetnum: A
Netname: Net-C
Changed: 2015-11-05

Object Created

Object Renamed

Object Renamed

Object Deleted

Object Re-created

Consequence: loss of visible history

- We know what happened to the object, we can't show it
- RIPE view this as 'by design' to permit history truncation
 - European Data privacy law, related motivations
- LEA, IPR, other searches of object history now hard
 - Fraud detection has become harder
 - History Serials not exposed to search mechanism. Requires DB access
- What can we do about his?
 - Move to RDAP!

RDAP is the future

- Consistent data format, common across Numbers & Names WHOIS
- JSON structured, easy to incorporate into modern coding languages with native support of “hash” or “dict” data structures
- Limitations:
 - Does not currently represent all RPSL data so not suitable for IRR
 - Not yet widely adopted in names WHOIS but actively under consideration
- APNIC offered RDAP as a fully supported service May 2015

`$ curl https://rdap.apnic.net/ip/203.133.248.0 | jq`

```
$ curl https://rdap.apnic.net/ip/203.133.248.0 | jq
{
  "handle": "203.133.248.0 - 203.133.251.255",
  "startAddress": "203.133.248.0",
  "endAddress": "203.133.251.255",
  "ipVersion": "v4",
  "name": "APNIC-AU-RD",
  "type": "ALLOCATED PORTABLE",
  "country": "AU",
  "objectClassName": "ip network",
  "entities": [{
    "handle": "IRT-APNICRANDNET-AU",
    "vcardArray": [ "vcard"
  :
  :
```

↑
This bit is RFC7482

← This bit is RFC7483

URL and content well defined
By a set of RFC's which reflect
current coding practices

RDAP: JSON encoded resource records

- Same data as in WHOIS, but re-encoded into JSON
- Carried over HTTP(S) using REST query syntax for objects
- Structure used is IETF defined, common with names WHOIS
- Easily (trivially) fetched and parsed by commandline tools eg curl/jq
- Automatically self-steering:
 - Directory from the top down maintained by IANA
 - Redirect between RIR via HTTP 302 redirection
- We added history as an outer From/To reference to make WHOWAS
 - WHOWAS service started December 2016

```
$ curl \
```

```
https://rdap.apnic.net/history/ip/203.133.248.0 | \
```

```
jq
```

↑
This bit extends RFC7482

```
$ curl https://rdap.apnic.net/history/ip/203.133.248.0 | jq
```

```
{
  "applicableFrom": "2016-09-19T08:17:49Z",
  "applicableUntil": "2017-02-08T05:39:21Z",
  "content": {
    "handle": "203.133.248.0 - 203.133.251.255",
    "startAddress": "203.133.248.0",
    "endAddress": "203.133.251.255",
    "ipVersion": "v4",
    "name": "APNIC-AU-RD",
    "type": "ALLOCATED PORTABLE",
    "country": "AU",
    "objectClassName": "ip network",
    "entities": [{
      "handle": "IRT-APNICRANDNET-AU",
      "vcardArray": [ "vcard"

```

← This bit extends RFC7483

Same content as the non-history version, decorated with the from/ until dates

Now as a set of objects

We're testing clients to use this

- Uses this underlying <http://rdap.apnic.net/history> URL form
- Client then uses JS code to display the returned JSON as a history view
- Timeline of change points of the resource
- Can walk through prior states of the data, see what changed (diff colourized)
- You can write your own code. Its HTTPS + REST + JSON

https://prototypes.apnic.net:4430/whowas/

APNIC Whowas

203.133.248.0 - 203.133.251.255
203.0.0.0 - 203.255.255.255
202.0.0.0 - 203.255.255.255
0.0.0.0 - 255.255.255.255

2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

26/08/2015 01:41 <> <27/08/2015 04:18 <> <04/05/2016 00:08 <>

network name
APNIC-JP-RD
network
203.133.248.0 - 203.133.251.255
country
JP
type
ASSIGNED PORTABLE
! remarks
/22 for APNIC R&D node in Japan and AU.

~~This object can only be updated by APNIC hostmasters.
To update this object, please contact APNIC
hostmasters and include your organisation's account
name in the subject line.~~

/22 for APNIC R&D node in Japan and AU.

To report network abuse, please contact the IRT
For troubleshooting, please contact tech-c and admin-c
For assistance, please contact the APNIC Helpdesk

description
APNIC R&D Centre JP

handle
[IRT-APNICRANDNET-AU](#)
name
IRT-APNICRANDNET-AU
kind

RDAP History extension

- Developed in common with the NRO engineering coordination group
- Taken into IETF standards in REGEXT working group
- Fully documented on github, UI code examples
- Constructs history by stepping over the new history-table serials in WHOIS DB, to compute path back in time beyond DEL operations
- Encompasses block splits, merges, can make for a large search space
 - We limit this in the UI and the back-end REST api

Your all invited!

APNIC 44



TAICHUNG, TAIWAN
7-14 September 2017

Participate remotely!

conference.apnic.net/44



Thanks!

