

## pfSense - DHCP6c and Unbound DNS Server Boot-Up Configuration Failure

**Summary:** When running my router with 'Track Interface' and dual IPv4/IPv6, using unbound as a local DNS server bound to only internal interfaces LAN, LAN IPv6, and LAN IPv6 Link-Local, the DHCP6c service start-up is clobbering the FreeBSD kernels' IPv6 auto link local LAN (`net.inet6.ip6.auto_linklocal=1`) assignment over to a default address of `fe80::1:1` and causing unbound DNS server to fail to startup for local service which still hold the original address in `unbound.conf`, and which it cannot 'bind' socket to, crashing on startup.

**Details:** *In the following example, the pfSense firewall/router running in 'Track Interface' mode dual IPv4/6, and with unbound as a local DNS server, and has the following configurations issued by the telco provider, e.g. we have both IPv4 /32 single IPADDR, and a /64 block issued:*

```
WAN IPv4: 71.56.201.64
WAN IPv6: 2001:558:6040:3b:351e:1f6f:42b1:4118
WAN IPv6 link-local: fe80::ae1f:6bff:fe10:cb08%igb0
WAN Interface: igb0
```

The WAN addresses above are dynamically assigned in this case, with the exception of the WAN IPv6 link-local.

```
LAN IPv4: 192.168.16.1
LAN IPv6: 2601:285:0:4ddc:ae1f:6bff:fe10:cb09
LAN IPv6 link-local (ORIG ON BOOT): fe80::ae1f:6bff:fe10:cb09%igb1
LAN IPv6 link-local (AFTER DHCP6c): fe80::1:1%igb1
LAN Interface: igb1
```

The IPv6 link-local LAN address (`fe80::ae1f:6bff:fe10:cb09%igb1`) at FreeBSD boot time is initially assigned, and it comes from the and is derived from the `igb1` device MAC ADDR, since the FreeBSD kernel `sysctl` settings have:

```
net.inet6.ip6.auto_linklocal: 1
```

The router on boot, uses these link-local addresses to create the initial `unbound.conf` DNS resolver configuration. after WAN DHCP/DHCPv6 configuration, using these default ethernet parameters including default link-local IPv6 LAN address as follows:

```

# /var/unbound/unbound.conf
# Interface IP(s) to bind to
interface: 192.168.16.1 (LAN IPv4)
interface: 2601:285:0:4ddc:aelf:6bff:fe10:cb09 (LAN IPv6)
interface: fe80::aelf:6bff:fe10:cb09%igb1 (LAN IPv6 link-local)
interface: 127.0.0.1 (LAN IPv4 loopback)
interface: ::1 (LAN IPv6 loopback)

```

When running in 'Track Interface' mode, the firewall/router dynamically obtains the WAN IPv6 /32 IP address, and a dynamically provider assigned /64 network block for the IPv6 LAN.

*The DHCP6c daemon then starts up, and during this process, as part of configuring the IPv4 LAN and the IPv6 LAN link-local address, the latter is changed to a new default: fe80::1:1%igb1 -- which is NOT the MAC ADDR associated auto link-local address used at boot.*

Next the unbound DNS server attempts to start up, and listen on all the 3 LAN interfaces (LAN, LAN IPv6 Link-Local, Localhost), and the following error:

```

Jun 5 13:46:58      dhcpleases  96459 Could not deliver signal HUP to process
because its pidfile (/var/run/unbound.pid) does not exist, No such file or
directory.
Jun 5 13:46:58      kernel      done.
Jun 5 13:46:58      php        800      rc.bootup: sync unbound done.
JUn 5 13:46:58      php        800      rc.bootup: The command '/usr/local/sbin/unbound
-c /var/unbound/unbound.conf' returned exit code '1', the output was
      '[1559764018] unbound[95747:0] debug: creating udp4 socket 192.168.16.1
53
      [1559764018] unbound[95747:0] debug: creating tcp4 socket 192.168.16.1 53
      [1559764018] unbound[95747:0] debug: creating udp6 socket
2601:285:0:4ddc:aelf:6bff:fe10:cb09 53
      [1559764018] unbound[95747:0] debug: creating tcp6 socket
2601:285:0:4ddc:aelf:6bff:fe10:cb09 53
      [1559764018] unbound[95747:0] debug: creating udp6 socket
fe80::aelf:6bff:fe10:cb09 53
      [1559764018] unbound[95747:0] error: can't bind socket: Can't assign
requested address for fe80::aelf:6bff:fe10:cb09 port 53 (len 28)
      [1559764018] unbound[95747:0] fatal error: could not open ports'

```

However, this fails, as the IPv6 link-local address was changed from its auto assignment of: fe80::aelf:6bff:fe10:cb09%igb1 to fe80::1:1%igb1.

After the system is fully booted, if unbound DNS service is manually restarted, the /var/unbound/unbound.conf file is rebuilt properly by the startup scripts as:

```
# /var/unbound/unbound.conf
# Interface IP(s) to bind to
interface: 192.168.16.1 (LAN IPv4)
interface: 2601:285:0:4ddc:aelf:6bff:fe10:cb09 (LAN IPv6)
interface: fe80::1:1%igb (LAN IPv6 link-local)
interface: 127.0.0.1 (LAN IPv4 loopback)
interface: ::1 (LAN IPv6 loopback)
```

And the DNS service starts working on the LAN(s) after a manual restart!  
The full errors on boot are included as an image.

Jun 5 16:33:43	kernel		done.
Jun 5 16:33:42	kernel		done.
Jun 5 16:33:42	dhcpleases	99350	Could not deliver signal HUP to process because its pidfile (/var/run/unbound.pid) does not exist, No such file or directory.
Jun 5 16:33:42	kernel		done.
Jun 5 16:33:42	php	364	rc.bootup: sync unbound done.
Jun 5 16:33:42	php	364	rc.bootup: The command '/usr/local/sbin/unbound -c /var/unbound/unbound.conf' returned exit code '1', the output was '[1559774022] unbound[98340:0] debug: creating udp4 socket 192.168.16.1 53 [1559774022] unbound[98340:0] debug: creating tcp4 socket 192.168.16.1 53 [1559774022] unbound[98340:0] debug: creating udp6 socket 2601:285:0:4ddc:ae1f:6bff:fe10:cb09 53 [1559774022] unbound[98340:0] debug: creating tcp6 socket 2601:285:0:4ddc:ae1f:6bff:fe10:cb09 53 [1559774022] unbound[98340:0] debug: creating udp6 socket fe80::ae1f:6bff:fe10:cb09 53 [1559774022] unbound[98340:0] error: can't bind socket: Can't assign requested address for fe80::ae1f:6bff:fe10:cb09 port 53 (len 28) [1559774022] unbound[98340:0] fatal error: could not open ports'
Jun 5 16:33:41	php	364	rc.bootup: dhcp6 init complete. Continuing
Jun 5 16:33:41	kernel		done.
Jun 5 16:33:41	kernel		done.
Jun 5 16:33:41	kernel		done.
Jun 5 16:33:41	php	364	rc.bootup: Removing static route for monitor fe80::201:5cff:fe65:5846 and adding a new route through fe80::201:5cff:fe65:5846%igb0
Jun 5 16:33:40	php-fpm	328	/rc.newwanip6: Default gateway setting Interface WAN_DHCP Gateway as default.
Jun 5 16:33:40	kernel		....
Jun 5 16:33:40	php	364	rc.bootup: dpinger: status socket /var/run/dpinger_WAN_DHCP~71.56.201.64~71.56.200.1.sock not found
Jun 5 16:33:39	php	364	rc.bootup: dpinger: status socket /var/run/dpinger_WAN_DHCP~fe80::ae1f:6bff:fe10:cb08%igb0~fe80::201:5cff:fe65:5846%igb0.sock not found
Jun 5 16:33:39	kernel		pflag0: promiscuous mode enabled
Jun 5 16:33:39	php-fpm	328	/rc.newwanip6: Removing static route for monitor fe80::201:5cff:fe65:5846 and adding a new route through fe80::201:5cff:fe65:5846%igb0
Jun 5 16:33:39	php-fpm	329	/rc.newwanip: Removing static route for monitor fe80::201:5cff:fe65:5846 and adding a new route through fe80::201:5cff:fe65:5846%igb0
Jun 5 16:33:39	php-fpm	329	/rc.newwanip: The command '/sbin/route delete -host 2606:4700:4700::1111' returned exit code '68', the output was 'route: bad address: 2606:4700:4700::1111'
Jun 5 16:33:34	kernel		igb1: link state changed to UP
Jun 5 16:33:34	check_reload_status	342	Linkup starting \$igb1
Jun 5 16:33:33	php-fpm	328	/rc.newwanip6: rc.newwanip6: on (IP address: 2001:558:6040:3b:351e:1f6f:42b1:4118) (interface: wan) (real interface: igb0).
Jun 5 16:33:33	php-fpm	328	/rc.newwanip6: rc.newwanip6: Info: starting on igb0.
Jun 5 16:33:31	rtsold	18887	Starting dhcp6 client for interface wan(igb0)
Jun 5 16:33:31	rtsold	17962	Received RA specifying route fe80::201:5cff:fe65:5846 for interface wan(igb0)
Jun 5 16:33:30	kernel		done.
Jun 5 16:33:30	php	364	rc.bootup: Resyncing OpenVPN instances.
Jun 5 16:33:29	php-fpm	329	/rc.newwanip: rc.newwanip: on (IP address: 71.56.201.64) (interface: WAN[wan]) (real interface: igb0).
Jun 5 16:33:29	php-fpm	329	/rc.newwanip: rc.newwanip: Info: starting on igb0.
Jun 5 16:33:28	php	364	rc.bootup: Starting rtsold process
Jun 5 16:33:28	php	364	rc.bootup: Accept router advertisements on interface igb0
Jun 5 16:33:28	php	364	rc.bootup: calling interface_dhcpv6_configure.
Jun 5 16:33:28	check_reload_status	342	rc.newwanip starting igb0
Jun 5 16:33:28	kernel		igb0: link state changed to UP
Jun 5 16:33:28	check_reload_status	342	Linkup starting \$igb0
Jun 5 16:33:24	syslogd		Logging subprocess 6617 (exec /usr/local/sbin/sshd) exited due to signal 15.
Jun 5 16:33:24	sshd	6334	Server listening on 0.0.0.0 port 22.
Jun 5 16:33:24	sshd	6334	Server listening on :: port 22.
Jun 5 16:33:23	kernel		lo0: link state changed to UP
Jun 5 16:33:23	kernel		TSC: P-state invariant, performance statistics
Jun 5 16:33:23	kernel		VT-x: PAT,HLT,MTF,PAUSE,EPT,UG,VPID
Jun 5 16:33:23	kernel		Structured Extended Features3=0xc000400<IBPB,STIBP>
Jun 5 16:33:23	kernel		Structured Extended Features=0x2282<TSCADJ,SMEPERMS,NFPUSG>
Jun 5 16:33:23	kernel		AMD Features2=0x101<LAHF,Prefetch>
Jun 5 16:33:23	kernel		AMD Features=0x28100800<SYSCALL,NX,RDTSCPLM>
Jun 5 16:33:23	kernel		Features2=0x43d8e3bf<SSE3,PCLMULQDQ,DTES64,MON,DS_CPL,VMX,EST,TM2,SSSE3,CX16,xTPR,PDCM,SSE4.1,SSE4.2,MOVBE,POPCNT,TSCDLT,AESNI,RDRAND>
Jun 5 16:33:23	kernel		Features=0xbfebfbff<FPU,VME,DE,PSE,TSC,MSR,PAE,MCE,CX8,APIC,SEPMTTR,PGE,MCA,CMOV,PAT,PSE36,CLFLUSH,DTS,ACPI,MMX,FXSR,SSE,SSE2,SS,HTT,TM,PBE>
Jun 5 16:33:23	kernel		Origin="GenuineIntel" Id=0x406c3 Family=0x6 Model=0x4c Stepping=3
Jun 5 16:33:23	kernel		CPU: Intel(R) Pentium(R) CPU N3700 @ 1.60GHz (1600 04-MHz KR-class CPU)