



# Content Steering: a Standard for Multi-CDN Streaming

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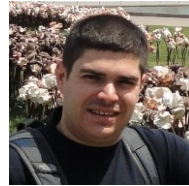
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# About us



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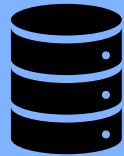
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Presenter Steering Server



PRESENTER\_PRIORITY:  
["Daniel", "Yuriy"]

# Content steering is a bit of a misnomer



We're not actually steering the content.

In fact, there is only one version of the content.

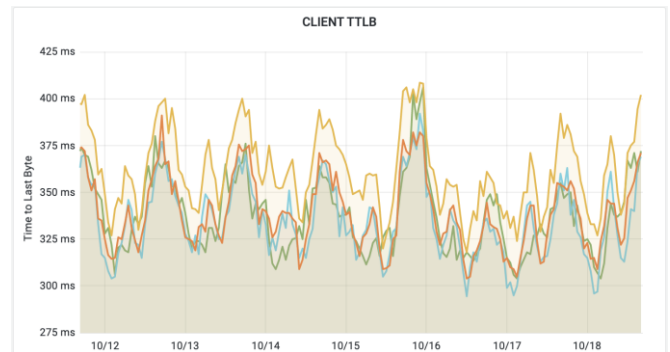
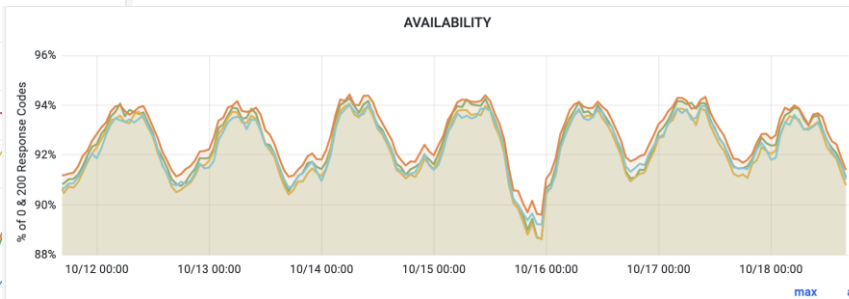
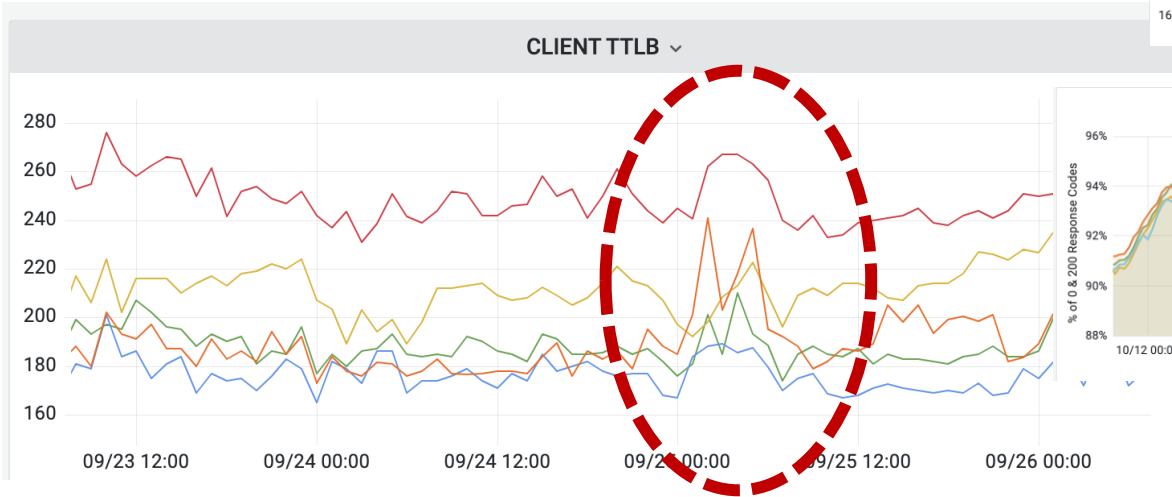
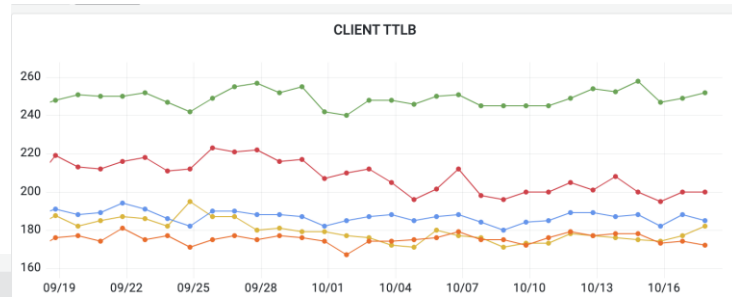
We are steering between **CDNs that host and serve the content.**

So content steering **is the art and science of switching CDNs**

# Why do we need to switch CDNs?

- **Performance**
  - CDN performance and capacity varies dramatically with AS and time.
  - Don't start new users and don't keep existing users on a poorly performing CDN
- **Capacity**
  - Switch users away midstream if a CDN is developing capacity problems due to competing traffic.
- Volumetric **contractual commits**
  - CDN A gets 35% of traffic
  - CDN B gets 65% of traffic
- **Cost**
  - Price can vary by region and even time of day.

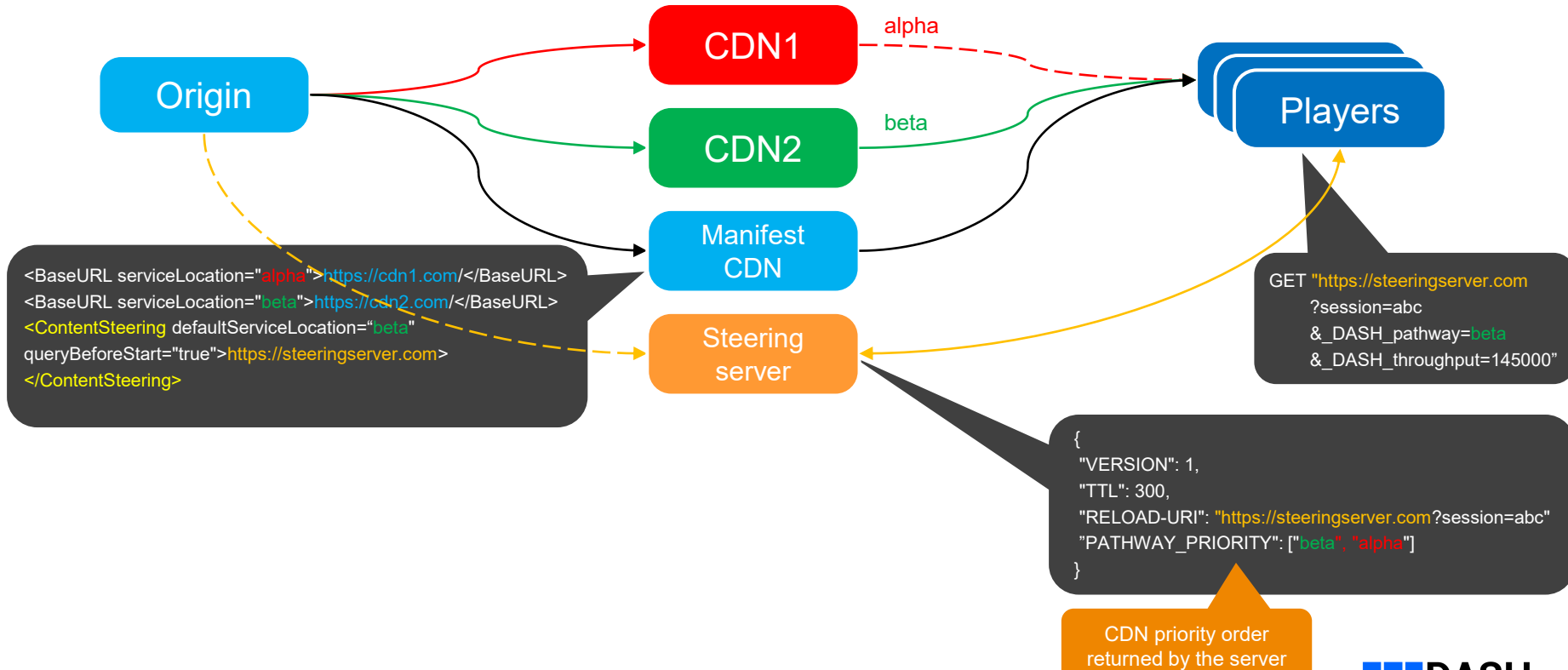
# Example: CDN performance does vary by time



[Image data courtesy of Paramount]

For best performance during this 10-minute window, switch to blue CDN and away from orange

# Content Steering – Principle of Operation








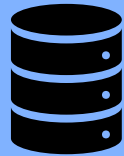
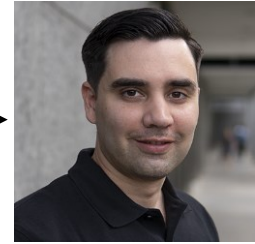
# Advantages of Content Steering

- ✓ **Standards based**
  - Soon to be published as an ETSI specification
- ✓ **Interoperable**
  - The same steering protocol and steering server can be used for both DASH and HLS
- ✓ **Backwards compatible**
  - Clients not supporting content steering will simply ignore the corresponding elements in the manifest
- ✓ **Easy integration**
  - Content steering is already supported by many media players



# Content Steering – Client Implementations

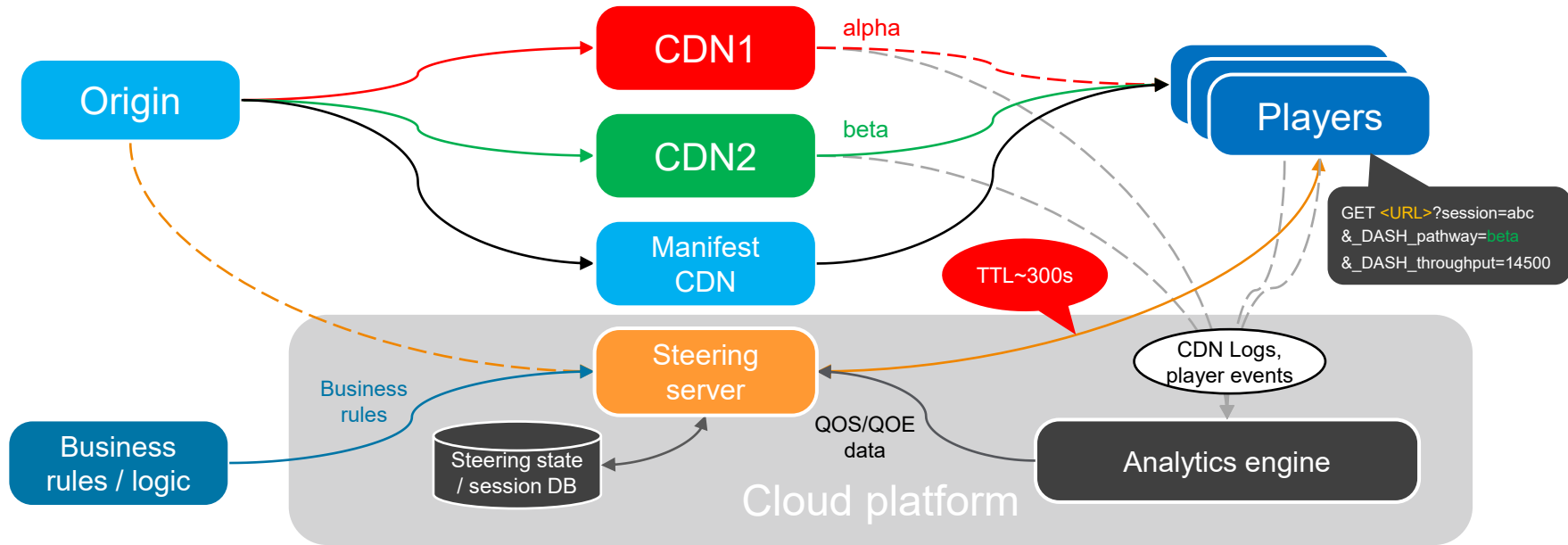
Media Player	DASH Content Steering	HLS Content Steering
 <b>dash.js</b>	since version 4.5.0	
 <b>VIDEO.JS</b>	since version 8.8.0	since version 8.8.0
 <b>Shaka Player</b>	since version 4.6.0	since version 4.6.0
 <b>ExoPlayer</b>	planned for 2024	planned for 2024
<b>hls.js</b>		since version 1.4.0
 <b>AVPlayer</b>		since iOS version 15.0



Presenter Steering Server

PRESENTER\_PRIORITY:  
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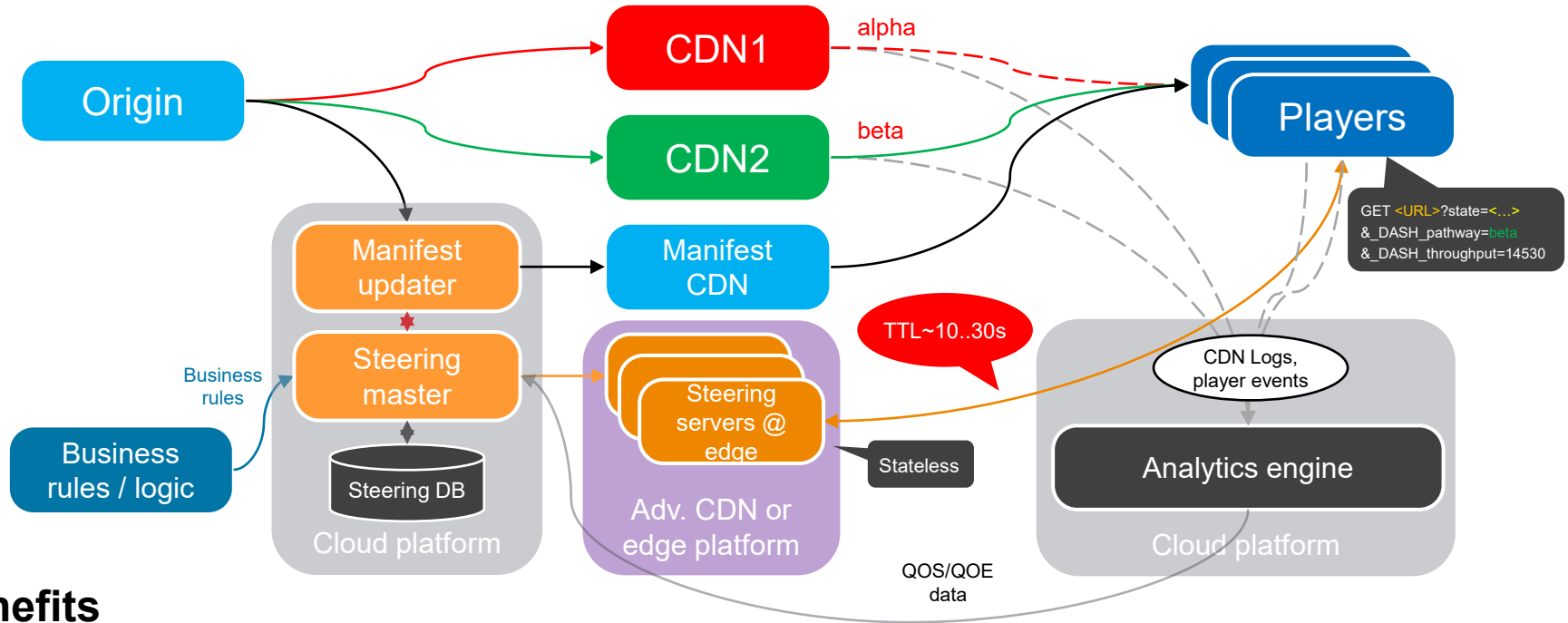
# Content Steering – Server Implementation



## Challenges / Tradeoffs

- **TTL time:** 300s default is just too long! Suitable for basic CDN load balancing. Not suitable for QOE optimizations!
- **Scalability:** the steering server should be at least as scalable as manifest CDN!
- **Costs:** reducing TTL will increase number of requests and traffic to the steering server!

# Brightcove's Content Steering @ Edge



## Benefits

- **TTL** can be much smaller; comparable to player buffer delay
- Can be used to optimize **QoE**. With shorter TTLs smart switch decisions can minimize buffering!
- **Scales** as CDN or edge platform allows. Multiple CDNs or platforms can be used for redundancy.

# Content Steering - Demonstration

The screenshot shows the Brightcove Content Steering demonstration interface on the left and a browser's network developer tool on the right.

**Brightcove Content Steering demonstration interface:**

- CDN configurations:** A table with columns: Pathway, CDN vendor, Enabled, Load allocation, Usage [MB], and an Apply button.

Pathway	CDN vendor	Enabled	Load allocation	Usage [MB]
cdn-a	Cloudfront	<input checked="" type="checkbox"/>	% 30	0
cdn-b	Fastly	<input checked="" type="checkbox"/>	% 30	0
cdn-c	Akamai	<input checked="" type="checkbox"/>	% 40	0
- Edge platform:** A dropdown menu.
- Media / Format:** A dropdown menu.
- Streaming client:** A dropdown menu and a Load button.
- Steering Data:** A section with a Request table containing fields: Timestamp, Steering URL, Pathway, Throughput, and Steering Params.
- Fragment Requests:** A table with columns: Type, Service Location, and Request URL. It lists Audio and Video.
- Steering manual controls:** A section with a CDN Order dropdown.
- Buttons:** "CDN priority order" and "CDN Selection" buttons are visible.

**Browser Network Developer Tool:**

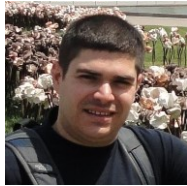
- Filter: All, Fetch/XHR, JS, CSS, Img, Media, Font, Doc, WS, Wasm, Manifest, Other. Checked:  Blocked response cookies,  Blocked requests,  3rd-party requests.
- Recording network activity... Perform a request or hit **R** to record the reload. [Learn more](#)

# Contact



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