Beyond the Single Resource Directory

draft-amsuess-core-rd-replication,
draft-amsuess-t2trg-rdlink

Christian Amsüss

2019-03-26

Context

`draft-amsuess-core-rd-replication`
: Presented at IETF101 in CoRE

`draft-amsuess-t2trg-rdlink`
: Nascent project for thing-to-thing usable URIs without central infrastructure

Ground work: document structure

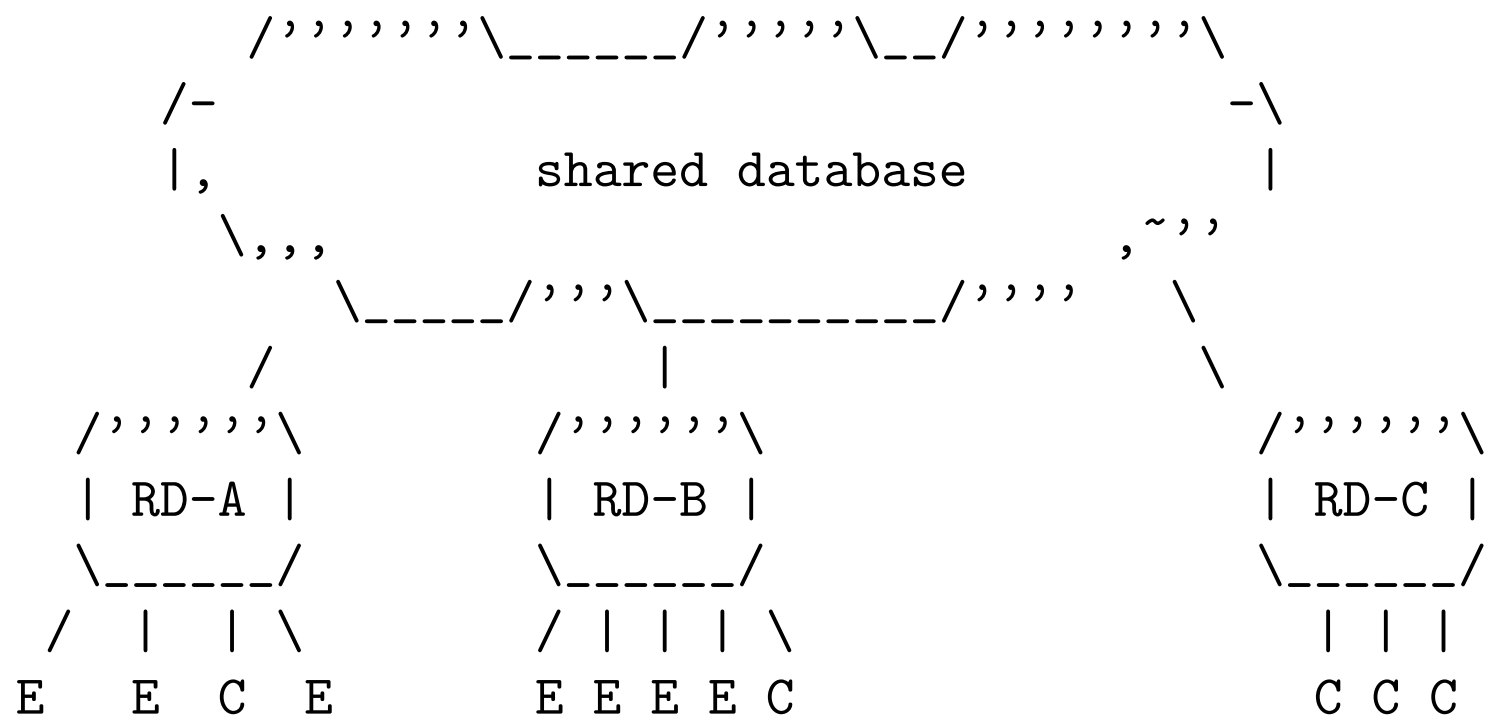
Resource Directory upscaling

goals, challenges, patterns

Ground work: RD replication

Single registration URI

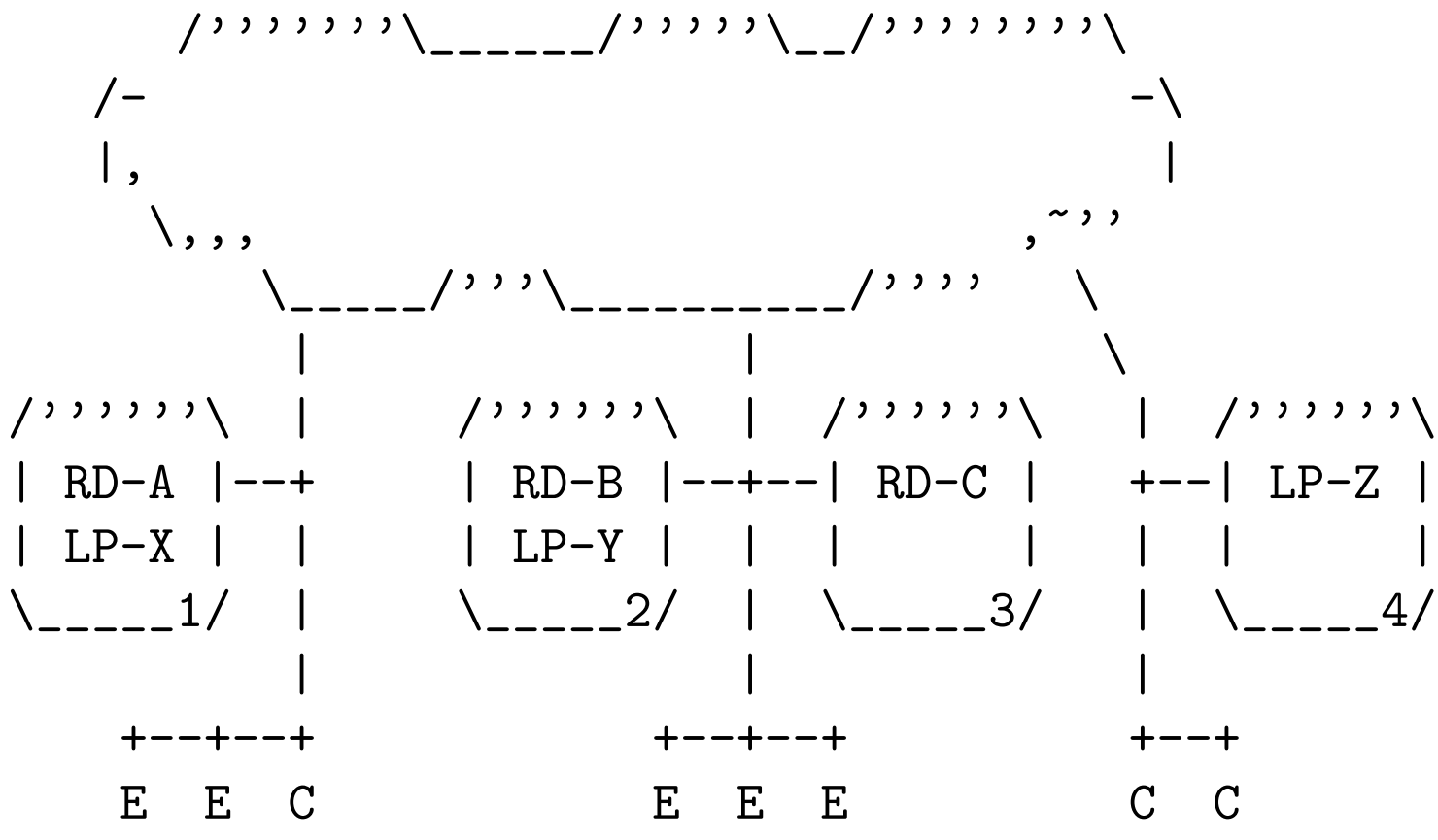
Shared authority



Ground work: RD replication

Distinct registration URIs (multi-/anycast or location-based DNS)

Proxy lookups

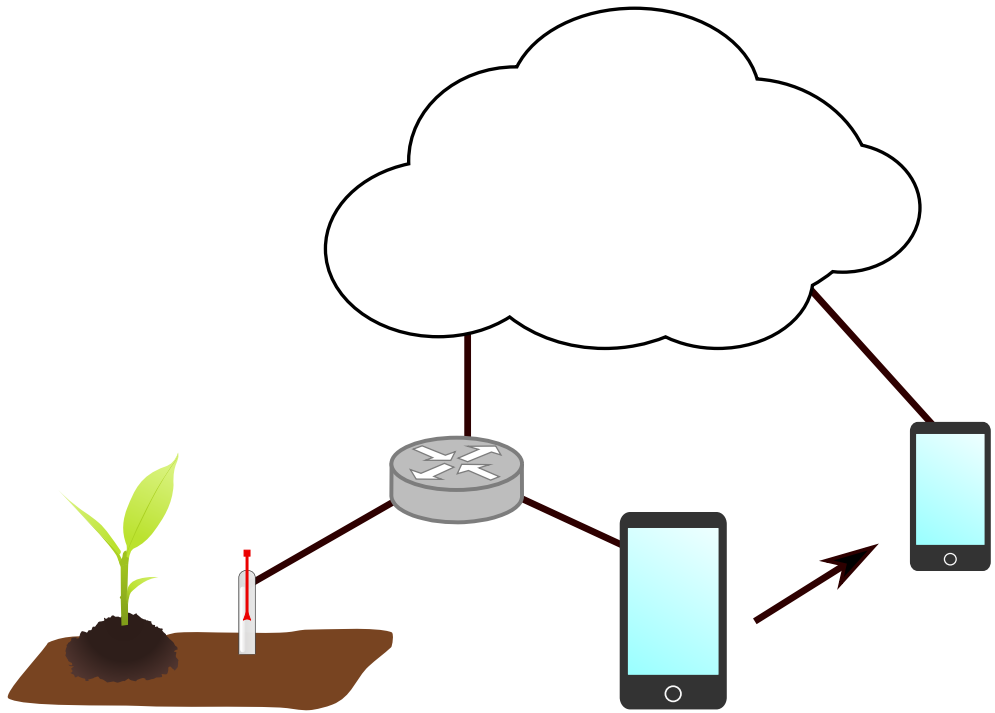


Ground work: Topics

- Failover for lookups
- Failover for registrants
- Lookup load balancing
- Registration load balancing
  even though that's only an issue with extensions

And Now for Something Completely Different

rdlink: Motivation



`coaps://wither-be-gone.local/am-i-green?`

rdlink: Address properties

- Stable

  as long as the server wants them to be
- Resolvable

  from where the server wants them to be
- Usable for end-to-end secure communication

and not increase constrained device code size at all

rdlink

Robust Distributed Links to IoT devices
Also, links assisted by a Resource Directory

rdlink: Addresses

will be defined in CoRE

indicating other mechanism required

`coap+at://nbsw···3de.ab.rdlink.arpa/green`

base32-encoded raw public key or other cryptographic identifier

rdlink: Lookup

- Link-local protocol negotiation multicasts
- DHT lookup of the authority

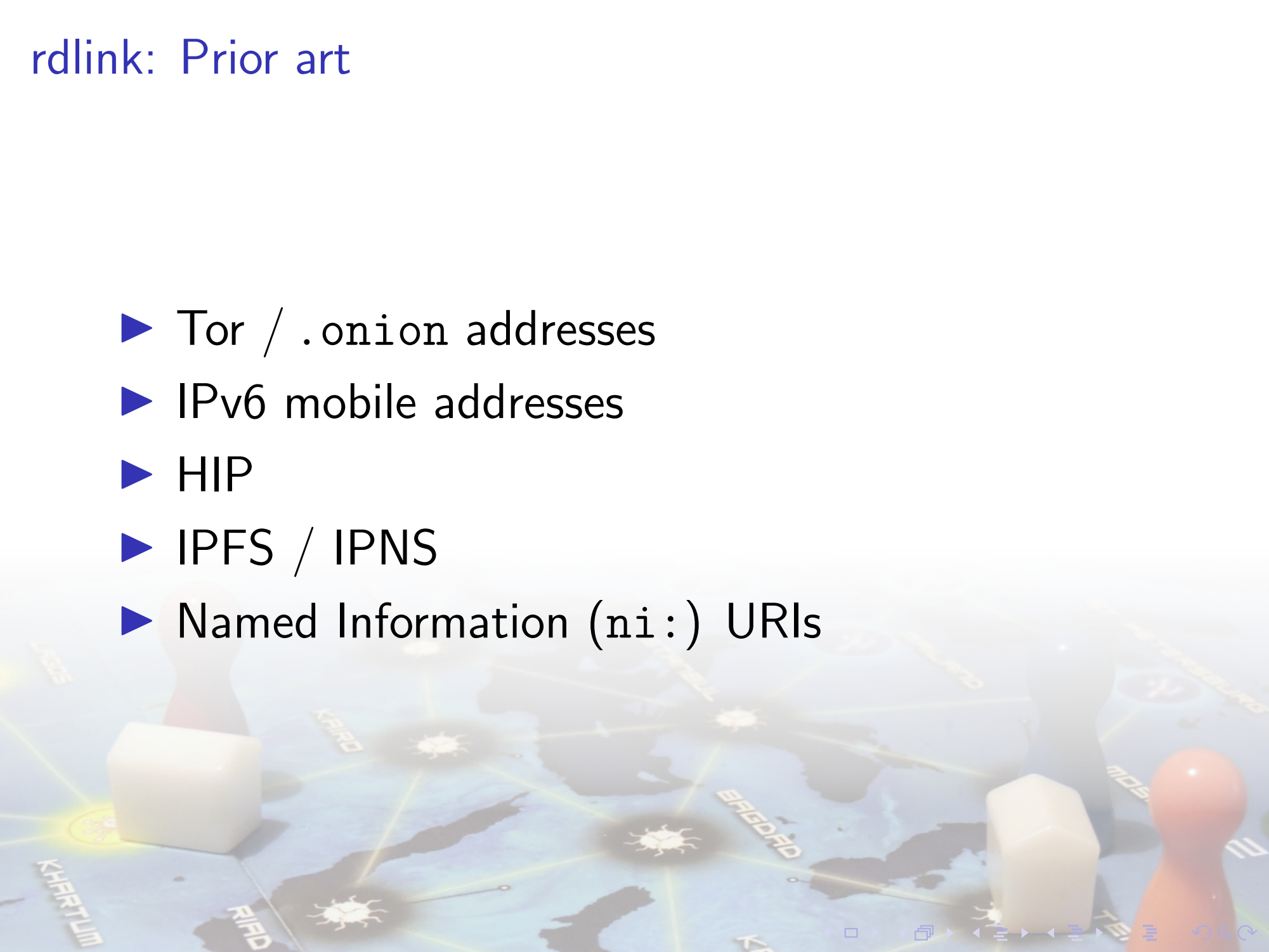
rdlink: Lookup

- Link-local protocol negotiation multicasts
- DHT lookup of the authority

  assisted by helper servers that implement a distributed Resource Directory

rdlink: Prior art

- Tor / `.onion` addresses
- IPv6 mobile addresses
- HIP
- IPFS / IPNS
- Named Information (`ni:`) URIs



rdlink: Roadmap towards implementation

- Prerequisites from CoRE

  `protocol-negotiation`, `coap+at`
- Prototypes
- Operations

  How is a `.arpa` domain run? Who else will run helpers?
- Review
- Usable in off-the-shelf IoT devices by 2023

Questions to RG, next steps

- General ideas and feedback
- Right place here?

  And with whom else will this need to be coordinated?
- Your requirements
- Your use cases
- Your participation