

pfSense - Bug #3670

IPv6 DHCP-PD over PPPoE non functional + radvd core dump + solution

05/20/2014 10:31 AM - Nic Hannekum

Status:	Resolved	Start date:	05/20/2014
Priority:	Normal	Due date:	
Assignee:	Chris Buechler	% Done:	0%
Category:	DHCP6	Estimated time:	0.00 hour
Target version:	2.2.5		
Affected Version:	All	Affected Architecture:	All

Description

So i've been working through this for a couple of evenings now and have a working, reliable configuration requiring a number of patches.

Version pfSense 2.1.3-RELEASE.

My ISP (Internode) offers the following IPv6 configuration:

Here's what you get when your connection is set up for IPv6:

Your existing IPv4 address (if static) and any existing framed route(s).

A dual-stack IPv4/IPv6 PPP session.

A dynamic /64 IPv6 prefix for your PPP session.

A static /56 IPv6 prefix for your LAN (if you are using a router with Prefix Delegation).

pfSense Configuration:

-- WAN --

IPv4 Configuration Type: PPPoE

IPv6 Configuration Type: DHCP6

Use IPv4 connectivity as parent interface: Yes

Request only a IPv6 prefix: No

DHCPv6 Prefix Delegation size: 56

Send IPv6 prefix hint: No

-- LAN --

IPv4 Configuration Type: Static IPv4

IPv6 Configuration Type: Track Interface

Track...IPv6 Interface: WAN

Problem 1: Incorrect identification of WAN IPv6 interface

The `get_interface_ipv6` function in `/etc/inc/interfaces.php` incorrectly identifies the WAN interface as the physical hardware interface (`re0` in my case) rather than the `pppoe0` interface.

As a result, no global IPv6 address can be found (empty `$ifcfgipv6`) while an incorrect `/var/etc/radvd.conf` file is generated (among other things like the global WAN IPv6 address not being displayed in the GUI even though `ifconfig pppoe0` shows one - see this bug <https://redmine.pfsense.org/issues/3556>).

Solution 1: `$realif` should equal `pppoe0` rather than `re0`

```
[2.1.3-RELEASE][root@pfsense]/etc/inc: diff interfaces.inc.pfsense interfaces.inc
4526c4526
<         $realif = get_real_interface($interface, "inet6", true);
---
>         $realif = get_real_interface($interface, "inet6", false);
```

You should now see a global IPv6 address under the WAN interface in GUI Dashboard.

Note: the above patch **might** be incorrect for other configurations.

Problem 2: dhcp6c configuration

Including (empty?) stateful (*ia-na*) DHCP6 configuration interferes with PD (*ia-pd*) and **may** be the cause of multiple dhcp6c processes (or could be related to this?):

<https://redmine.pfsense.org/projects/pfsense/repository/revisions/9b6010ffc526f4106bc423c8cd8fff12b9ad4cee>

Solution 2: Remove stateful configuration (for now)

```
[2.1.3-RELEASE][root@pfsense]/etc/inc: diff interfaces.inc.pfsense interfaces.inc
3501,3502d3500
<         if(!isset($wancfg['dhcp6prefixonly']))
<             $dhcp6cconf .= "                send ia-na 0;    # request stateful address\n";
3512,3514d3509
<         if(!isset($wancfg['dhcp6prefixonly']))
<             $dhcp6cconf .= "id-assoc na 0 { }; \n";
```

Problem 3: radvd configuration

Definitely one, potentially two configuration parameters cause PD to fail; *AdvOtherConfigFlag on* prevents auto-configuration of non-address information (DNS, default route?) while *AdvRouterAddr on* sends interface address instead of network prefix.

Solution 3: Remove these bad boys for a PD config

```
[2.1.3-RELEASE][root@pfsense]/etc/inc: diff services.inc.pfsense services.inc
253d252
<     $radvdconf .= "\tAdvOtherConfigFlag on;\n";
257d255
<     $radvdconf .= "\t\tAdvRouterAddr on;\n";
```

After applying the above i've had a solid IPv6 connection that survives "pfSense package system has detected an ip change" and reliably delegates my IPv6 prefix to LAN.

History

#1 - 05/20/2014 10:50 AM - Nic Hannekum

Further note:

During the course of debugging this issue I also came across bug <https://redmine.pfsense.org/issues/3286> and the above fixes this.

#2 - 05/20/2014 07:53 PM - Phillip Davis

@Nicolas - in addition to reporting the bug/s here, you can make edits and submit your own pull requests online at <https://github.com/pfsense/pfsense> - that makes it very easy for the devs to review and commit the fixes you have found.

#3 - 05/21/2014 04:34 PM - Nic Hannekum

No worries Phillip - will do. Just setting up a proper dev environment. Any recommendations? I'm on a Mac and would ideally like to run git on pfsense box with text editor on mac directly editing pfsense files (over NFS i guess).

#4 - 05/21/2014 07:15 PM - Phillip Davis

I only do simple things that do not effect many files at once, so I haven't bothered with a whole development environment. For simple bugfixes, I work on the test system itself, use Diagnostics->Edit, copy/paste to back and firth to Notepad, when I get it right I copy/paste into the GitHub online editor and do a pull request.

If you are going to do more involved stuff, then I suggest you ask in the development section of the forum for ideas about the "best" development setup.

#5 - 05/22/2014 02:02 AM - Ermal Luçi

You are sure that you have not selected the wrong options in the interface configuration page on the GUI for this?

#6 - 05/22/2014 06:48 AM - Nic Hannekum

Ermal Luçi wrote:

You are sure that you have not selected the wrong options in the interface configuration page on the GUI for this?

Which wrong options are you referring to?

It quickly became obvious that something was not right when the WAN interface did not display the global IPv6 address (via GUI) while an `ifconfig pppoe0` did. This is what the first patch fixes - rather than look for the global IPv6 on the physical hardware interface (in my case `re0`) which does not have one, look for it on the `pppoe0` interface.

Without the second patch, the dhcp6c client continually requests stateful configuration which is not offered by my ISP and quickly fills `system.log` with `'dhcp6c[xxxx]: update_ia: status code for NA-0: no addresses'`.

The third patch does as originally explained.

I should also mention that the GUI option `'Only request a IPv6 prefix, do not request a IPv6 address'` does not work, which I believe requires a dhcp6c configuration that uses the `'information-only'` directive which currently doesn't exist (with obviously no `ia-pd`, `ia-na` statements or configuration). The dhcp6c client would then NOT configure the `pppoe0` interface with a global IPv6 but `'information-only'` will still advise what delegated prefix to use in `radvd.conf` for any interfaces tracking `WAN`.

#7 - 05/26/2014 06:19 PM - Josh Cavalier

I have access to an Internode connection and can confirm Nic's findings.

The system is 2.1.3-RELEASE and I have applied changes for problems 1, 2 and 3 and can confirm that IPv6 now works.

I could never get IPv6 to work properly previously.

The ISP now allocates a /64 to pppoe0, and with 'track changes' on LAN side interfaces, they obtain an /56 from the prefix allocated by Internode.

With some correct IPv6 rules in place everything works a treat.

I'm happy to help out and do any testing if anyone needs.

#8 - 11/30/2014 01:15 AM - Furen Xiao

I can confirm that at least the first problem also exists in 2.2-BETA.

In shell, ifconfig gives me:

```
pppoe0: flags=88d1<UP,POINTOPOINT,RUNNING,NOARP,SIMPLEX,MULTICAST> metric 0 mtu 1492
  inet6 fe80::a236:9fff:feal:438%pppoe0 prefixlen 64 scopeid 0xb
  inet6 2001:b010:1080:4800:a236:9fff:feal:438 prefixlen 64 autoconf
  inet 1.162.95.24 --> 168.95.98.254 netmask 0xffffffff
```

```
nd6 options=23<PERFORMNUD,ACCEPT_RTADV,AUTO_LINKLOCAL>
```

But in webUI, I got only IPv4 address.

#9 - 12/02/2014 06:08 AM - Dmitriy K

I believe this bug should be targeted against 2.2

#10 - 12/02/2014 08:01 AM - Ermal Luçi

- *Affected Documentation 0 added*

Can you confirm that dhcpv6 is running on top of pppoe?

#11 - 09/08/2015 01:03 AM - Jörg Schneider

I have a IPv6 configuration like the one described by Nic, but with a different ISP (Deutsche Telekom). My systems runs 2.1.5-RELEASE.

I didn't run into problems 2 and 3, but "Problem 1: Incorrect identification of WAN IPv6 interface" affects me as well.

I also noticed the missing display of the IPv6 address in the GUI on the WAN interface.

More seriously I found that /etc/rc.newwanipv6 bails out with the following error:

```
rc.newwanipv6: Failed to update WAN[wan] IPv6, restarting...
```

This is, because "\$curwanipv6 = get_interface_ipv6(\$interface, true);" returns no IPv6 address.
This has the affect (among others) that no default route is set for IPv6.

"Solution 1" above solves the issues and gives a working IPv6 configuration.

#12 - 09/08/2015 01:09 AM - Jörg Schneider

Ermal Luçi wrote:

Can you confirm that dhcpv6 is running on top of pppoe?

In my setup (see the update 11]) I can confirm that dhcpv6 runs on top of pppoe.

#13 - 09/08/2015 02:19 AM - Kill Bill

Got tired of this nonsense.

<https://github.com/pfsense/pfsense/pull/1886/> - master

<https://github.com/pfsense/pfsense/pull/1887/> - RELENG_2_2

Broken initial commit (never changed since then): <https://github.com/pfsense/pfsense/commit/420aa48b98d94e33336f72cd2f5abc8760431089>

#14 - 09/16/2015 02:39 AM - Chris Buechler

- Status changed from *New* to *Feedback*

- Target version set to 2.2.5

merged, thanks! Leaving for feedback

#15 - 10/03/2015 12:43 AM - Chris Buechler

- Status changed from *Feedback* to *Resolved*

- Affected Version changed from 2.1-IPv6 to All

Thanks doktornotor. fixed

#16 - 12/06/2015 03:19 PM - Jim Thompson

- Assignee set to *Chris Buechler*

even though Resolved, the lack of assignee drives my OCD over the edge.