

# DNS Out of Protocol Signalling



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# DNS Out Of Protocol Signalling

## On anycast nodes

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1. Don't announce prefix yet
2. Load zones  
*when all zones are loaded:*
3. Announce prefix

## and similarly...

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1. *when a zone or signatures are about to expire*
2. Withdraw prefix



## Motivation

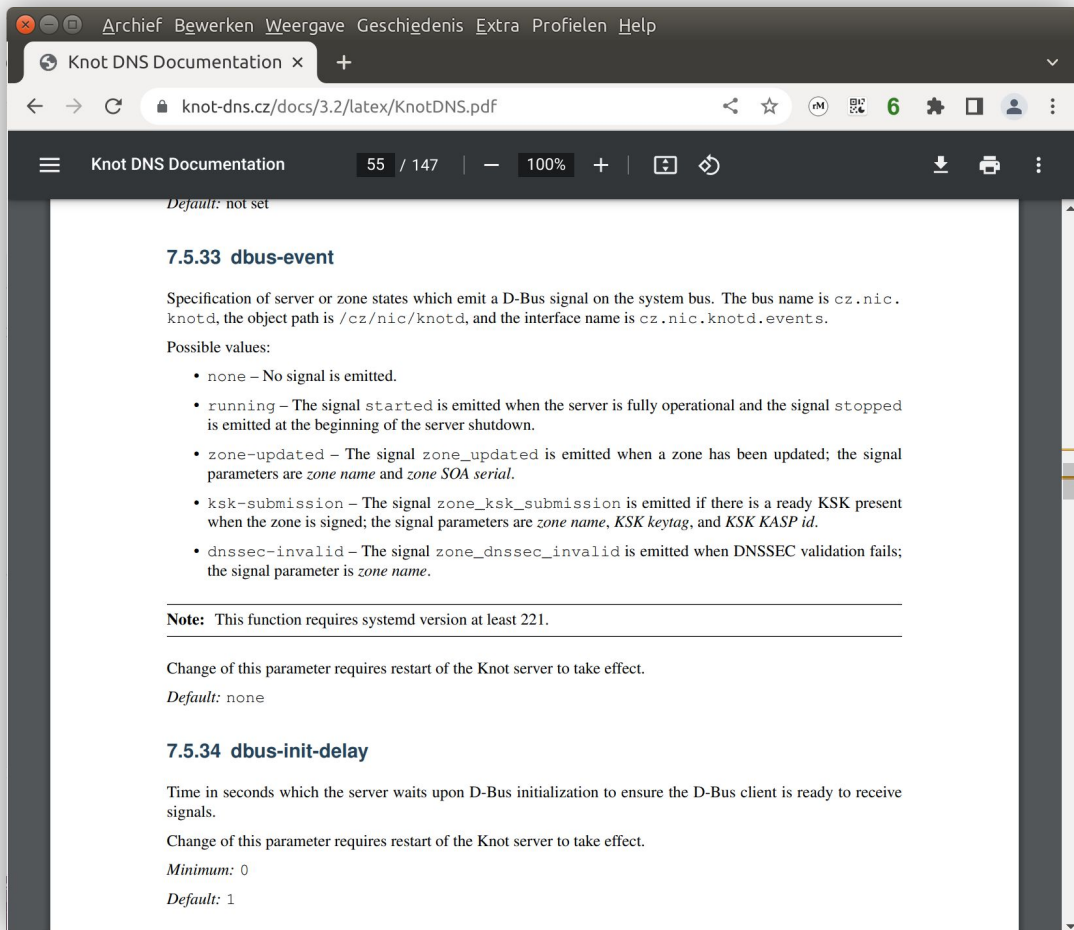
- Feature in Knot DNS
- Uses D-Bus
  - Publish/subscribe
  - Specified under freedesktop.org<sup>1</sup>



[One-click deploy](#)

- Knot-DNS only

1. freedesktop.org is a "collaboration zone" for standards and specifications, and not a formal standards organization.



# D-Bus

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- Local to the system
- + Plenty of tools
- Startup order matters

## Requirements

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- What other conditions are interesting to signal?
- How to identify? What associated action could they have?
- What signalling mechanism suit those best?

```
import dbus, dbus.mainloop.glib
from gi.repository import GLib

def sig_started(*args, **kwargs):
    print("Server started")

def sig_updated(*args, **kwargs):
    (zone, serial) = args
    print("Updated zone=%s to serial=%d" % (zone, serial))

knotd = dbus.SystemBus().get_object('cz.nic.knotd', '/cz/nic/knotd',
    follow_name_owner_changes=True, introspect=False)

events_if = dbus.Interface(knotd, dbus_interface='cz.nic.knotd.events')
events_if.connect_to_signal("started", sig_started)
events_if.connect_to_signal("zone_updated", sig_updated)

dbus.mainloop.glib.DBusGMainLoop(set_as_default=True)
GLib.MainLoop().run()
```

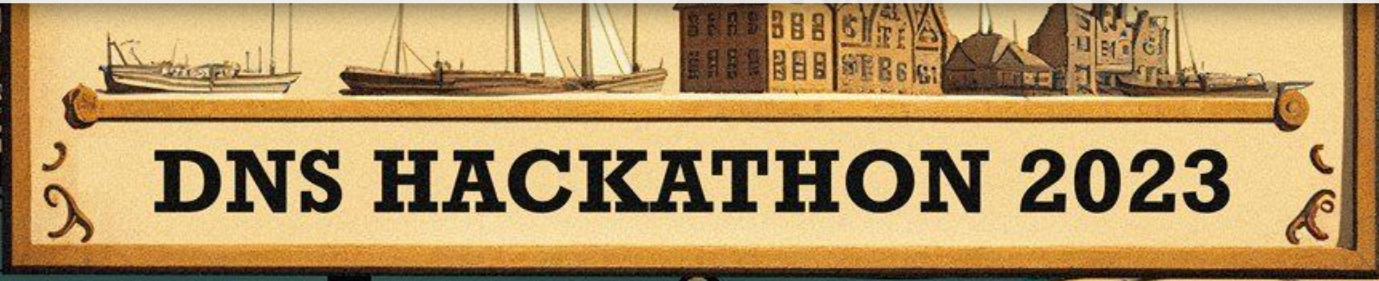
<i>Condition</i>	<i>Resolv.</i>	<i>Param.</i>	<i>Arg.</i>	<i>Detection</i>
3.1 Server is running and can respond to queries	✓			query
3.2 Shutting down	✓			within only
3.3 The nameserver has crashed	✓			outside only
3.4 A zone is loaded and ready to serve			zone	query
3.5 All zones are loaded and ready to serve				within only
3.6 A zone is updated to a new version			zone	query / notify
3.7 A zone is (about to) expire		period	zone	within only
3.8 DNSSEC signatures are about to expire		period	RRset	within only
3.9 Query rate is exceeding a threshold	✓	qps		within
3.10 Query rate increase is exceeding a threshold	✓	qpsps		within
3.11 Extended DNS Error conditions	✓	EDEs	EDE	within



[DNS OOPS](#) - Doris Hauser, Henrik Kramselund, Lars-Johan Liman, Stefan Ubbink, Vilhelm Prytz, Willem Toorop

- Start announcing prefix when zone is loaded / updated

Implementation	Signal mechanism	Receiver	BGP speaker
Knot-DNS	D-Bus	Python script	BIRD
BIND	NOTIFY	nsnotifyd	exabgp
NSD	Zone-verification hook		BIRD



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# Signalling mechanisms

	Poll	NOTIFY	D-Bus	DOTS	MQTT	Kafka
Already there	++	++	+	-	-	-
# conditions	-	--	+	+	+	+
Local to machine	++	+	++	+	+	?
Inter machine	+	+	-	+	+	?
Inter operator	+	+	-	++	-	?
Authentication	--	+	-	++	+	?
Publish / subscribe	--	-	-	++	++	?
Client library availability	NA	NA	++	?	++	++

# DNS Out Of Protocol Signalling

- Clear operator interest
- Knot-DNS has something implemented already
- We need to align implementations (standardize)
- Still in the inventorization of requirements and evaluation of signalling mechanisms stage
- Workgroup interest? And if so, when?

