

# Name-to-Thing (N2T) Resolver Update

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# Why Name-to-Thing (N2T)?

Challenge: current id resolver systems are risky, expensive, exclusionary, and incomplete

*Name-to-Thing* is safe, cheap, id scheme-agnostic, and it addresses a superset of the problem addressed by URN, DOI, & Handle

Origin: first presented at DLF panel on global id resolvers November 2006

# Name-to-Thing (N2T) overview

Establish a consortium and a small web server

Each member publishes URLs under n2t.info:

<http://n2t.info/12345/foo/bar.zaf>

...which redirects to member 12345's server

The URL is *protected* from local server name instability  
(but not from local server stupidity)

N2T registers member number + local server URL

- 200 members supported by 200 rewrite rules
- 4-6 members volunteer host mirrored N2T servers

# N2T – user point of view

Each consortium member organization gets a unique number, such as, 12345.

http://n2t.info/12345/fo~~o~~/bar.zaf

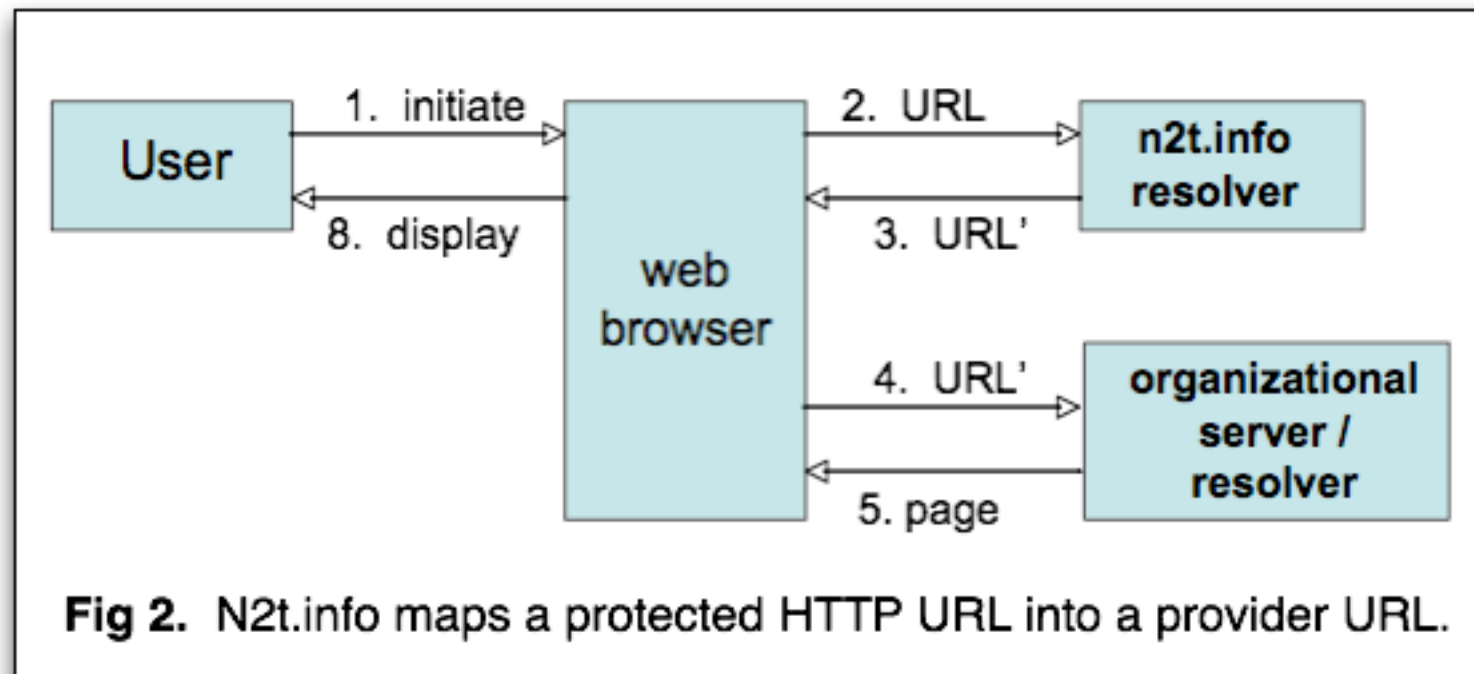


http://www.example.org/fo~~o~~/bar.zaf

**Fig 1.** A protected URL is forwarded to a provider currently serving things named by organization 12345. The *path part* is left alone.

# N2T – system point of view

Technically, resolution (access to a thing given its name) is simple redirection.



# N2T as consortium

No one organization owns the brand

- Everyone owns it

Nearly free?

- \$30/year rents the n2t.info domain
- Volunteers maintain 200 rewrite rules

Consortium as successor safety net?

- An organization that can no longer operate can look among members for a successor

# n2t.info summary

- Persistent identifier resolution using a very simple architecture
- No proprietary, special-purpose infrastructure to carry forward as a liability to persistence
- No browser modification required
- Identifier scheme-agnostic

# Current status

Experiment with 4 mirrored resolvers

- CDL (Mark Reyes, John Kunze)
- NYU (Rasan Rasch, James Bullen)
- State and University Library, Göttingen (Markus Enders, Stefan Funk, Jens Ludwig)
- National Library of Australia (Mark Triggs, Judith Pearce)

Göttingen Nestor Workshop: “Trustworthiness and Interoperability of Persistent Identifiers and Resolvers” (this week 9 Nov 2007)



# N2T implementation and mirroring

Uses Noid, a BerkeleyDB-based minter/resolver

- Initially, rsync the entire (small) database
- Eventually, use the BerkeleyDB replication manager
- Same endianness is a requirement in both cases
- Differences between Linux and Solaris rewrite behavior

Security concerns, all ssh-based authentication

- Policies that prohibit ssh access (eg, rsync push)
- Escrow machine for “pull”
- “Pull” from port 80 as privacy is not a concern

# N2T and branding

The resolver (redirecting server) is at n2t.info

- *n2t.info* is short, good for usability
- *n2t* is reasonably opaque and non-branded, good for longevity

Accommodating branding *and* longevity?

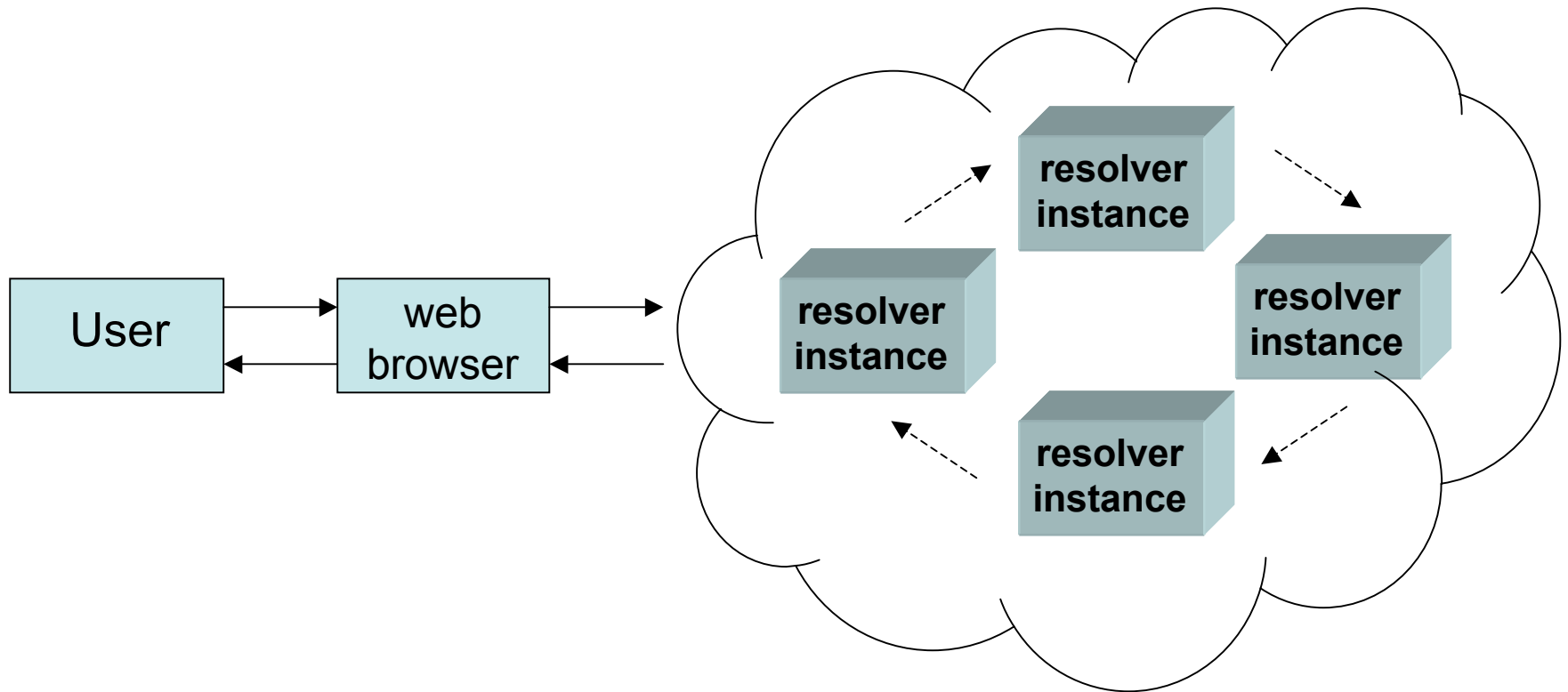
<http://n2t.info/12148/wt8gh2br> ?

<http://n2t.bnf.fr/12148/wt8gh2br> ?

<http://bnf.n2t.info/12148/wt8gh2br> ?

# N2T – global point of view

Regional (eg, Europe, Asia, North America) clusters of mirrored resolver instances, with round-robin failover for redundancy, fault-tolerance, and load-sharing



# Global server load balancing

How to do GSLB cheaply and effectively

- Anycast?
- Multiple DNS A (Address) Records?

Achieving high availability

- Or is it strictly necessary?

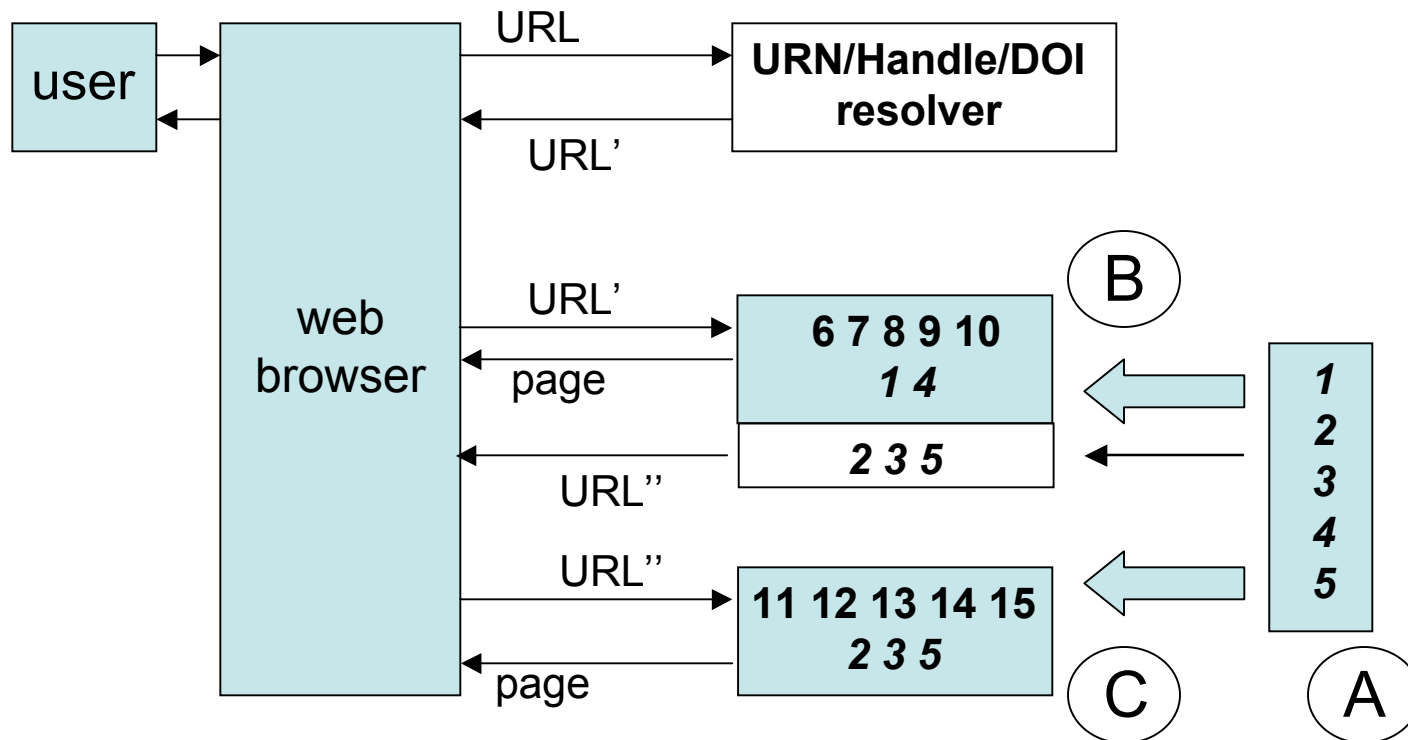
# N2T and multiple id schemes

All depend on Name Assigning Authority

- <http://n2t.info/NAA/...>
- <http://n2t.info/ark:/NAA/...>
- <http://n2t.info/urn:NAA:...>
- <http://n2t.info/hdl:NAA/...>
- <http://n2t.info/doi:NAA/...>
- <http://n2t.info/purl:/NAA/...>

Where to register NAA number (eg, 12345)?

# Namespace Splitting Problem

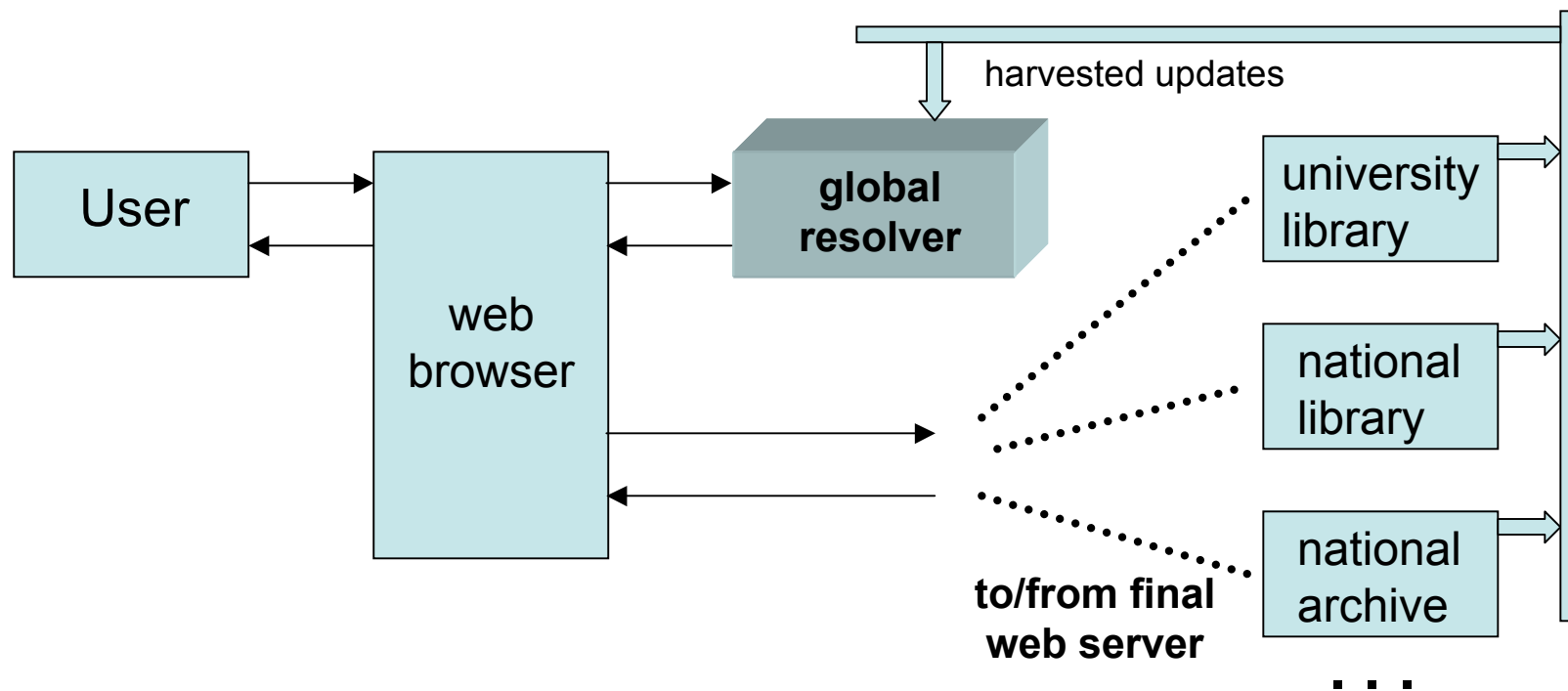


Org'n A's namespace splits when B and C inherit its objects. Under the URN/Handle/DOI model, B must still forward to C. A table is needed where it can be supported, e.g., N2T.

# Global resolver updating

But to become a per-object resolver needs bulk updates

- Periodic harvest (e.g., daily) of table mappings
- From well-known provider-side web server files, e.g., tools and conventions similar to Google sitemaps



# Prototype resolver

## Sample identifiers at n2t.info

<http://n2t.info/12345/libraries/visitor.html>

<http://n2t.info/13030/inside>

<http://n2t.info/urn:nbn:se:uu:diva-3324>

<http://n2t.info/ark:/13030/tf5p30086k>

Can also redirect all URNs, DOIs, and Handles,  
such as,

<http://n2t.info/doi:10.1111/j.0307-6946.2004.00571.x>