DNS Automation: Catalog Zones

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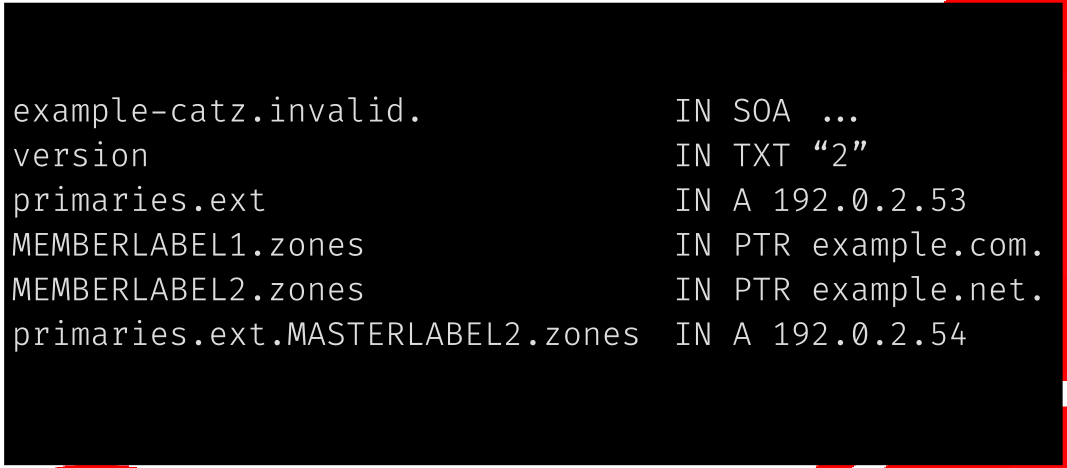
What's This All About?

- Adding and removing zones on secondaries has to be done out-of-band, which can be cumbersome
  - Especially if it's somebody else's server
- RFC9432 introduces a way to do this in-band
- Needs integration into existing processes and automation
- I'm offering secondaries on `ns.axu.fi` or `ns.trex.fi` as rewards :)

Basic Concepts

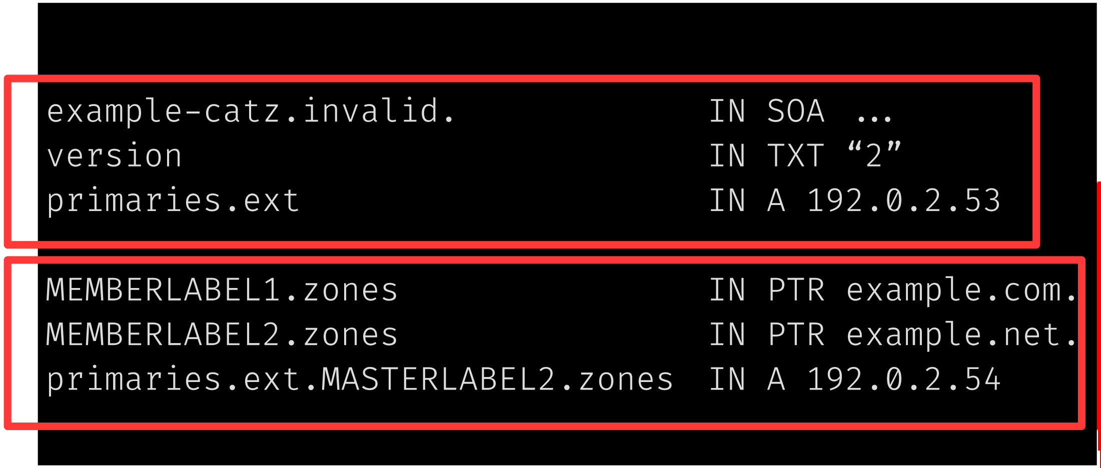
- Catalog Zone: lists zones and related configuration
- Member Zone: one of the zones listed in the Catalog
- Member Label: unique deterministic placeholder for per-zone configuration
- Consumer: DNS secondary
- Producer: DNS primary



```
example-catz.invalid.                IN SOA  ...
version                              IN TXT “2”
primaries.ext                        IN A 192.0.2.53
MEMBERLABEL1.zones                   IN PTR example.com.
MEMBERLABEL2.zones                   IN PTR example.net.
primaries.ext.MASTERLABEL2.zones     IN A 192.0.2.54
```

Generation: Two Parts

1. Static stuff at the apex
   - common for all zones
2. Member zone specific stuff



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Label Generation Example

```
#!/usr/bin/env python3
# printf “\7example\3com\0” | openssl sha1
import dns.name, hashlib, sys
print(hashlib.sha1(dns.name.from_text(sys.argv[1]).to_wire()).hexdigest() + \
        ".zones\tIN PTR\t" + sys.argv[1] + ".")
```

Security Considerations

- TSIG or TLS for transfers
- Member Zone collisions: first come first served
- Catalog Zone should be “inaccessible”
  - Empty `allow-query` and `allow-transfer` on the secondaries
    - Alright, maybe allow localhost and primary for debugging?
  - Under some non-global TLD such as `local.` or `invalid.`
  - Unique name to avoid collisions with other Catalog Zones

Thank you!

Questions?

Config Example: Bind9

- The catalog zone is configured as a normal secondary zone on the **Consumer**
- And then it is “blessed” as a catalog zone in the options
- Zones will be stored in zone-directory, to avoid file name collisions

```
zone "catalog.example.invalid" {
      type secondary;
      masters { 198.51.100.20; 2001:db8:2b15::35; };
      file "catalog.example.invalid.db";
      allow-transfer { localhost; };
      allow-query { localhost; };
};

options {
      catalog-zones {
             zone "catalog.example.invalid"
                    default-masters { 198.51.100.20; 2001:db8:2b15::35; }
                    zone-directory "/var/cache/bind/example"
                    in-memory no;
     };
};
```