CONNECT TO

PORT 53

DNS HACKATHON 2023

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DNSSEC Bootstrapping

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DNS Today + DNS Home Appliance

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DNS and the application layer - aka DApper

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DIG-alicious

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DNS Out of protocol signaling - aka DNS Oops

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0 DAYS SINCE IT WAS BGP

(Whoa, it wasn't DNS?)

DNS OOPS

Notify the BGP daemons

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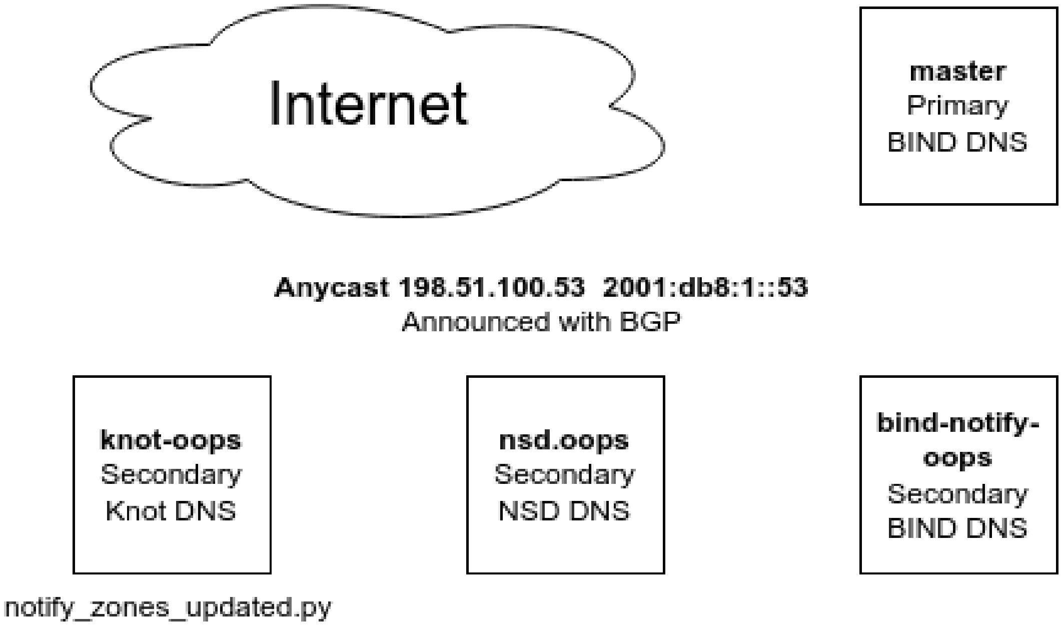
Goals for the project

This document seeks to specify **a method for name servers** to **signal programs outside** of the **name server software**, and which are not necessarily involved with the DNS protocol, **about conditions** that can arise **within the name server**. These **signals** can be used to **invoke actions** in areas that **help provide the DNS service**, such as **routing**.

Main URL:
https://datatracker.ietf.org/doc/draft-grubto-dnsop-dns-out-of-protocol-signalling/

The goal



Internet

master
Primary
BIND DNS

Anycast 198.51.100.53 2001:db8:1::53
Announced with BGP

knot-oops
Secondary
Knot DNS

notify_zones_updated.py

nsd.oops
Secondary
NSD DNS

bind-notify-oops
Secondary
BIND DNS

Automated signalling when things happen in the DNS server ...

Technologies used

- DNS server software: Knot DNS, BIND, NSD
- BGP software: Bird, ExaBGP
- Programming languages: Python 3, Shell scripting
- Notification: shell scripting, D-bus to Knot DNS

Example: Use the Libraries

First Python script uses various features:

```
#!/usr/bin/env python3

import sys
import dbus    // D-bus is implemented in Knot DNS
import dbus.mainloop.glib
import signal
import requests
import json
import libknot.control
from gi.repository import GLib

api_url = None
node_data_file = '/root/node_data.json'
zones = {}
```

Example: Event loop and D-bus

When zone is updated, do something:

```
def updated(*args, **kwargs):
    """
    Event handler for Glib.MainLoop
    Also explicitly called at script startup to determine if any event handling needs to be done
    """
    (zone, serial) = args
    print("Zone %s updated, SOA serial %d" % (zone, serial))
    zones[zone] = serial
    if None not in zones.values():
        # Build a list of all zones with serials
        all_zone_info = ""
        for key in zones:
            all_zone_info += f'{key}:{zones[key]};'
...
```

This is an example, can be run inside/outside of the server, in cloud systems etc.

Improvements and next steps

- Draft being updated https://datatracker.ietf.org/doc/draft-grubto-dnsop-dns-out-of-protocol-signalling/
- Create dockerfiles for packing this in an easy way
- Add some bridging between Notify and D-bus
- Add D-bus features to NSD
- NSD issue and branch being created https://github.com/NLnetLabs/nsd/pull/280