CDNI Working Group (CDN Interconnect)

Francois Le Faucheur

Richard Woundy

Welcome to CDNI

- Chairs:
  - Francois Le Faucheur
  - Richard Woundy
- Jabber scribe
  - cdni@jabber.ietf.org
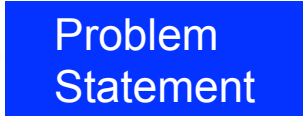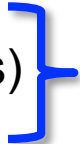- Notes
- Blue sheet

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Working Group Milestones

- Dec 2011 Submit CDNI problem statement to IESG as Informational
- Mar 2012 Submit CDNI use cases to IESG as Informational
- Jun 2012 Submit CDNI framework to IESG as Informational
- Jun 2012 Submit CDNI requirements to IESG as Informational
- Dec 2012 Submit specification of the CDNI Request Routing interface to IESG as Proposed Standard
- Dec 2012 Submit specification of the CDNI Logging interface to IESG as Proposed Standard
- Dec 2012 Submit specification of the CDNI Control interface to IESG as proposed Standard
- Jun 2013 Submit specification of the CDNI Metadata Distribution interface to IESG as Proposed Standard
- Jun 2013 Recharter or dissolve

Agenda (1/2)

- Agenda bashing & Introduction: Chairs (5 mins)
- Discussion on scope & interface split: Chairs (10 mins)

- Problem Statement, draft-ietf-cdni-problem-statement-01: Ben Jenkins (10 mins)

  Problem Statement

- Use Cases, draft-ietf-cdni-use-cases-00: Giles Bertrand (10 mins)
- Advanced Use Cases, draft-fmn-cdni-advanced-use-cases-00: David Griffin (5 mins)

  Use Cases

- Requirements, draft-ietf-cdni-requirements-01: Kent Leung (10 mins)
- Additional Requirements for ATIS CSF, draft-manning-cdni-additional-csf-reqs-00: Serge Manning (10 mins)

  Requirements

- Framework, draft-davie-cdni-framework-01: Aaron Falk (15 mins)

  Framework

Agenda (2/2)

- ALTO for CDNI Request Routing, draft-seedorf-alto-for-cdni-00: Jan Seedorf (10 mins)
- CDNI Footprint Advertisement, draft-previdi-cdni-footprint-advertisement-00: Stefano Previdi (10 mins)
- Request Routing Protocol for CDNI, draft-xiaoyan-cdni-request-routing-protocol-00: Xiaoyan He (10 mins)

Request Routing Interface

- CDNI Core Metadata, draft-caulfield-cdni-metadata-core-00: Kent Leung (10 mins)
- CDNI Interconnect Metadata, draft-jenkins-cdni-metadata-00: Ben Jenkins (10 mins)
- CDNI Metadata Interface, draft-ma-cdni-metadata-00: Kevin Ma (10 mins)
- Metadata for CDNI, draft-stephan-cdni-usecases-metadata-00: Emile Stephan (10 mins)

Metadata Interface

- Conclusion and next steps" Chairs (5 mins)

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Distribution of Functionality across CDNI Interfaces (1/4)

- Distribution of functionality across the 4 CDNI Interfaces is still "subject to change"

- Problem-statement says:
  - "Note that the actual grouping of functionalities under these four interfaces is considered tentative at this stage and may be changed after further study (e.g. some subset of functionality be moved from one interface into another)."

- Note: Problem-Statement can move ahead without final decision on that question

Distribution of Functionality across CDNI Interfaces (2/4)

- The Request Routing Interface actually comprises two parts

- Framework says:

   " We may think of the request routing interface as comprising two parts:

   1. the asynchronous advertisement of footprint and capabilities by a dCDN that allows a uCDN to decide whether to redirect particular user requests to that dCDN; and

   2. the synchronous operation of actually redirecting a user request.

   "

Distribution of Functionality across CDNI Interfaces (2/4)

- The Re...
  parts

- Framew...

  " We may think o... routing interface as comprising two parts:

> **"*Request Routing Interface – Footprint &Capabilities Advertisement*"**

1. the asynchronous advertisement of footprint and capabilities by a dCDN that allows a uCDN to decide whether to redirect particular user requests to that dCDN; and

2. the synchronous operation of actually redirecting a user request.

> **"*Request Routing Interface – Redirection*"**

Distribution of Functionality across CDNI Interfaces (3/4)

- "*Request Routing Interface – Footprint & Capabilities Advertisement*" candidate protocols:
  - BGP (previdi-cdni-footprint-advertisement)
  - ALTO (seedorf-alto-for-cdni)
  - HTTP/Web-services (xiaoyan-cdni-request-routing-protocol)
- "*Request Routing Interface – Redirection*" candidate protocols:
  - HTTP & DNS (xiaoyan-cdni-request-routing-protocol)
  - HTTP/Web-services
- It is possible/likely that "*Request Routing Interface – Footprint & Capabilities Advertisement*" and "*Request Routing Interface – Redirection*" end up being progressed in separate documents

Distribution of Functionality across CDNI Interfaces (4/4)

- "Triggers" (aka Content/Metadata Purge/Pre-positioning requests) can be "seen" as belonging to the Control Interface since that interface is defined as allowing the "CDNI Control" system in interconnected CDNs to communicate (*)

- Alternatively, Triggers can be "seen" as belonging to the Metadata Interface since (i) they need to be processed by same "logical entity" in dCDN as Metadata and (ii) apply at similar fine granularity (*)

- Still under discussion

- Actual proposals for support of Triggers will help the discussion

(*) Note that this is an over-simplified and incomplete representation of the two viewpoints
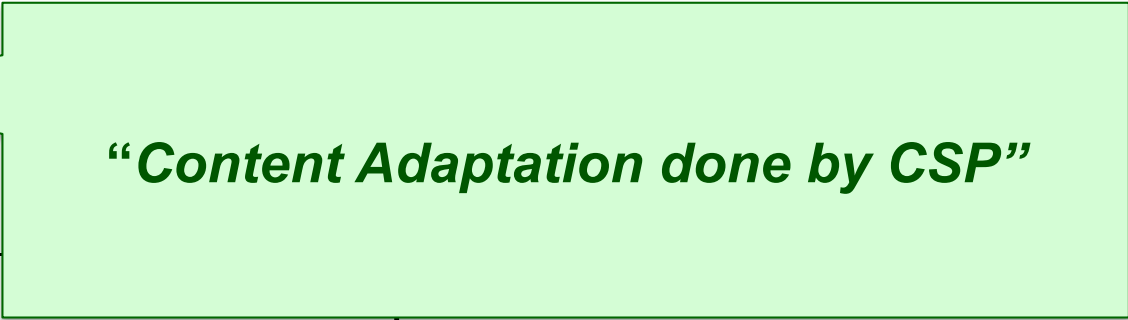
Content Adaptation (1/4)

- Content Adaptation has been discussed extensively on the list

- We need to make a call

- Here is the plan brought to you by your favorite co-chairs:
  - Let's NOT reopen the discussion right now
  - Let the chair recap on the options
  - Let's do a Hum test right now
  - Let's validate it on the list right after IETF-82

Content Adaptation (2/4)

- **A**: To deal with multiple terminals/resolutions/qualities/access-technologies, <u>CSPs commonly perform content adaptation themselves</u> and support multiple representations of the same asset, which are handled as independent "contents" from a delivery viewpoint

  - -> this approach can be supported over a CDNI mesh <u>without placing any additional requirements</u> on the CDNI solution

- **B**: To deal with multiple terminals/resolutions/qualities/access-technologies, <u>CSPs commonly request their authoritative CDN to perform content adaptation on their behalf</u>, and therefore generate multiple representations of the same asset, which are handled as independent "contents" from a delivery viewpoint

  - -> this approach can be supported over a CDNI mesh <u>without placing any additional requirements</u> on the CDNI solution (*)

(*) this approach may place requirements on a CSP→uCDN interface, but that is outside the scope of the CDNI WG

Content Adaptation (2/4)

- **A**: T... ...ccess-technologi... ...on themselve... ...ame asset, which are ... ...very viewpoint

  "Content Adaptation done by CSP"

  -> this approach can be supported over a CDNI mesh <u>without placing any additional requirements </u>on the CDNI solution

- **B**: To deal with multiple terminals/resolutions/qualities/access-technologi... ...e CDN to perform ... ...generate multiple re... ...ndled as independe...

  "Content Adaptation done by uCDN"

  -> this approach can be supported over a CDNI mesh <u>without placing any additional requirements </u>on the CDNI solution (*)

(*) this approach may place requirements on a CSP→uCDN interface, but that is outside the scope of the CDNI WG

Content Adaptation (3/4)

- **C**: To deal with multiple terminals/resolutions/qualities/access-technologies, <u>one can envision another solution </u>where:
  - The CSP deals with a single (or low number of) representation of an asset
  - The authoritative CDN deals with a single (or low number of) representation of an asset
  - A downstream CDN locally performs (further) content adaptation to serve the optimal representation for each request

-> this approach would place <u>significant additional requirements</u> on the CDNI solution (e.g. uCDN distributes CSP Content Adaptation policy, dCDNs advertise their Content Adaptation capabilities)

Pros: Squeezes an additional reduction of inter-CDN acquisition traffic (e.g. reduce from 1000s to 1 per-asset, instead of "only" reducing from 1000s to 10 per asset) and of content items to be cached.

Cons: Requires "processing" resources in dCDN for on-the-fly content adaptation

Content Adaptation (3/4)

- **C**: To ~~be~~ ~~the~~ ~~di~~ ~~different~~ cess-
technologie   "**Content Adaptation done by dCDN in a managed way**"

  - The CSP ~~~~ ~~~~ ~~~~ ~~~~ ~~~~ asset
  - The autho ~~~~ ~~~~ ~~~~ ~~~~ sentation of an asset
  - A downstream CDN locally performs (further) content adaptation to serve the optimal representation for each request

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  Pros: Squeezes an additional reduction of inter-CDN acquisition traffic (e.g. reduce from 1000s to 1 per-asset, instead of "only" reducing from 1000s to 10 per asset) and of content items to be cached.

  Cons: Requires "processing" resources in dCDN for on-the-fly content adaptation

Content Adaptation (4/4)

- Option 1): CA by dCDN not supported in initial scope, added in CDNIv2

- Option 2): Unmanaged CA by dCDN supported in initial scope, Managed CA by dCDN added in CDNIv2
  - Minor additional CDNI requirements:
    - ability for uCDN to signal whether CSP allows/disallows Content Adaptation (i.e. additional flag in metadata)

- Option 3): Managed CA by dCDN supported in initial scope
  - Additional CDNI solution requirements:
    - ability for uCDN to signal full CSP Content Adaptation policy (i.e. specify a whole set of objects in metadata)
    - Ability for dCDNs to advertise their Content Adaptation capabilities (i.e. specify a whole set of capabilities in Request Routing interface)

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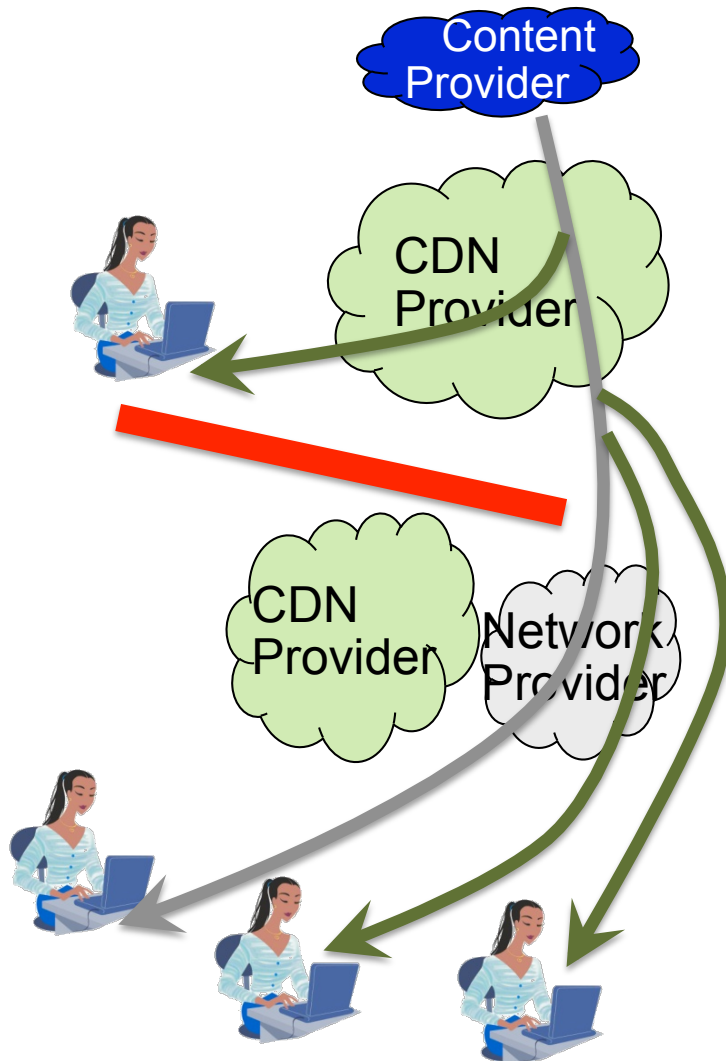
  Framework

Next Steps

- WG Last Call on problem-statement?

- WG Last Call on use-cases ?

- Adopt framework as WG document?

- Converge on proposals for Metadata

- Converge on proposals for "Request Routing Interface – Footprint & Capabilities Advertisement"

- Discussion on proposal for "Request Request Routing Interface – Redirection"

- Start contributions on candidate protocols for remaining CDNI interfaces (Logging, Control, Triggers)

Backup Slides

CDNI – What is it about?

Today: CDNs cannot interwork and operate in silos

With CDNI: CDNs could interwork (without changing internal CDN operation)

Content Provider

CDN Provider

CDN Provider

Network Provider

CDNI Gateway

CDNI Protocols/APIs

CDNI Gateway