CDNI Request Routing:
Footprint and Capabilities Semantics Draft
(draft-ietf-cdni-footprint-capabilities-semantics-00)

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Background & Goals

- **Objectives of draft-ietf-cdni-footprint-capabilities-semantics**
  - Captures the semantics of the CDNI Request Routing FCI interface
    - i.e. the desired meaning and what "Footprint and Capabilities Advertisement" is expected to offer within CDNI
  - Defines mandatory types of footprint and capabilities to be supported by protocol solutions for the CDNI FCI
  - Placeholder for open issues

Summary of Conclusions up to now (1)

Capabilities

- Agreement that actual CDNI details / concrete contracts not known at this point in time, therefore should go for flexible protocol with few mandatory capabilities

- Agreement on small set of mandatory capabilities
  - Delivery Protocol (e.g., HTTP vs. RTMP)
  - Acquisition Protocol (for acquiring content from a uCDN)
  - Redirection Mode (e.g., DNS Redirection vs. HTTP Redirection as discussed in [I-D.ietf-cdni-framework])
  - Capabilities related to CDNI Logging (e.g., supported logging mechanisms)
  - Capabilities related to CDNI Metadata (e.g., authorization algorithms or support for proprietary vendor metadata)

- Agreement to have a registries for mandatory capabilities, where the registry and how to fill the registry would be defined by CDNI documents

Summary of Conclusions up to now (2)

Footprint

- Agreement that for footprint there will be a small set of mandatory identifier types with a clear semantic, and the protocol will be open for future optional types of footprints (similar as with capabilities)
  → see more next slides

- Agreement on mandatory types of footprint
  - ISO Country Code (potentially also DVD-Region)
  - AS number
  - IP-prefixes

Footprint as a constraint

- For all of the mandatory-to-implement footprint types, dCDN footprint advertisements tell the uCDN to limit when it would delegate a request to the dCDN

- IP prefixes or ASN(s)
  - Signals to the uCDN that it should consider the dCDN a candidate only if the IP address of the request routing source falls within the prefix set or ASN
  - How the uCDN determines what address ranges are in an ASN will remain undefined

- Similar for country codes
  - uCDN should only consider the dCDN a candidate if it covers the country of the request routing source
  - How the uCDN determines the country of the request routing source will remain undefined

- Constraints are additive
  - Advertise both types and it narrows the dCDN candidacy cumulatively

Optional footprint types

- Our base spec will need to define:
  - A process for specifying optional footprint types
    - IANA registry, but with what level of oversight?
      - Should the WG decide, or an expert reviewer, or just a free-for-all?
    - A template that all optional footprint types must include in their specification
      - What design choices need to be captured?
  - The protocol mechanism for negotiating them
    - Should optional footprint types be ignored if not understood?
    - Should it be possible to specify footprint types that must be understood or the advertisement will be rejected
      - What would happen when an advertisement is rejected?

Open Issues (1)

- What is the service model of the FCI? Push or pull model?
  - ➢ We don't know yet, let the solutions propose their properties and argue for push or pull or hybrid

- Does a footprint need to explicitly include the "transitive reachability" of a dCDN to further dCDNs that may be able to serve content to users on behalf of dCDN?
  - ➢ Does not have to, but may very well do so

- What is the assumed business relationship between the uCDN and the dCDN?
  - ➢ No assumptions, that is why we go for a flexible solution

- How exactly can a given dCDN derive its footprint?
  - ➢ Not necessary to describe that in the solution protocol

Open Issues (2)

- Should the footprint/capabilities advertisement interface only signal the delta with respect to a given state / contract?
    - ➤ let the solutions propose and argue their approach

- What is the exact process for specifying optional footprint or capability types? For instance, for an IANA registry, what level of oversight is needed (should the WG decide, or an expert reviewer, or just a free-for-all)?
    - ➤ Agreement on two-tier approach: "IANA spec-required" for new optional types of footprint/capabilities; "proposed standard" for new mandatory types of footprint/capabilities

- How will the support for optional types of footprint/capabilities be negotiated?
    - ➤ Solution protocols need to specify how to handle failure cases or non-supported types of footprint/capabilities; semantics documents needs to give guidance on how to handle advertisement failures
    - ➤ Relates to definition of mandatory / optional
    - ➤ uCDN can ignore capabilities it does not understand; if dCDN leaves out an optional capability not a problem; need to think about transitive dCDNs

Acknowledgements