

IPv4 Address literal in URL

draft-osamu-v6ops-ipv4-literal-in-ural

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Background

- IPv6 only environment with DNS64/NAT64 works well.
 - We can access to IPv4 serveries through the NAT64.
(except application which has a protocol level issues like a VPN)
- BUT
 - We don't have general mechanisms of translating to IPv6 address with NAT64 prefix from "literal IPv4 address" !!
 - Following ID in RFC ed queued (I missed)
- <http://tools.ietf.org/html/draft-ietf-behave-nat64-learn-analysis-03> (in RFC Ed queue)
- <http://tools.ietf.org/html/draft-ietf-behave-nat64-discovery-heuristic-17> (in RFC Ed queue)

Literal IPv4 Address

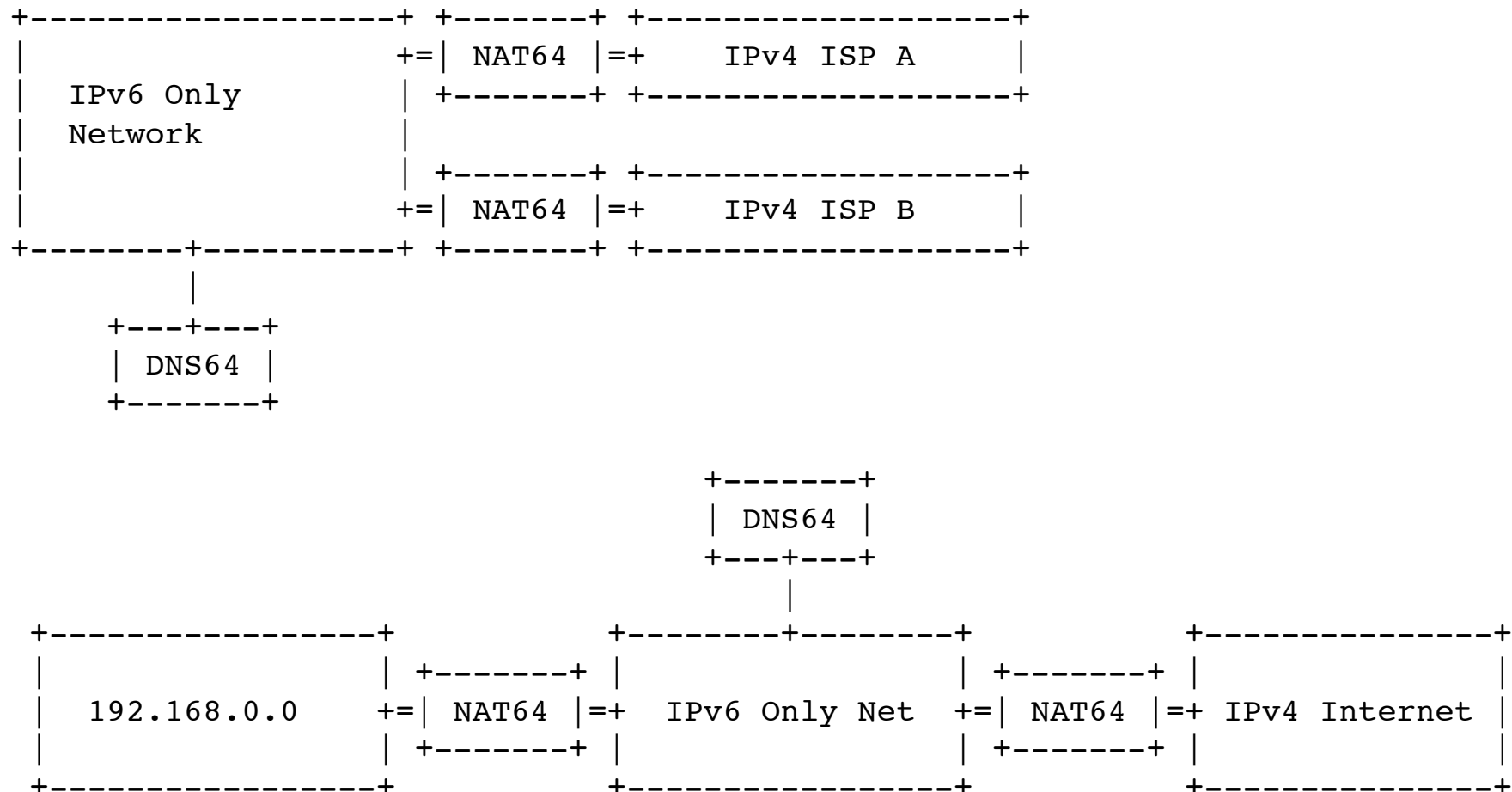
- Literal IPv4 address appear on
 - During network operation, we Telnet-ed/ssh-ed to the host interface
 - % ssh 192.0.2.10
 - % ping 192.0.2.10
 - % traceroute 192.0.2.10
 - URL in Web Page
 - Some web page contain the URL with literal IPv4 address on several HTML tags.
 - Specify the resource location with literal IPv4 address in human communication
 - Friend say “please download the file from 192.0.2.10” in email.

How to find NAT64 prefix

- Use IPv4-Compatible IPv6 address
- Probing IPv4-only anchor host
- Extending DHCP(draft-wing-behave-learn-prefix-04)

- Need library and/or protocol extension.
- Not work on multiple NAT64 environment.

Multiple NAT64 Environment



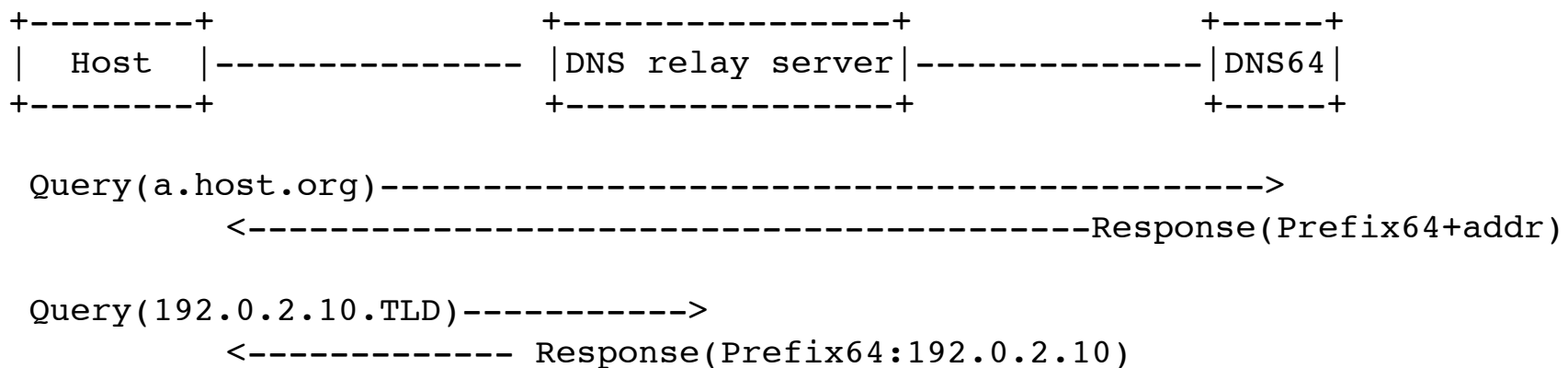
Proposed method

- Attached the special-use TLD to Literal IPv4 address
192.0.2.10.TLD
- Query to DNS64 as regular FQDN
- DNS64 response IPv6 address with appropriate NAT64 prefix

- No modify the application, OS library and protocols
- No special tools for synthesis IPv6 address with NAT64Prefix on local host
- the DNS server (or DNS relay server) have to modified to handle the special use TLD.

DNS64 relay server solution

- DNS64 relay server relays normal query to DNS64 server
- If query with special TLD, DNS64 relay server responses IPv6 address with NAT64 prefix



How to use

- In human interaction like a CLI, just added special TLD to literal IPv4 address

e.g.

```
% ping 192.0.20.2.TLD
```

- In web documents, extension adds to web browser for handling literal IPv4 address

Sample extension for Google Chrome

```
var wr = chrome.webRequest;

var v4Suffix = ".TLD";
var ipAddrRegex = /^(\\d|[01]?\\d\\d|2[0-4]\\d|25[0-5])\\. (\\d|[01]?\\d\\d|2[0-4]\\d|25[0-5])\\. (\\d|[01]?\\d\\d|2[0-4]\\d|25[0-5])\\. (\\d|[01]?\\d\\d|2[0-4]\\d|25[0-5])$/;

function onBeforeRequest(details) {
  var tmpuri = new URI(details.url);
  var tmphost = tmpuri.host();
  var finalUri = "";
  tmphost.replace(ipAddrRegex,function(str, p1, p2, p3, p4, offset, s){
    finalUri = tmpuri.host(p1+"."+p2+"."+p3+"."+p4+v4Suffix).toString();
  });
  if(" != finalUri) {
    console.log(finalUri);
    return {redirectUrl: finalUri};
  }
};

wr.onBeforeRequest.addListener(onBeforeRequest, {urls: ["https://*/**", "http://*/**", "ftp://*/**"]}, ["blocking"]);
```

Discussion

- Is this propose method useful ?
- we should discuss about special-use TLD.
 - Like a 192.0.20.2.ipv4only.arpa
- Should we discuss with DNS working group.