

# GURL

Geolocation Using Reverse Lookup



# GURL: status

Current Status:

This is the first presentation of GURL.  
YOU are the guinea pig audience.

IETF status: none. IDs: none

Why am I here ?

Because I want your feedback

# GURL: short demo

My IP: 50.1.8.254

```
nslookup -type=PTR 254.8.1.50.in-addr.arpa  
arneill-py.sacramento.ca.us
```



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nslookup -type=PTR 254.8.1.50.in-addr.arpa  
arneill-py.sacramento.ca.us
```

```
nslookup -type=TXT 254.8.1.50.in-addr.arpa  
"geoloc: <lat> 38.55 </lat> <long> -121.48  
</long> <city> Sacramento </city> <stpr>  
$ CA </stpr> <country> USA </country>"
```

# GURL: requirements

How does this work? Server side



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- ▶ Nothing magic. A TXT RR in the in-addr.arpa zone



# GURL: requirements

How does this work? Server side

- ▶ Nothing magic. A TXT RR in the in-addr.arpa zone
- ▶ Modifications do the DNS server software: none

# GURL: requirements

How does this work? Client side



# GURL: requirements

How does this work? Client side

▶ Troubleshoot: nslookup / dig



# GURL: requirements

How does this work? Client side

- ▶ Troubleshoot: nslookup / dig
- ▶ Nice presentation: it's just pseudo-XML text to parse

# GURL: requirements

What is missing ?

Management Tools. So far, the management tool is vi



# GURL: tags

<lat> <long> <city> etc.

Can that be changed ?

- ▶ Absolutely, these are merely suggestions
- ▶ Based on needs

# GURL: goals

What it is meant to replace

- ▶ RFC 1876 (LOC RR)



# GURL: goals

What it is meant to replace

- ▶ RFC 1876 (LOC RR)

Why ?

- ▶ RFC 1876 is domain-based (forward lookup) and too complicated. The domain zone and the in-addr.arpa zone may be administered by different entities

# GURL: simplicity

RFC 1876: In which state is IP address  
50.1.8.254 ?



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- ▶ 1. Query in-addr.arpa for PTR RR



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RFC 1876: In which state is IP address 50.1.8.254 ?

- ▶ 1. Query in-addr.arpa for PTR RR
- ▶ 2. Query the PTR matching-domain for a LOC RR

# GURL: simplicity

RFC 1876: In which state is IP address 50.1.8.254 ?

- ▶ 1. Query in-addr.arpa for PTR RR
- ▶ 2. Query the PTR matching-domain for a LOC RR
- ▶ 3. Decode GPS coordinates from LOC RR

# GURL: simplicity

RFC 1876: In which state is IP address 50.1.8.254 ?

- ▶ 1. Query in-addr.arpa for PTR RR
- ▶ 2. Query the PTR matching-domain for a LOC RR
- ▶ 3. Decode GPS coordinates from LOC RR
- ▶ 4. Run coordinates through software that returns the state

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50.1.8.254 ?

- ▶ 1. Query in-addr.arpa for TXT geoloc: RR



# GURL: simplicity

GURL: In which state is IP address 50.1.8.254 ?

- ▶ 1. Query in-addr.arpa for TXT geoloc: RR
- ▶ 2. Parse TXT geoloc: RR



# GURL: simplicity

GURL: In which state is IP address  
50.1.8.254 ?

- ▶ 1. Query in-addr.arpa for TXT geoloc: RR
- ▶ 2. Parse TXT geoloc: RR

▶ **DONE!**

# GURL: RR type

Why use a TXT RR ?



# GURL: other ways

## ▶ Geoloc info embedded in the PTR.

- `anancy-151-1-215-34.w83-194.abo.wanadoo.fr`
- `mor91-1-89-82-22-219.dsl.club-internet.fr`

## ▶ No standard

# GURL: other ways

- ▶ Web-based APIs
- ▶ Too many competing ones



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Why use a TXT RR ?

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- ▶ If this GURL gets traction, a new RR type is the way to go and will be requested

# GURL: RR type

Why use a TXT RR ?

- ▶ The IETF (RFC 5507) now recommends to register a new RR type
- ▶ If this GURL gets traction, a new RR type is the way to go and will be requested
- ▶ We are not even in the bootstrap phase, so for now TXT is the way to go

# GURL: RR type

Why use a TXT RR ?

▶ Recent history: SPF



# GURL: RR type

Why use a TXT RR ?

- ▶ Recent history: SPF
- ▶ Started as TXT



# GURL: RR type

Why use a TXT RR ?

- ▶ Recent history: SPF
- ▶ Started as TXT
- ▶ As of today, even if the SPF RR has been registered (99), it is not yet widely available

# GURL: challenges

Status of RFC 1876 deployment:

- No significant adoption



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Why ?

- No stick and no carrot



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Why ?

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Is GURL going to be successful over RFC 1876 because it is simpler ?

- Probably not without some additional carrot

# GURL: challenges

Who would configure GURL ?

- Geeks with static IPs



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- Geeks with static IPs
- Enterprises who have been delegated reverse lookup for their space
- ISPs

# GURL: challenges

Who would configure GURL ?

- Geeks with static IPs
- Enterprises who have been delegated reverse lookup for their space
- Adoption needs to focus on ISPs

# GURL: challenges

Who needs geolocation by IP ?

- ▶ Geeks who want a visual traceroute



# GURL: challenges

Who needs geolocation by IP ?

- ▶ Geeks who want a visual traceroute
- ▶ Targeted ads

# GURL: ads

- ▶ Looking for coffee in Santa Rosa



# GURL: ads

- ▶ Looking for coffee in Santa Rosa
- ▶ Wrong time zone
- ▶ Looking for pizza and beer in Santa Rosa



# GURL: ads

- ▶ Looking for coffee in Santa Rosa
- ▶ Wrong time zone
- ▶ Looking for pizza and beer in Santa Rosa
- ▶ Wrong city
- ▶ Looking for pizza and beer in Sunnyvale

# GURL: DNS geo load balancing

Can GURL be used to enhance DNS load balancing ?



# GURL: DNS geo load balancing

Can GURL be used to enhance DNS load balancing ?

- ▶ Yes, BUT...
- ▶ Not as the primary discriminator. A good load balancing chooses the “closest” server, but this is from a network point of view, not a geographic point of view

# GURL: DNS geo load balancing

Can GURL be used to enhance DNS load balancing ?

- ▶ This means understanding of the network topology, which is a routing (BGP) animal not a DNS animal

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Can GURL be used to enhance DNS load balancing ?

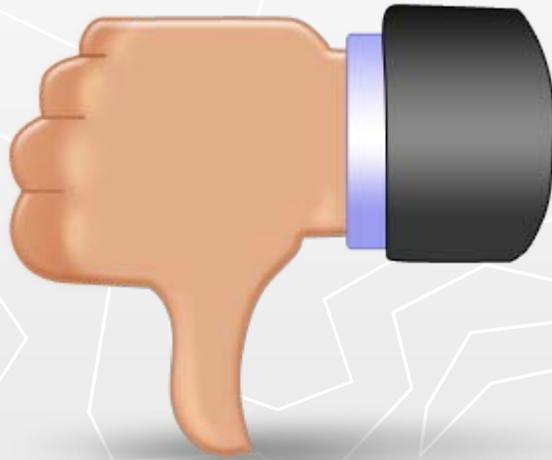
- ▶ This means understanding of the network topology, which is a routing (BGP) animal not a DNS animal
- ▶ In short: Best routing path first, then use geoloc as 2<sup>nd</sup> discriminator

# GURL: impact on large-scale prod

▶ YOU tell me!



# GURL: what's next ?



# GURL: what's next ?



# GURL: Thank you

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