Ruby - Feature #3835

Resolv::DNS: Retry via TCP on truncated UDP response

09/16/2010 05:48 AM - julian.mehnle (Julian Mehnle)

Status:	Closed	
Priority:	Normal	
Assignee:		
Target version:		

Description

=begin
Resolv::DNS has code implementing DNS queries via TCP, but it is not currently used at all. Furthermore, any truncated responses received via UDP are parsed and intact RRs are used, silently discarding any truncated RRs. E.g.:

```
$ dig amazon.com TXT
;; Truncated, retrying in TCP mode.

; <<>> DiG 9.6.1-P3 <<>> amazon.com TXT
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 1197
;; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;amazon.com.                    IN      TXT

;; ANSWER SECTION:
amazon.com.             3592    IN      TXT     "spf2.0/pra ip4:207.171.160.0/19 ip4:87.238.80.0/
21 ip4:72.21.193.0/24
                                                ip4:72.21.196.0/22 ip4:72.21.208.0/24 ip4:72.21.2
05.0/24
                                                ip4:72.21.209.0/24 ip4:194.154.193.200/28 ip4:194
.7.41.152/28
                                                ip4:212.123.28.40/32 ip4:203.81.17.0/24 ~all"
amazon.com.             3592    IN      TXT     "v=spf1 ip4:207.171.160.0/19 ip4:87.238.80.0/21 i
p4:72.21.193.0/24
                                                ip4:72.21.196.0/22 ip4:72.21.208.0/24 ip4:72.21.2
05.0/24
                                                ip4:72.21.209.0/24 ip4:194.154.193.200/28 ip4:194
.7.41.152/28
                                                ip4:212.123.28.40/32 ip4:203.81.17.0/24 ~all"

;; Query time: 0 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Wed Sep 15 20:21:49 2010
;; MSG SIZE  rcvd: 516
```

With an unpatched 1.9.2 Resolv::DNS:

```
>> pp Resolv::DNS.new.getresources('amazon.com', Resolv::DNS::Resource::IN::TXT); nil
[#<Resolv::DNS::Resource::IN::TXT:0x0000000143b0b0
  @strings=
   ["spf2.0/pra ip4:207.171.160.0/19 ip4:87.238.80.0/21 ip4:72.21.193.0/24 ip4:72.21.196.0/22
    ip4:72.21.208.0/24 ip4:72.21.205.0/24 ip4:72.21.209.0/24 ip4:194.154.193.200/28 ip4:194.7.41.
152/28
    ip4:212.123.28.40/32 ip4:203.81.17.0/24 ~all"],
  @ttl=2185>]
=> nil
```

The attached patch changes Resolv::DNS#each_resource to check UDP responses for truncation and retries via TCP, which is the proper behavior per RFC 1123, section 6.1.3.2 http://tools.ietf.org/html/rfc1123#page-75 and implemented by most resolver libraries.

Effect:

```
 >> pp Resolv::DNS.new.getresources('amazon.com', Resolv::DNS::Resource::IN::TXT); nil
 [#<Resolv::DNS::Resource::IN::TXT:0x0000000214adf0
   @strings=
    ["spf2.0/pra ip4:207.171.160.0/19 ip4:87.238.80.0/21 ip4:72.21.193.0/24 ip4:72.21.196.0/22
     ip4:72.21.208.0/24 ip4:72.21.205.0/24 ip4:72.21.209.0/24 ip4:194.154.193.200/28 ip4:194.7.41.
152/28
     ip4:212.123.28.40/32 ip4:203.81.17.0/24 ~all"],
   @ttl=2237>,
  #<Resolv::DNS::Resource::IN::TXT:0x0000000214a580
   @strings=
    ["v=spf1 ip4:207.171.160.0/19 ip4:87.238.80.0/21 ip4:72.21.193.0/24 ip4:72.21.196.0/22
     ip4:72.21.208.0/24 ip4:72.21.205.0/24 ip4:72.21.209.0/24 ip4:194.154.193.200/28 ip4:194.7.41.
152/28
     ip4:212.123.28.40/32 ip4:203.81.17.0/24 ~all"],
   @ttl=2237>]
 => nil
```

I'm also attaching a patch for 1.8.7 in the hope that it will be merged into 1.8.7, too.

Of course it would be nice to also support EDNS0, but that's beyond what I can deliver right now.
=end

History

#1 - 09/19/2010 05:51 AM - julian.mehnle (Julian Mehnle)

- File resolv-1.9.2-tcp-fallback2.diff added

- File resolv-1.8.7-tcp-fallback2.diff added

=begin
I've discovered a bug in my patch: Resolv::DNS::Message#tc returns a numerical value (0 or 1), not a boolean. Also, let's play it safe and #close the UDP requester before replacing it with the TCP requester.

I've successfully tested these revised patches in a heavy-load production environment that does hundreds of thousands of DNS lookups every day.
=end

#2 - 10/30/2010 06:07 AM - akr (Akira Tanaka)

- Status changed from Open to Closed

- % Done changed from 0 to 100

=begin
This issue was solved with changeset r29631.
Julian, thank you for reporting this issue.
Your contribution to Ruby is greatly appreciated.
May Ruby be with you.

=end

#3 - 10/30/2010 08:28 PM - julian.mehnle (Julian Mehnle)

=begin
Oh, thanks for reminding me! I recently discovered another issue with my patch. It fails if the system has more than one resolver configured in /etc/resolv.conf:

$ cat /etc/resolv.conf

192.168.0.123 does not exist, 127.0.0.1 does:

nameserver 192.168.0.123
nameserver 127.0.0.1
search mehnle.net

$ irb

```
require 'resolv'
=> true
require 'patch/resolv'
=> true
dns = Resolv::DNS.new
```

```
=> #<Resolv::DNS:0x7fa2e9fe01a8 @config=#<Resolv::DNS::Config:0x7fa2e9fe0130 @initialized=nil, @config_info=nil, @mutex=#
Mutex:0x7fa2e9fe00b8>, @initialized=nil, @mutex=#Mutex:0x7fa2e9fe0158>
dns.getresources('amazon.com', Resolv::DNS::Resource::IN::TXT)
Errno::EHOSTUNREACH: No route to host - connect(2)
from /usr/lib/ruby/1.8/resolv.rb:762:in initialize'          from /usr/lib/ruby/1.8/resolv.rb:762:in new'
from /usr/lib/ruby/1.8/resolv.rb:762:in initialize'          from patch/resolv.rb:61:in new'
from patch/resolv.rb:61:in make_tcp_requester'          from patch/resolv.rb:29:in each_resource'
from patch/resolv.rb:131:in resolv'          from patch/resolv.rb:129:in each'
from patch/resolv.rb:129:in resolv'          from patch/resolv.rb:128:in each'
from patch/resolv.rb:128:in resolv'          from patch/resolv.rb:126:in each'
from patch/resolv.rb:126:in resolv'          from patch/resolv.rb:15:in each_resource'
from /usr/lib/ruby/1.8/resolv.rb:468:in `getresources'
from (irb):2
```

We worked around this by reducing our resolv.conf files to a single nameserver, but obviously this is not a generally acceptable solution.

I'll try to come up with a fix today.

=end

Files

resolv-1.9.2-tcp-fallback.diff	1.84 KB	09/16/2010	julian.mehnle (Julian Mehnle)
resolv-1.8.7-tcp-fallback.diff	1.83 KB	09/16/2010	julian.mehnle (Julian Mehnle)
resolv-1.9.2-tcp-fallback2.diff	1.87 KB	09/19/2010	julian.mehnle (Julian Mehnle)
resolv-1.8.7-tcp-fallback2.diff	1.87 KB	09/19/2010	julian.mehnle (Julian Mehnle)