

CDNI Requirements

draft-lefaucheur-cdni-requirements-01

Francois Le Faucheur, Cisco
Mahesh Viveganandhan, Cisco
Grant Watson, BT
Yiu Lee, Comcast

IETF 80, Prague

Requirements Structure

- **Sets of Requirements**
 - Generic Requirements
 - Control Protocol Requirements
 - Request Routing Protocol Requirements
 - Metadata Distribution Protocol Requirements
 - Logging Protocol Requirements
 - Security Requirements
- **Scopes (in each set):**
 - Initial scope (within potential WG initial charter)
 - MUST: strong convergence that it is required “day1”
 - SHOULD/MAY: needs further arbitration on whether it can be supported “day1”
 - Future scope (outside potential WG initial charter)

Generic Requirements

- R1: Leverage existing protocols.
- R2: No change in the user agent (the client).
- R3: CDNI solution must not be intrusive into CDNs:
 - dCDN and uCDN are not required to know each other's cache topology, cache status,...
- R4 & R5: HTTP is the first supported protocol for Delivery and Acquisition.
- R8: [should] support cascaded CDNs.
- R9: [should] support any kind of CDNI topology (e.g. Star, Ring, Tree etc.)
- R10: CDNI must prevent looping
- R11: CDNI must consider known issues with 3rd party references

Control Protocol Requirements

- **These requirements are defined to:**
 - actual content delivery communication for management/bootstrapping prior to the
 - Enable
 - to trigger actions in dCDN
- **Some highlights:**
 - R15: Content Purge request by uCDN to dCDN (invalidate/delete an object).
 - R16: Content Purge Acknowledgment by dCDN to uCDN.
 - R17: Trigger Metadata pre-positioning from uCDN to dCDN.
 - R18: [should] Trigger content pre-positioning from uCDN to dCDN.

Request Routing Protocol Requirements

These requirements are defined to allow the uCDN Routing-Request System (RRS) to delegate a request to the dCDN RRS.

- **Highlights:**
 - R27: dCDN can refuse further request delegations (“busy” tone)
 - R28: [should] dCDN advertises capabilities (e.g. footprint, content types), resources (e.g. streaming bandwidth) and affinities (e.g. delivery cost)
 - R30: [may] dCDN advertises policy/admin-info (e.g. max requests per second, max aggregate volume)
 - R31 & R32: efficient for small objects (aka DNS-based) and for large objects (aka HTTP-based)
 - R33 & R34: Support both Recursive Request Routing and Iterative Request Routing.
 - R37: Pass the user agent location information.
 - R38: Pass the content metadata location information.

Metadata Distribution Protocol Requirements

- **These requirements are defined to allow the communicate to dCDN the “distribution metadata”**
- **Highlights:**
 - R45: uCDN provides metadata to dCDN
 - R46: Support both pre-positioning and dynamic content acquisition
 - R47: Support metadata “Pull”
 - R48: Support metadata “Push”
 - R49 & R50: metadata must convey where/how
 - R51 & R52: Support real-time Add/Modify/Delete metadata
 - R53 & R54: Metadata data structure must support referencing a single object or a set of objects.
 - R58 & R59 : Support distribution control policies (geo-blocking, time window & authorization checks (e.g. URI signing)

Logging Protocol Requirements



In a distributed system such as CDNI, logging is used to track/analyze the chain of events (for accounting, monitoring, analytics, troubleshooting).

Highlights:

- R63: dCDN provides logging to uCDN

dCDN on behalf of uCDN

for content delivery performed by

Security Requirements

- R74: Support secure channel to exchange data over Internet.
- R75: Protect against DOS attack.
- R76: [should] non-repudiation of logs.
- R77: [should] Protect against spoofed log.
- R78: [may] Define a mechanism to delegate credentials to downstream CDN to acquire content from the origin.

Questions?

Two New Terms

- **Recursive CDNI Request Routing**
 - Consult the downstream CDN to make the routing decision
- **Iterative CDNI Request Routing**
 - Make the routing decision without consulting downstream CDN