

## HTTP OR DNS-BASED REQUEST ROUTING FOR TV CDNS?

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## CDNS AND REQUEST ROUTING

A content delivery network (CDN) needs to understand which server is best used to deliver different content to different users or client devices. There are many factors the CDN needs to consider when choosing which server the request should be routed to. This function is called request routing.

In this Solution Brief we will discuss two alternatives; DNS-based request routing and HTTP-based request routing.

1. DNS-based request routing - routing decisions are based on IP level, i.e. domain level
2. HTTP-based request routing - routing decisions are made on application level, i.e. the content that is requested by the user



Let's use an example: A viewer with a client device, let's say a mobile phone, requests content from a portal, and receives the content's URL back. The client device then asks a DNS server for the destination of this URL, ie which server should the request be routed to.

Up to this point in the example the two alternatives do not differ from each other, but let's see how the request is handled by each method below.

## DNS-BASED REQUEST ROUTING

Following the example above;

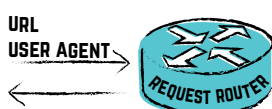
- ✓ The DNS server replies with a list of IP addresses of servers that are close to the client device, with the closest server first on the list.
- ✓ If the server chosen by the DNS server has the requested content and it is available, i.e. not overloaded, the content is then streamed to the client device.
- ✓ If the server chosen by the DNS server doesn't have the requested content, or is not available, the request is repeated to the next server on the DNS server's IP address list.



## HTTP-BASED REQUEST ROUTING

Again, following the example above;

- ✓ HTTP-based request routing works a little differently and introduces a request router to assist in finding out which server is the best to route the request to.
- ✓ The request router, like Edgware's TV Director orchestrates the requests from all clients. Since HTTP-based request routing is based on application level information it has a wider set of routing criteria compared to the DNS alternative, which only routes on the domain level.
- ✓ The request router has information on which server has the content and if the server is busy or even available. In addition it can implement policy enforcement and redirect requests based on information such as what type of content it is (Live or VOD), client type, asset name etc. This type of information is included in the url or user agent.



The content is now streamed to the client device from the TV server that fulfills the criteria set in the policy.

## WHEN TO USE DNS-BASED REQUEST ROUTING?

DNS routing was initially built for web surfing, and not for streaming video. Streaming TV-quality video puts more complex requirements on the CDN, which makes DNS-based request routing less optimal. Below are some drawbacks with using DNS in the TV CDN:

- ✓ **Reliability.** Relying only on DNS, the request is routed to the server that is closest to the client device, even if that server is down or for other reasons not accessible. It lacks information about which content is requested or the load level of the server it is routing the request to. This means that viewers can experience delays due to the time it can take to search for an available server, and in worst case receive a “black-screen”, especially if the content is a popular live event.
- ✓ **Efficiency.** The above also means that content cannot be stored in cache hierarchies as all content needs to be stored on all servers. As a consequence, cache memory is not efficiently utilized.
- ✓ **DRM.** Routing options are limited and policy based routing becomes difficult. In the absence of advanced policy enforcements it is problematic to guarantee that the CDN only lets authorized viewers access the content. This can be cumbersome in discussions with content owners on digital rights management (DRM).

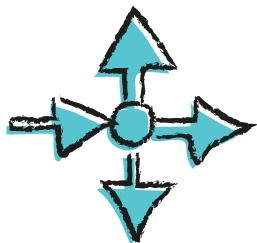
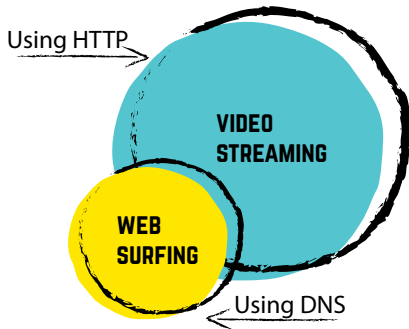
However, DNS-based request routing is ideal for web surfing, and will work well for small scale video streaming, or if your content isn't that critical.

## WHEN TO USE HTTP-BASED REQUEST ROUTING?

As mentioned earlier, HTTP-based request routing is content and server load aware, and with the possibility to do policy enforcements the request can be routed based on more sophisticated information about the content type, format, browser, client location and date & time to mention a few. This translates to a number of key values

- ✓ **SAVE STORAGE COST.** Your TV servers can store different content, i.e. one server doesn't have to store exactly the same content as another server, which optimizes the way you propagate your content.
- ✓ **SAVE BACKHAUL.** You can build hierarchical cache layers which optimizes how you cache content over different servers. This reduces the need to traverse the backhaul network to fetch content.
- ✓ **AMAZING VIEWING EXPERIENCE.** Due to the sophisticated options for routing the request to the most optimized server, and finding that server faster, the viewer will get a viewing experience without buffering or glitches. Furthermore, additional features offered in Edgeware's TV Director such as Predictive Load Balancing enable a smooth on-boarding of lots of viewers at large live events.

So in summary, if you want to deliver a scalable and amazing viewing experience, and utilize your storage resources efficiently, we'd recommend HTTP-based request routing.



**EDGEWARE TV DIRECTOR**

Centralized request router orchestrating TV delivery.

[WWW.EDGEWARE.TV](http://WWW.EDGEWARE.TV)



*Disclaimer: Specifications are subject to change without notice.*

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