

**CDNI Request Routing:  
Footprint and Capabilities Semantics Draft  
(draft-spp-cdni-rr-foot-cap-semantics-02)  
and  
Progress report from the "Footprint and  
Capabilities Advertisement" Design Team**

**Jan Seedorf, Jon Peterson, Stefano Previdi**

IETF 85, Atlanta  
CDNI WG  
November 8, 2012

# 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, mailing list discussions, and side meetings at IETF-84 and IETF-85 since then

# Goals

- **Goals of draft-spp-cdni-rr-foot-cap-semantic**
  - 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:
  - Capturing latest discussions in design team (see next slides)

# Status Quo at IETF-84

- **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

# Status Quo at IETF-84

- **Open Issues regarding Footprint**

- 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?

- **Open Issues regarding Capabilities**

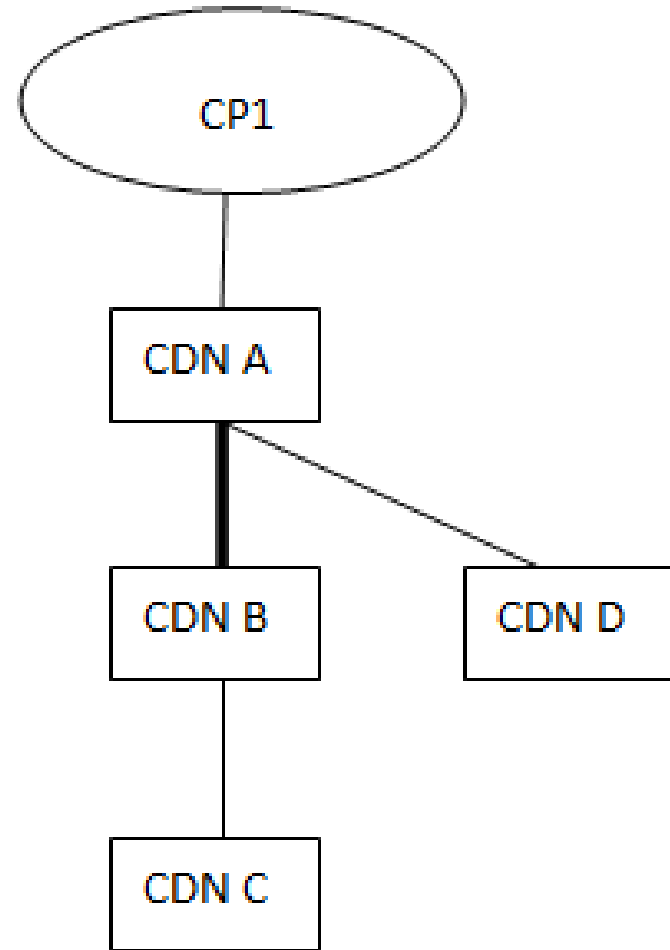
- What capabilities are useful and how can we express them?
  - Should capability advertisement include only static attributes of the CDN, or should it factor in dynamic attributes as well?

# Discussions in the Design Team since IETF-84

- Discussion has mostly focused on capabilities
- What is the exact relationship between contractual agreements and CDNI advertisement?
  - e.g. is advertisement supposed to “update” contractual information?
  - How independent is advertisement from contracts?
- Details of CDNI contracts are not clear at this point in time
  - What does this imply for standardizing advertisement?
  - Should the protocol have a small subset of mandatory capabilities and in addition allow for flexibility to exchange more information?
- dCDN resource capabilities seem most important type of capabilities
  - i.e. supported range of playback devices, supported range of delivery technologies, specific delivery protocols, ...
- Need to find out what types of capabilities are definitely needed and which ones should be optional
  - Focus on key use case(s) should drive this discussion

# Focus on Use Case to drive discussion

- Agreement on use case proposed by Anne and Emile
  - Contains delivery via different dCDNs (B and D) by uCDN A for different footprints and different delivery protocols
  - Contains transitive dCDN delivery (CDN C)
  - Considers partial changes in dCDN capabilities and what needs to be advertised in such cases



# Discussions in the Design Team at IETF-85

- Agreement that the following capabilities must be supported
  - "delivery protocol"
    - agreement to have a registry for "delivery protocol" where the registry and how to fill the registry would be defined by CDNI documents
  - "acquisition protocol"
    - acquisition protocol may be dependent on delivery protocol
    - probably the same registry can be used for delivery protocol and acquisition protocol
  - "redirection mode"
    - I.e. DNS iterative, DNS recursive, HTTP iterative, HTTP recursive
  - Capabilities that refer to other CDNI interfaces
    - Logging: needed, but details not clear yet
    - Metadata: for some metadata actual supported values need to be advertised as capabilities
    - need to align the work between metadata / logging / request routing interfaces with capabilities advertisement
- Overall: good progress, but still some open issues
  - How do different capabilities depend on each other (cascading / matrix)?
  - URI signing: how many details need to be advertised?
  - What about versioning (e.g. metadata v.1 vs. metadata v.2)?



# Discussion & Outlook

## Discussion

- Feedback / opinions from the WG to these discussions and the status quo of agreements?

## Outlook

- When to close design team and bring work back to CDNI WG?
  - What is the expected outcome of the design team?

# Acknowledgements

Acknowledgement: Jan Seedorf is partially supported by the CHANGE project (CHANGE: Enabling Innovation in the Internet Architecture through Flexible Flow-Processing Extensions, <http://www.change-project.eu/>), a research project supported by the European Commission under its 7th Framework Program (contract no. 257422). The views and conclusions contained herein are those of the authors and should not be interpreted as necessarily representing the official policies or endorsements, either expressed or implied, of the CHANGE project or the European Commission.

Jan Seedorf has been partially supported by the COAST project (COntent Aware Searching, retrieval and sTreaming, <http://www.coast-fp7.eu>), a research project supported by the European Commission under its 7th Framework Program (contract no. 248036). The views and conclusions contained herein are those of the authors and should not be interpreted as necessarily representing the official policies or endorsements, either expressed or implied, of the COAST project or the European Commission.