

Legal aspects of Internet Number Resources

“Who owns Internet Number Resources?”

Jochem de Ruig

Chief Financial Officer

RIPE NCC

Since 1992 in Amsterdam

Not-for-profit association

Independent organisation

6000+ members in 75 countries

One of the five RIRs

RIPE NCC does not make policies





Focus on 2 issues

Ownership of asset main requirements:

1. Needs to be an asset - Object
 - a) Material
 - b) Capable of human control
2. “Clear detectable Ownership” – legitimisation /
identifiability of Users



Contents

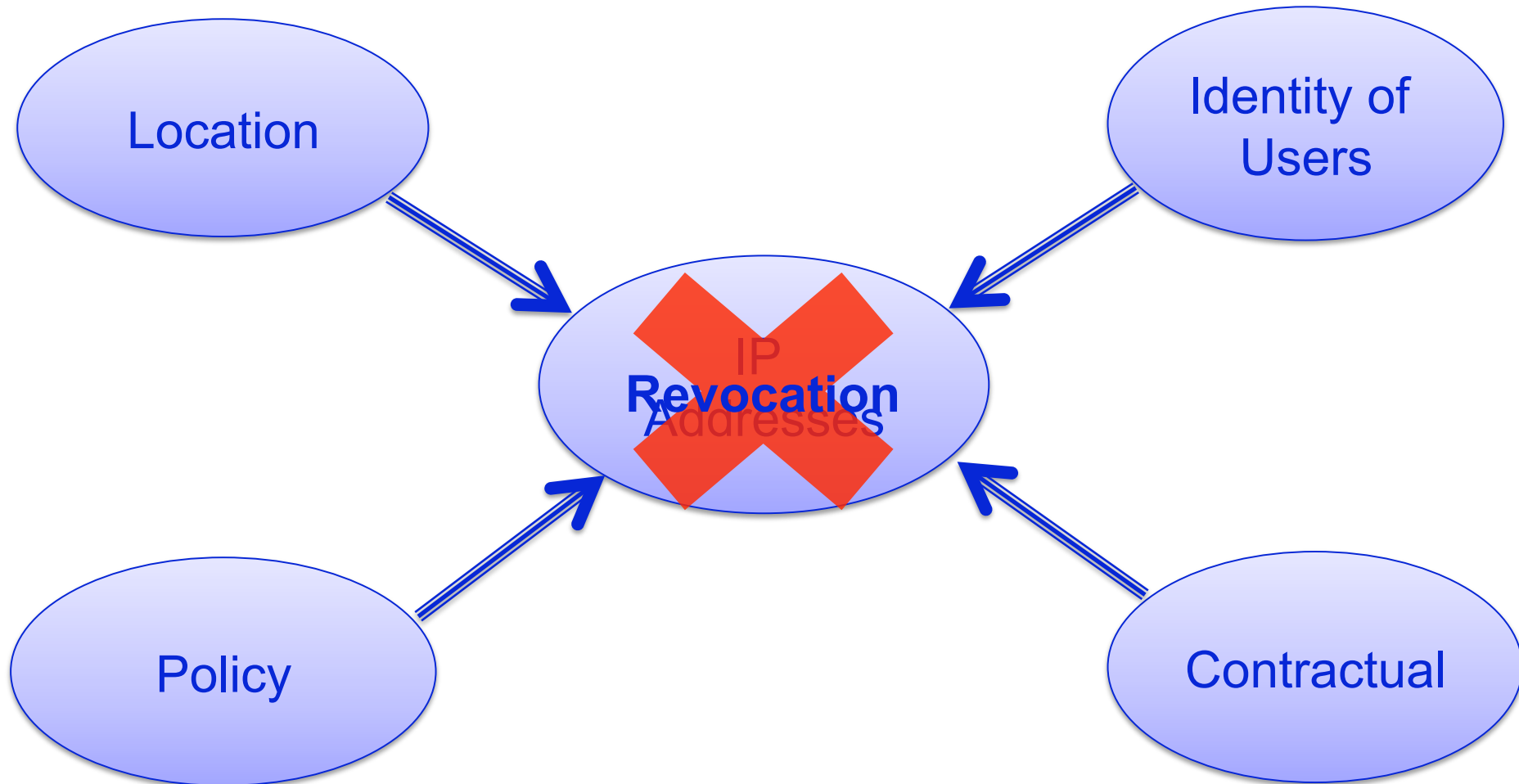
Internet Number Resources (IPs)

- What are Internet Number Resources (INR)?
- Locating Internet Number Resources
- Identifying the User of Internet Number Resources

Legal framework around Internet Number Resources

- Legal framework and the policies (“the law”)
- The revocation of INR / closure of registration

Overview of contents



Basics – what are Internet Number Resources?



Names and Numbers

- www.ripe.net (Domain names)
- 193.0.0.203 (IPv4)
- 2001:610:240:11::c100:1319 (IPv6)
- 3333 (AS number)



Internet Number Resources

“An internet protocol (IP) address is a numeric identifier that includes information about how to reach a network location via the Internet routing system”

An IP address does not give any information on:

- The geographic location of a network or device
- Who is using the IP address
- Why the IP address is in use (the purpose)

Locating Internet Number Resources



Why do people want to locate and identify INR on the internet?

- Giving access to restricted content (e.g. BBC)
 - Denying access to disallowed content (e.g. China)
- Targetted content (e.g. search results, local news/ weather)
- Targetted advertising (e.g. airlines, dating sites)
- Investigating crimes
 - Online crime (Botnets, scams, spams, etc)
 - Real-world crime gone hi-tech (drug smuggling, terrorists, etc)
- Material requirement for asset → location



Restricting access - iPlayer

The screenshot shows the BBC iPlayer website interface. At the top, there is the BBC logo, a search bar, and a 'Text only | Help' link. Below this is a navigation bar with 'iPlayer' and menu items: 'Home', 'TV Channels', 'Radio Stations', 'Categories', and 'A to Z'. The main content area features a video player. The video frame shows two men in a bar setting. A semi-transparent black box is overlaid on the video with the following text:

Currently BBC iPlayer TV programmes are available to play in the UK only, but all BBC iPlayer Radio programmes are available to you. Why?
If you are in the UK and see this message please read this advice.
[Go to Radio channels home page](#)

Below the video player, the text 'EastEnders Thu, 17 Sep 2009' is displayed, along with a 'Programme Information' link. The video player controls at the bottom show a play button, a progress bar at 00:00 / 00:00, and buttons for 'SHARE', volume, and other functions.



Example - Locating 195.29.92.124

 IP Address to locate:

Database Lookup

Your IP address is 195.29.92.124
 City: Opatja
 Country: Croatia
 Continent: Europe
 Time Zone: GMT+1 [more demo?](#)

Insert IP address/Hostname/URL:

Country Code	HR	Country	Croatia
Region Code	HRPG	Region	Primorsko-Goranska
City Code	HRPGKRK	City	Krk
CityId	15018	Certainty	90
Latitude	45.0270	Longitude	14.5770
Capital City	Zagreb	TimeZone	+01:00
Nationality Singular	Croatian	Population	4334142
Nationality Plural	Croats	Is proxy	false
CIA Map Reference	Europe	Currency	Kuna
MapBytes Remaining	Free	Currency Code	HRK

- IP address : 195.29.92.124
- Country : Croatia 🇪🇺
- State/Province : Primorsko-Goranska
- City : Rijeka
- Zip or postal code :
- Latitude : 45.3431
- Longitude : 14.4092
- Timezone : 1
- Gmtoffset : 1
- Dstoffset : 2
- Hostname : 195.29.92.124

IP Address	Country	Region	City	Latitude/Longitude	ZIP Code	Time Zone	
195.29.92.124	CROATIA	PRIMORSKO-GORANSKA	RIJEKA	45.33 14.45	-	+02:00	Map It
	Net Speed		ISP		Domain		
	COMP		ZZJZ RIJEKA		-		
	IDD Code	Area Code	Weather Station				
385	-	HRXX0006 - RIJEKA					

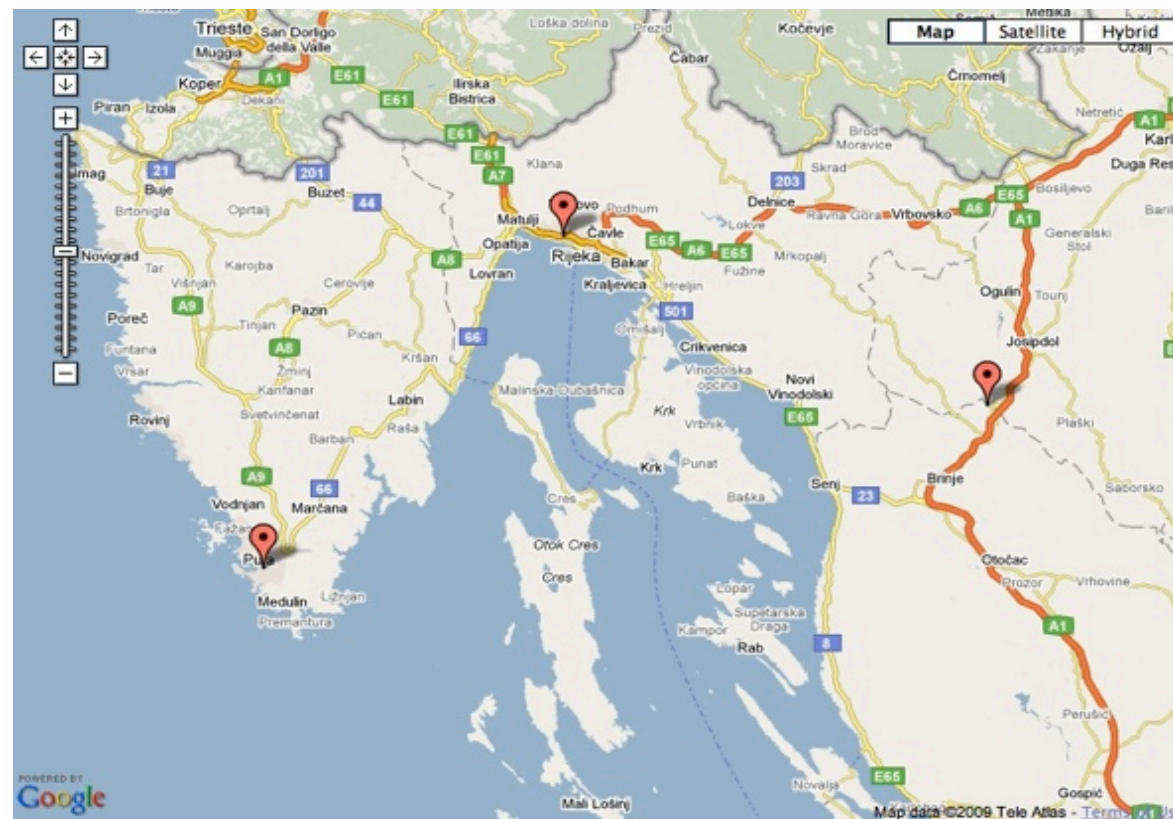


Comparison of geolocation services

Source	Country	City	Latitude	Longitude
GeoLite Country	HR	NA	NA	NA
DNSBL countries.nerd.dk	HR	NA	NA	NA
GeoLite City	HR	Rijeka	45.3431	14.4092
Hostip.info	HR	Pula	44.8683	13.8481

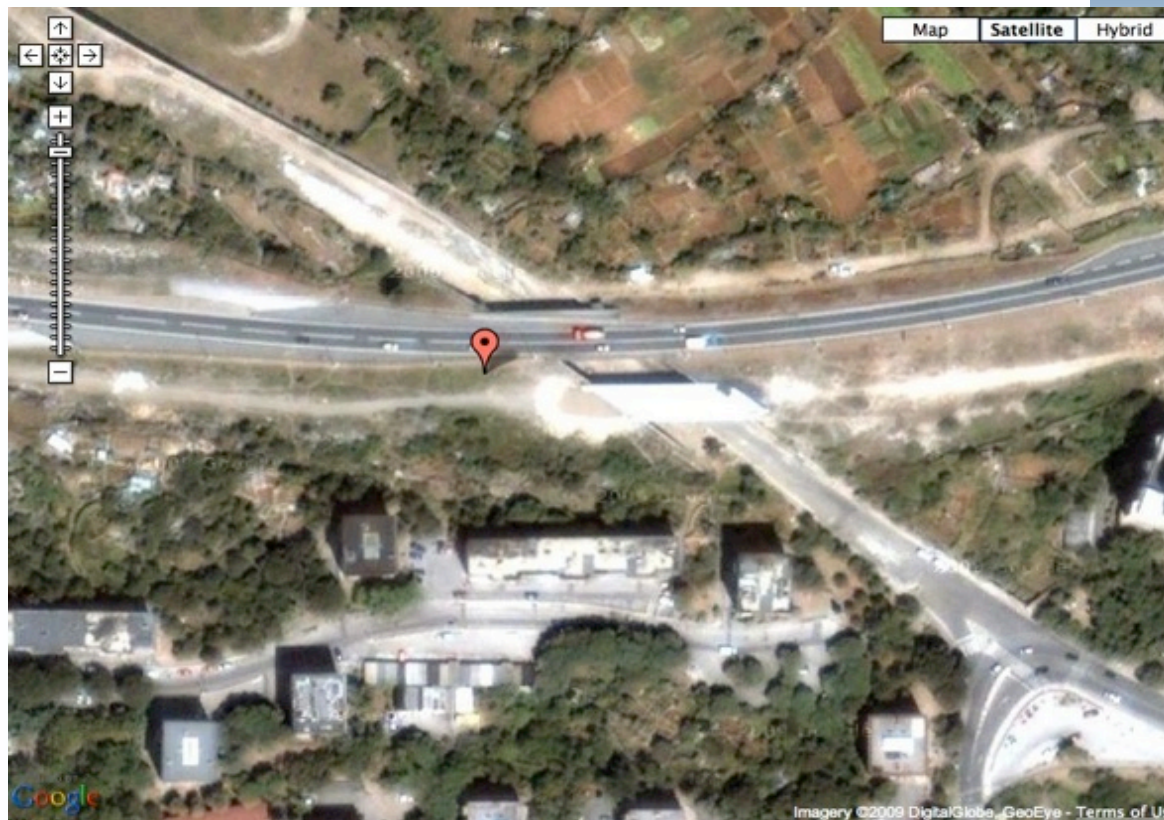
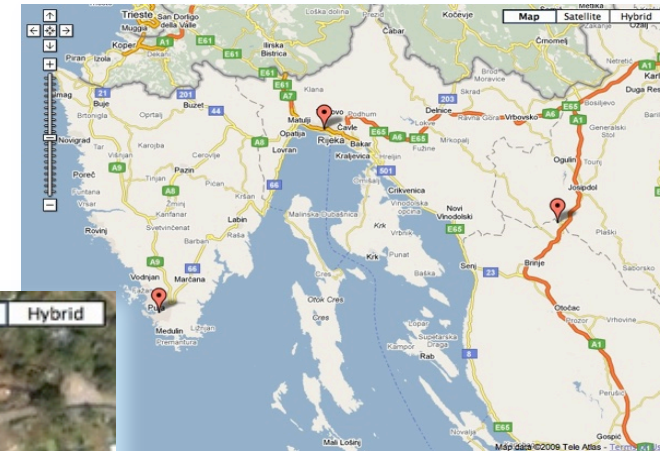
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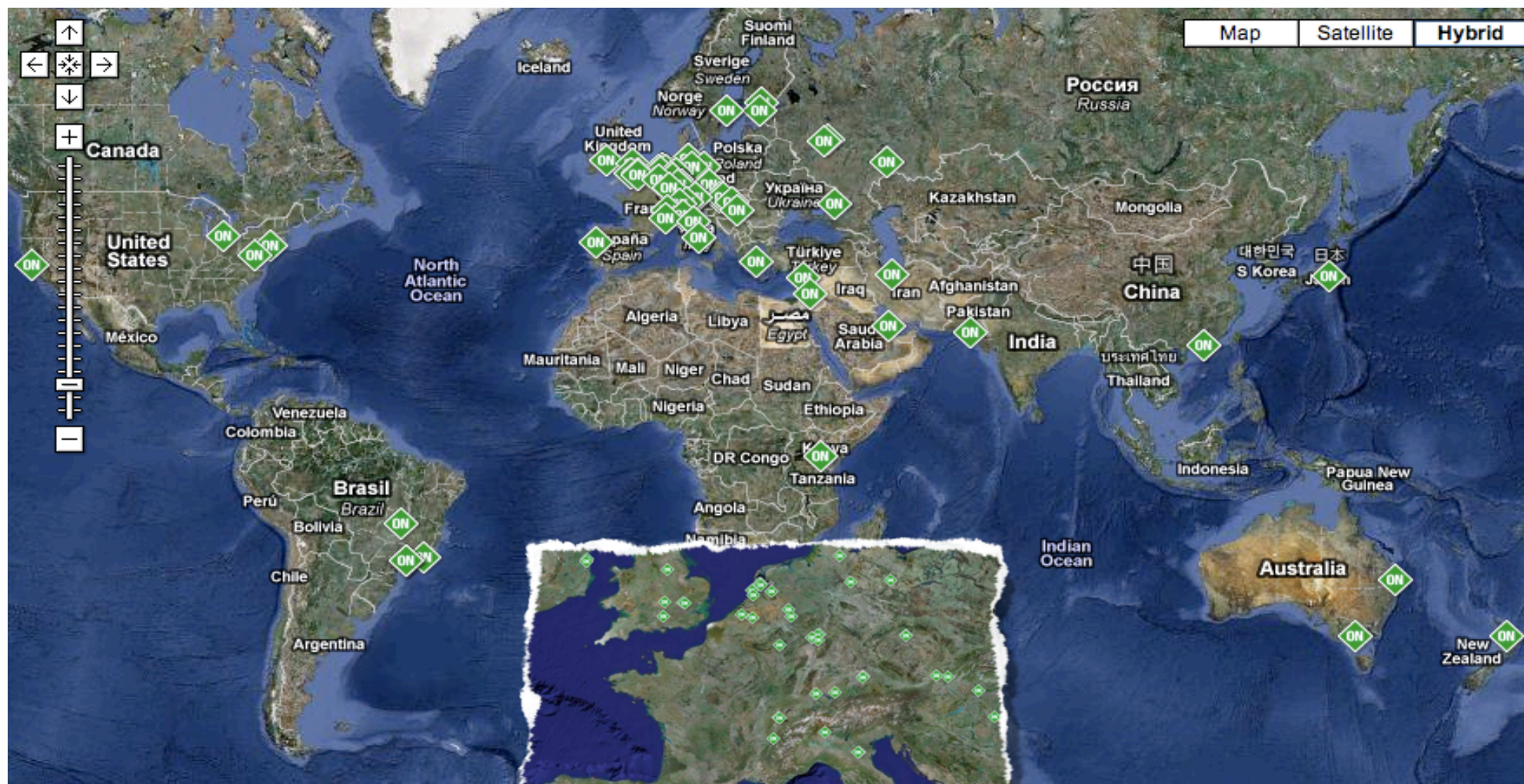
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Another example – TTM GPS Antennas



TTM Location data - Hong Kong





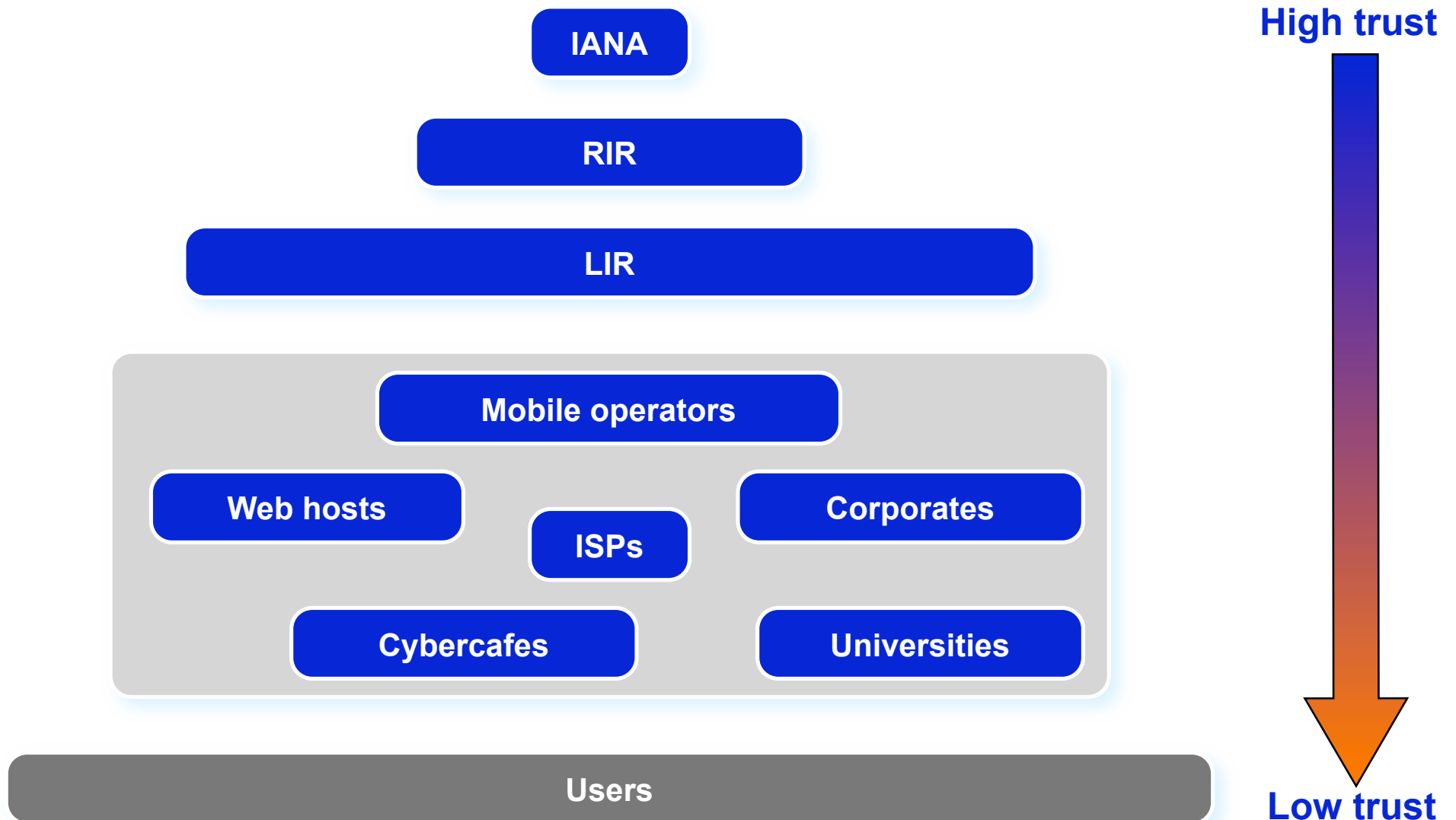
Conclusion

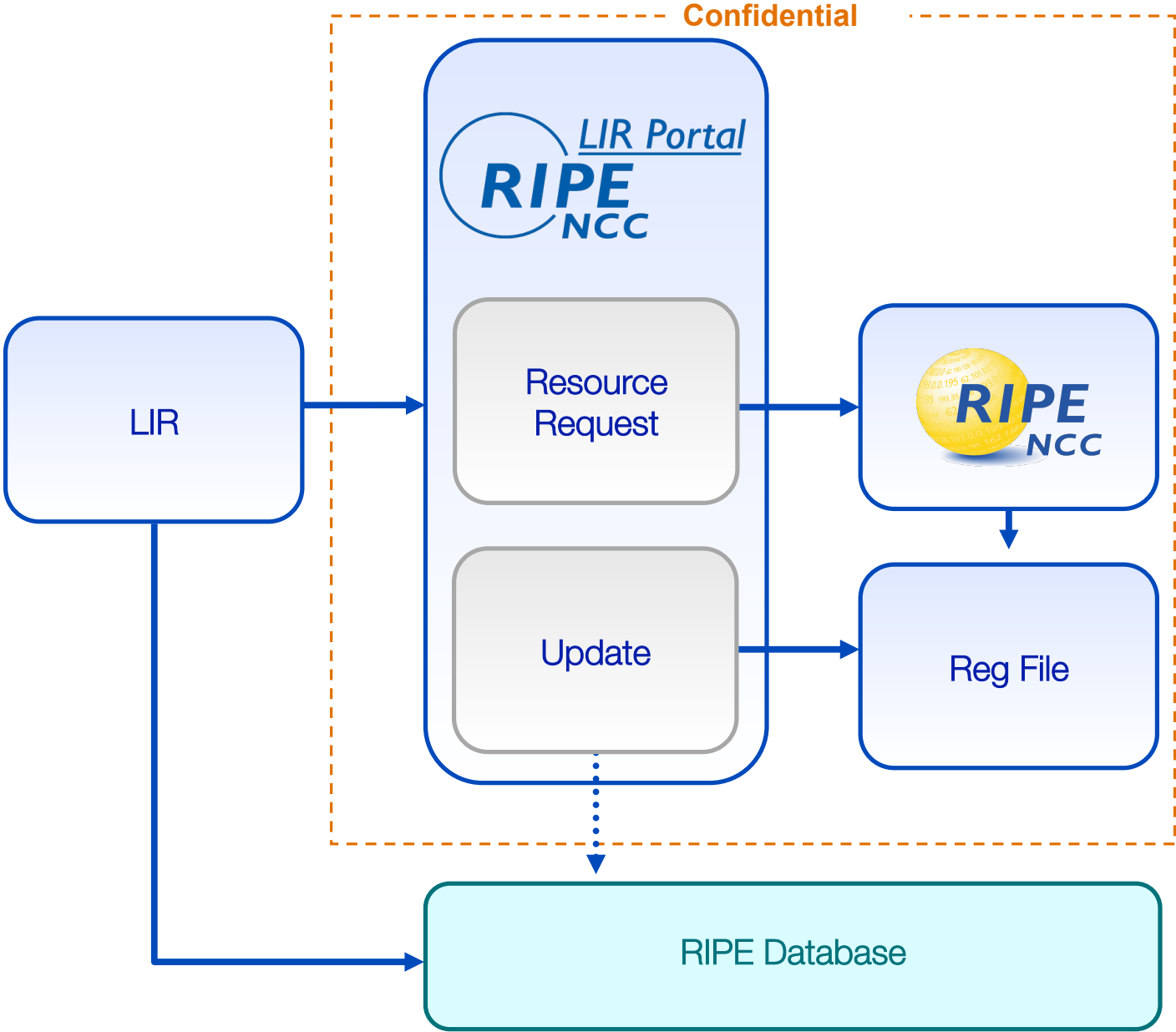
- Physically locating IPs is difficult
- Options to locate or investigate location of an IP:
 1. Follow the wire
 - Analyse the paths at network level
 2. Work your way down in the hierarchy - start with trusted organisations (e.g. RIR, Telco)



Identifying the User of the Internet Number Resource

Hierarchical top-down trust







Conclusion

- Identifying the User even more complicated than locating the User

- Possible to follow “Chain of trust”

IANA → RIR → LIR → ...

Contact “upstreams” of ISP – Contact ISP

- Research possible via RIR Databases and other tools

LIR → DB Maintainer → Customers/Users



Legal framework – “the legislation”



Policy making

- Industry self-regulation
 - Standards – IETF
 - Policies – Reseaux IP Europeen – public policy forum
- Policies made based on consensus on industry needs by public policy forum (RIPE)
- Policies do not have legislative power but are agreements that the LIRs adhere to and the RIPE NCC aims to enforce



Principles of the IP registration policies

- Conservation
“Safeguard efficient use of the finite resource”
- Aggregation
“Consider the impact on the routing of information”
- Uniqueness
“Ensure IP addresses remain unique”



Requirements for IPv4 & IPv6 Allocations

- Be a Local Internet Registry (LIR)

IPv4

- Wants or needs individual addresses
- Size is based on expected use for the course of one year
- Minimum size: /21 (2048 addresses)

IPv6

- Publish the allocation as a prefix
- Plan to make assignments within two years
- Minimum size: /32



Relevant recent RIPE policies

- All Internet Number Resource holders need to have a contractual relationship with the RIPE NCC or via LIR
 - Improved registration of specific Internet Number Resources
 - Improved “Chain of trust”
- Reallocation of INR between LIRs
 - Transfers possible between LIRs
 - Based on need for INR
- Run out policies – dealing with the future run out of IPv4 addresses



Legal aspects of INR and the RIPE NCC

Standard contract with all members, no exceptions

No “lease”
structure in
contract

IP addresses are
allocated based
on need

INR are not
owned, no
property

Upon termination of contract – voluntary return of
resources



Legal aspects of INR

- No comparison with Domain Names- No Intellectual Property Right
- No specific legislation - little jurisprudence
- In US one relevant court case Kremen vs ARIN. Kremen refuses to sign an agreement with ARIN and wants to use INR without an agreement with ARIN
 - Court case focuses on Antitrust – suit dismissed, no appeal
 - Kremen claims ownership, dismissed, claims “right of use”
 - Court confirms the legitimacy of ARIN in INR registration



Conclusion

- Policies made through a transparent, open policy process
- Policies have no legal status – industry standards
- No specific legislation – very little jurisprudence
- With increased complexity and diversity of LIRs - new policies can have more effect on specific groups of LIRs
- Outside industry no familiarity with system

Revocation / transfer of IPs or closure of LIRs



Reclamation and transfers of INR

“Reclamation” & transfers of INR

- On what grounds is it possible to reclaim / revoke?
- Can it be enforced?
- What are the consequences for the User?
- What is actually being reclaimed or transferred?
- How can we fit this in a legal framework?



On what grounds closure of LIR (membership)

- Voluntarily termination of agreement
- Non Payment of annual service fees
- No adherence to RIPE policies - negative audit
- If the member fails to observe a rule of applicable law



Legal aspects of LIR (member) closure

- “Closure” of LIR is difficult
- “Reclamation” of INR is only partly possible
- Possible actions the RIPE NCC can take to change the “Routability”:
 - Change “maintainer” on RIPE Database record
 - Remove the RIPE Database record
 - Remove Reverse DNS allocation
 - Move INR record to the “RIPE NCC free pool”
 - Publish “reclaimed” INR
- INR can still be in use



Conclusion – Internet Number Resources asset?

- No object – no materiality requirement
- No exclusive control by User – no human control
- No asset
- No Intellectual Property Right
- No specific legislation - little jurisprudence
- Right of use only follows from agreed principles no legal backing or forced routability
- Revocation / reclamation difficult based on cooperation

Questions?



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