CDNI Request Routing: Footprint and Capabilities Semantics Draft (draft-spp-cdni-rr-foot-cap-semantics-01) and Progress report from the "Footprint and Capabilities Advertisement" Design Team

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Background

- Discussion at IETF-82/83 on Footprint and Capabilities Advertisement (as part of CDNI request routing)
  - Agreement at IETF-82 that we first need to work out **what** this interface is intended to do before we can decide on a suitable protocol solution (i.e. the **how**)
  - Several people volunteered to write a draft about the semantics of "Footprint and Capabilities Advertisement"
  - Design team on CDNI "Footprint and Capabilities Advertisement" formed at IETF-83
    - Several phone calls and mailing list discussions since then

Goals

- Goals of **draft-spp-cdni-rr-foot-cap-semantics**
  - Foster discussions by asking the right questions that are currently open
  - Capture the semantics of the "Footprint and Capabilities Advertisement" part of the CDNI Request Routing interface, i.e. the desired meaning and what "Footprint and Capabilities Advertisement" is expected to offer within CDNI
  - Capture discussions and outcome of design team
  - Eventually facilitate the choosing of one or more suitable protocols for "Footprint and Capabilities Advertisement" within CDNI Request Routing

- Changes since last version
  - Added more requirements from requirements draft that are relevant for the discussion of “footprint” and “capabilities”
  - Addressed several other comments from Francois on the mailing list
  - Adding latest discussions in design team
    - Avoiding or Handling 'cheating' Downstream CDNs
    - Focus on Main Use Cases
    - footprint can be defined as "willingness to serve“, but needs additional information

Design Decisions (1)

- some agreement -

- Avoiding or Handling 'cheating' Downstream CDNs
  - Probably sufficient that a uCDN can verify dCDN information at a later stage (and not during the request routing itself)
- Focus on Main Use Cases may Simplify Things
  - a main realistic use case is the existence of ISP-owned CDNs, but overlapping footprints are in scope
  - Reasonable to assume that uCDN that makes the decision on selecting a certain dCDN

Design Decisions (2)

- open issues -

- **Advertising Limited Coverage**
  - How much coverage information does the uCDN really need to make a selection of a dCDN?
- **Capabilities and Dynamic Data**
  - Some capabilities of a dCDN are static, and some are highly dynamic
  - How much dynamically changing information does the uCDN really need for dCDN selection?
- **Advertisement versus Queries**
  - Synchronous query/response model vs. dCDN state replication model, which works better in what scenario?
    - Does the uCDN always query the dCDNs?
    - Or does the dCDN always push information to the uCDNs?
- **Which Relationship / Business Model between uCDN & dCDN?**
  - What is the assumed business relationship between the uCDN and the dCDN?
  - Is the uCDN always the "authoritative" CDN provider which transitively has itself contracted several downstream CDN providers?

Latest Discussions in the Design Team

- **Agreement in the Design Team**
  - A footprint can probably be defined as “willingness to serve”, but other information is needed by the uCDN to judge the delivery quality associated with choosing a given dCDN for a given end user request
    - Otherwise, any dCDN can claim it can deliver to the whole world
  - Part of the Footprint Advertisement will happen in contractual agreements
    - E.g. additional information to judge the delivery quality associated with a given dCDN footprint might be defined in contractual agreements (i.e. outside of the CDNI RR interface)
    - dCDN contractual agreements about “delivery quality” will probably be based on high-level aggregated statistics (i.e. not too detailed)
  - dCDN advertisement shall not contain *highly* dynamic QoS information
    - E.g. real-time delivery performance metrics, CDN resource load, ...
    - Hard to agree on this, and certainly not feasible to specify within charter time-frame
  - Monetary costs are out of scope of dCDN advertisement

Latest Discussions in the Design Team

- **Open Issues (ongoing discussion)**
  - What exactly is a footprint based on?
    - prefix, geographic area, ASN, or location of surrogates/resources?

    (agreement in design team that at least some reachability type (e.g. prefix) needs to be supported, but potentially also advertisement of dCDN resources can be useful)
  - How exactly can a given dCDN derive its footprint?
  - Given that a big part of footprint advertisement will actually happen in contractual agreements, what exactly still needs to be advertised by the CDNI RR interface?
    - E.g. updates about temporal failures?
  - What capabilities are useful and how can we express them?
    - Should capability advertisement include only static attributes of the CDN, or should it factor in dynamic attributes as well?

Discussion & Outlook

Discussion

- Feedback / opinions from the WG to these questions?

Outlook

- Plan is to have more design team phone calls until next IETF
- Document has the goal to capture answers to the questions …
  - And to steer the discussion by raising new questions coming up

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