CDNI Request Routing:
Footprint and Capabilities Semantics
draft-spp-cdni-rr-foot-cap-semantics-00

Jan Seedorf, Jon Peterson, Stefano Previdi

IETF 83, Paris

CDNI WG

March 30, 2012

Background / Goals

- Discussion at IETF-82 on Footprint and Capabilities Advertisement (as part of CDNI request routing)
  - Agreement 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"

- Goals of **draft-spp-cdni-rr-foot-cap-semantics-00**
  - 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
  - Eventually facilitate the choosing of one or more suitable protocols for "Footprint and Capabilities Advertisement" within CDNI Request Routing

Design Decisions

- 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?

Definitions so far …
(distilled from existing documents)

- **Footprint …**
  - Could be defined by "layer-3 coverage", where coverage refers to a set of prefixes, a geographic region, or similar boundary.
  - Could be defined as the set of the IP addresses of the caches deployed by a CDN.
  - Potentially may include "the connectivity of the dCDN to other CDNs that may be able to serve content to users on behalf of dCDN".
  - Could alternatively be defined as "a class of end user requests a dCDN is willing to serve".

- **Capabilities …**
  - Are types of information that allow a uCDN to determine if a downstream CDN is able (and willing) to accept the delegated content request.
  - May change dynamically based on the state of the network or a cache.
  - Types
    - Cache Capabilities (load, available resources, …)
    - Resource Capabilities (supported range of playback devices, delivery technology, …)
    - Network Capabilities (QoS guarantees, delivery priority, …)
    - Administrative capabilities (probably out of scope: administrative limits, delivery fees, …)

Open Issues and Questions (1)

- **Which Service Model?**
  - 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?

Open Issues and Questions (2)

- **What is a footprint?**
  - Should footprint advertisement be based on prefixes, on cache addresses, or on other facts?
  - Does a footprint need to include the "reachability" of the dCDN to other CDNs that may be able to serve content to users on behalf of dCDN?

- **What kinds of capabilities are needed?**
  - Should capability advertisement include only static attributes of the CDN, or should it factor in dynamic attributes as well?
  - How can the dCDN express the associated costs of delivery, either monetary or virtual costs, to the uCDN for the actual delivery? Is this in scope of this interface?
  - Are monetary delivery costs explicitly in scope of capabilities advertisement?

Discussion & Outlook

Discussion

- Feedback / opinions from the WG to these questions?

Outlook

- Document has the goal to capture answers to the questions …
- And to steer the discussion by raising new questions coming up

Acknowledgements