Consistency for CDS/CDNSKEY (and CSYNC) is Mandatory

draft-thomassen-dnsop-cds-consistency

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Parent-Child Relationship: How Much Scrutiny is Needed?

- **Via CDS/CDNSKEY**, child tells parent which DS records to publish (RFC 7344)
  - Child publishes, parent consumes (discovery by polling)
  - Good for **DNSSEC-related delegation changes** (key rollovers, bootstrapping)

- **Similarly, CSYNC** signals which other data need update (RFC 7477)
  - Tells parent to fetch child-side records (e.g. NS or glue) and place it in the parent’s delegation
  - Good for **non-DNSSEC delegation changes** (hostnames/glue, provider change)

- **RFCs do not specify how the parent should be doing poll queries**
  - Parent may be tempted to ask just one authoritative server
  - **Does not ensure that records are compatible** across auth servers

- **What can possibly go wrong? 🤔**
Failure Scenarios: **Multi-homing**

- **DS breakage (multi-signer):**
  - Provider performs key rollover
  - Accidentally publishes only their own CDS/CDNSKEY record set
  - When used by parent, other providers' keys are removed from chain of trust
    → **broken**

- **NS breakage:**
  - Provider publishes *incomplete* NS record set (e.g. after changing their hostnames)
  - Then requests update via CSYNC
  - When used by parent, other providers are removed from NS record set
    → **broken**

... reduced to single-provider setup!
Failure Scenarios: **Provider Change**

- **Provider change for secure delegation requires brief multi-signer period**
  - Old provider imports new provider's DNSKEY/CDS/CDNSKEY (and vice versa)
  - Then update DS, then update NS

- **What if new provider fails to sync CDS/CDNSKEY?**
  - Both providers in NS, but new provider serves incomplete CDS/CDNSKEY (only their own)
  - When used by parent, old provider is removed from DS (but not yet from NS)
    → **broken**

❗ Single provider should not be in the position to remove others’ trust anchors❗
Better: **Ensure Consistency** before acting on C* Records

- **DNS resolution/validation breaks down** if a single provider makes a mistake
  - Undermines multi-homing guarantees (operator independence)
  - Can be solved if parent is careful!

- **Proposal:**
  - Query CDS/CDNSKEY/CSYNC (+ related records) from all authoritative servers
  - Disregard unresponsive servers
  - Require consistency across responses, otherwise abort (or retry)

Adopt [draft-thomassen-dnsop-cds-consistency](https://example.com)?