

# IETF 101 DNS Hackathon

Minimal IXFR (MIXFR)



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# IETF 101 DNS Hackathon: MIXFR

**draft-mekking-mixfr-01**

***This document proposes extensions to the DNS protocol to provide an incremental zone transfer (IXFR) mechanism to keep IXFRs (that deal with DNSSEC) small.***



# IETF 101 DNS Hackathon: MIXFR

## Hacking Implicit RRSIG Deletion into Knot DNS

```
▼ src/knot/Makefile.inc
```

...	...	@@ -86,6 +86,8 @@ libknotd_la_SOURCES = \	
86	86	knot/nameserver/ixfr.c	✓
87	87	knot/nameserver/ixfr.h	✓
88	88	knot/nameserver/log.h	✓
	89	+ knot/nameserver/mixfr.c	✓
	90	+ knot/nameserver/mixfr.h	✓
89	91	knot/nameserver/notify.c	✓
90	92	knot/nameserver/notify.h	✓
91	93	knot/nameserver/nsec_proofs.c	✓
...	...		

# IETF 101 DNS Hackathon: Results

**Commits (33)**

**9 changed files...**

**...with 695 additions and 50 deletions**

**2 issues**



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# IETF 101 DNS Hackathon: Results

## MIXFR: 1217 bytes (saved 888 bytes)

Domain Name System (response)

[\[Request In: 18\]](#)

[Time: 0.000713631 seconds]

Length: 1215

Transaction ID: 0x3bee

▶ Flags: 0x8000 Standard query response, No error

Questions: 1

Answer RRs: 9

Authority RRs: 0

Additional RRs: 1

▶ Queries

▼ Answers

▶ mixfr.nl: type SOA, class IN, mname dns-master.mixfr.nl

▶ mixfr.nl: type SOA, class IN, mname dns-master.mixfr.nl

▶ mixfr.nl: type SOA, class IN, mname dns-master.mixfr.nl

▶ mixfr.nl: type MX, class IN, preference 999, mx smtp2.mixfr.nl

▶ mixfr.nl: type A, class IN, addr 46.19.37.145

▶ mixfr.nl: type RRSIG, class IN

▶ mixfr.nl: type RRSIG, class IN

▶ mixfr.nl: type RRSIG, class IN

▶ mixfr.nl: type SOA, class IN, mname dns-master.mixfr.nl

▶ Additional records

# IETF 101 DNS Hackathon: Results

## DNSSEC re-sign: 22390 bytes of IXFR

```
[2 Reassembled TCP Segments (22390 bytes): #171(21888), #173(502)]
```

```
Domain Name System (response)
```

```
[Request In: 169]
```

```
[Time: 0.002241768 seconds]
```

```
Length: 22388
```

```
Transaction ID: 0xd921
```

```
▶ Flags: 0x8000 Standard query response, No error
```

```
Questions: 1
```

```
Answer RRs: 78
```

```
Authority RRs: 0
```

```
Additional RRs: 0
```

```
▶ Queries
```

```
▼ Answers
```

```
▶ mixfr.nl: type SOA, class IN, mname dns-master.mixfr.nl
```

```
▶ mixfr.nl: type SOA, class IN, mname dns-master.mixfr.nl
```

```
▶ vps.mixfr.nl: type RRSIG, class IN
```

```
▶ vps.mixfr.nl: type RRSIG, class IN
```

```
▶ vps.mixfr.nl: type RRSIG, class IN
```

```
▶ vps.mixfr.nl: type RRSIG, class IN
```

```
▶ imap.mixfr.nl: type RRSIG, class IN
```

```
▶ imap.mixfr.nl: type RRSIG, class IN
```

```
▶ imap.mixfr.nl: type RRSIG, class IN
```

```
▶ dns-master.mixfr.nl: type RRSIG, class IN
```

```
▶ dns-master.mixfr.nl: type RRSIG, class IN
```

```
▶ smtp-secondary1.mixfr.nl: type RRSIG, class IN
```

```
▶ smtp-secondary1.mixfr.nl: type RRSIG, class IN
```

```
▶ smtp-secondary1.mixfr.nl: type RRSIG, class IN
```

```
▶ smtps.mixfr.nl: type RRSIG, class IN
```

```
▶ smtps.mixfr.nl: type RRSIG, class IN
```

```
▶ smtps.mixfr.nl: type RRSIG, class IN
```

```
▶ smtp-primary.mixfr.nl: type RRSIG, class IN
```

```
▶ smtp-primary.mixfr.nl: type RRSIG, class IN
```

```
▶ mixfr.nl: type RRSIG, class IN
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```
▶ mixfr.nl: type RRSIG, class IN
```

```
▶ dns-slave1.mixfr.nl: type RRSIG, class IN
```

```
▶ dns-slave1.mixfr.nl: type RRSIG, class IN
```

```
▶ dns-slave1.mixfr.nl: type RRSIG, class IN
```

```
▶ mail.mixfr.nl: type RRSIG, class IN
```

```
▶ mail.mixfr.nl: type RRSIG, class IN
```

```
▶ mail.mixfr.nl: type RRSIG, class IN
```

```
000 57 74 d9 21 80 00 00 01 00 4e 00 00 00 00 05 6d
```

```
010 69 78 66 72 02 6e 6c 00 00 fb 00 01 c0 0c 00 06
```

```
020 00 01 00 00 0e 10 00 33 0a 64 6e 73 2d 6d 61 73
```

```
030 74 65 72 c0 0c 05 6d 69 78 66 72 06 66 6f 6f 62
```

```
wt!....N.....m
```

```
ixfr.nl. ....
```

```
.....3 .dns-mas
```

```
ter...mi xfr fooh
```

# IETF 101 DNS Hackathon: Results

**RSASHA256: Saved ~300 bytes / RRSIG**

**ECDSAP256SHA256: Saved ~100 bytes / RRSIG**

**For each RRSIG per changed/re-signed RRset  
SOA RRset will always change**



# IETF 101 DNS Hackathon: Thoughts

## **Improving DNS replication:**

- \* Packet size**
- \* Disk space, disk I/O**
- \* Secondary server features signaling, for example online signing**
- \* (M)IXFR-ONLY**
- \* Separate protocol**

# IETF 101 DNS Hackathon: Thoughts

**Improving DNS replication, something we should work on?**

**Dealing with the Camel:**

**rm -rf RFC1995 (IXFR)**

**rm -rf RFC2931 (SIG(0))**



**Thanks for your support: Petr Špaček**

**Blog: TBD on RIPE LABS**

**Draft: <https://datatracker.ietf.org/doc/draft-mekking-mixfr/>**

**GitLab <https://gitlab.labs.nic.cz/matje/knot-dns/tree/mixfr>**