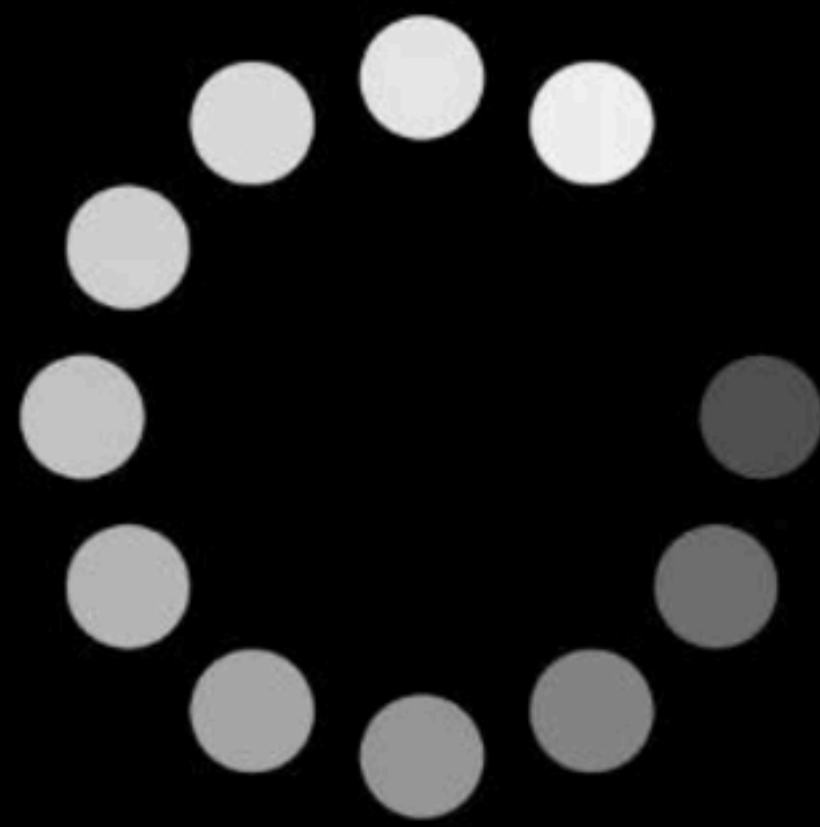


BY THIJS FERYN

# ***ACCELERATING OTT VIDEO PLATFORMS WITH VARNISH***





Buffering...

# ***CONTENT DELIVERY CHALLENGES***

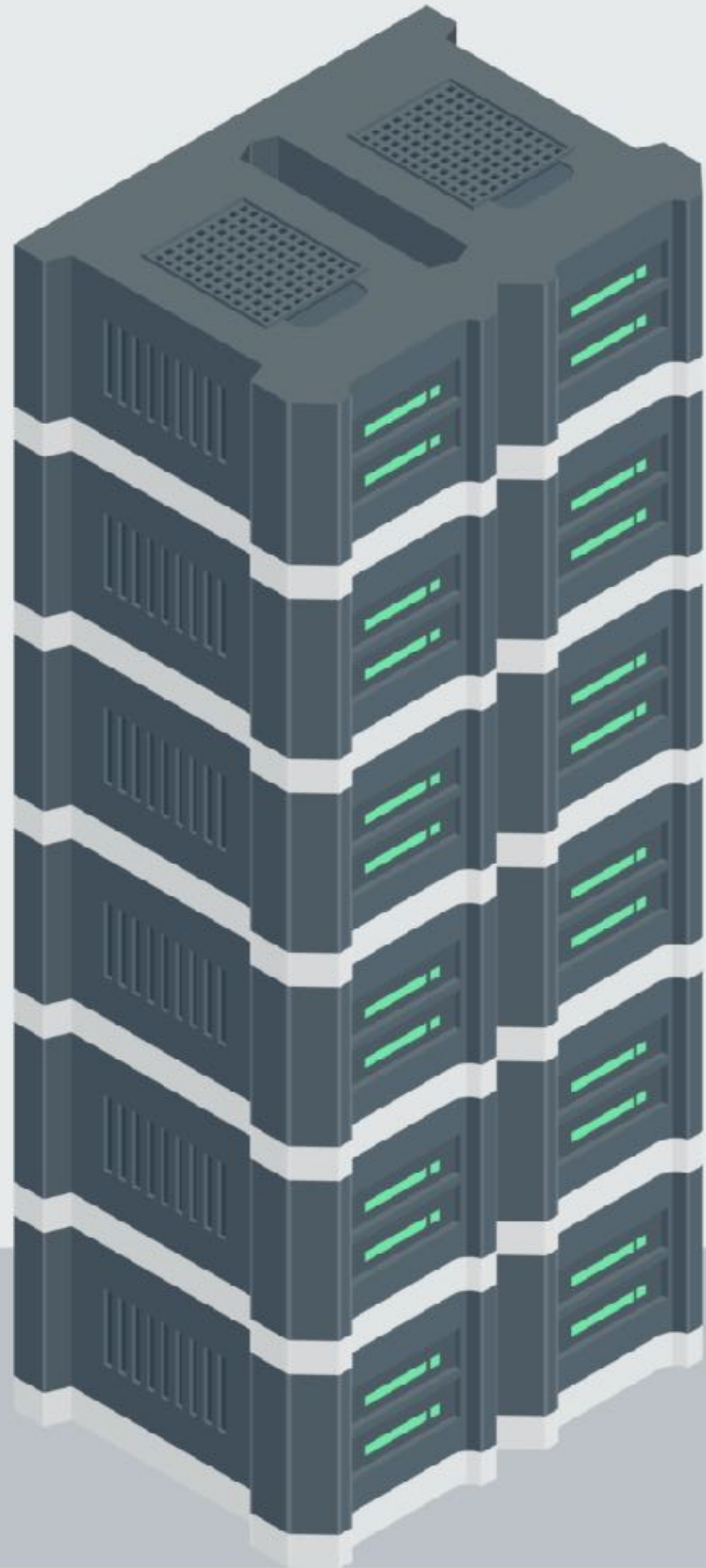


***STABILITY***



***REDUCE LATENCY***





***THROWING  
SERVERS  
AT THE PROBLEM***

***MO' MONEY***  
***MO' SERVERS***  
***MO' PROBLEMS***



# ***CACHE***







***DON'T RECOMPUTE***  
***IF THE DATA***  
***HASN'T CHANGED***

***HI,***

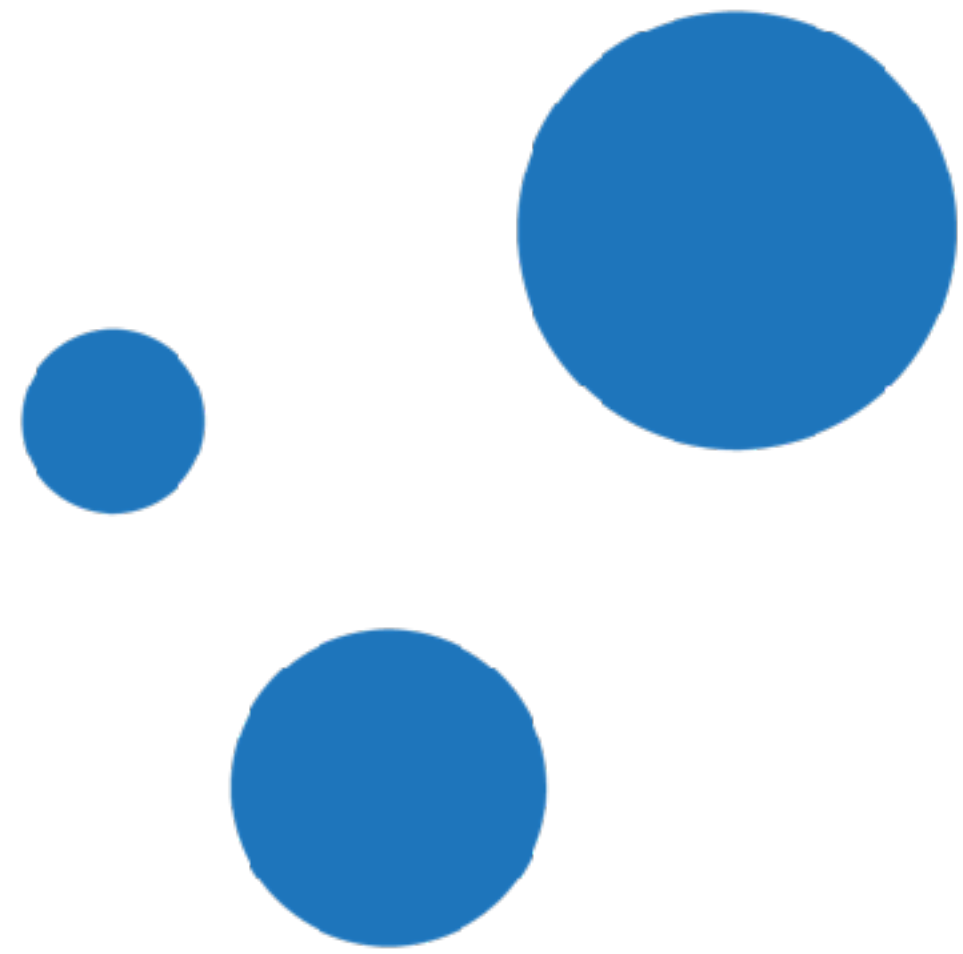


***I'M THIJS***

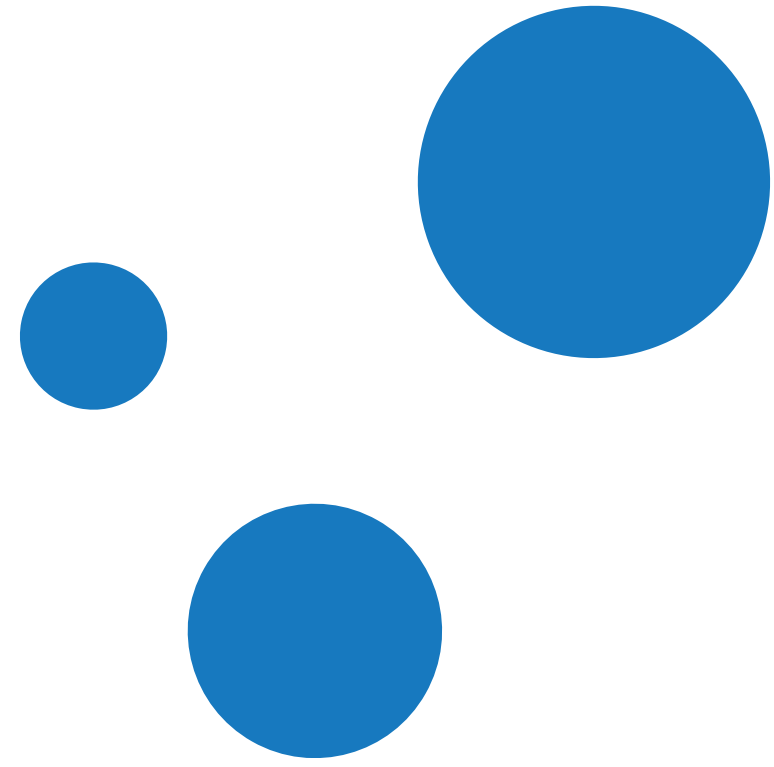


***I'M AN  
EVANGELIST***

***AT***  ***VARNISH  
SOFTWARE***



***VARNISH***  
***SOFTWARE***



***VARNISH CACHE***

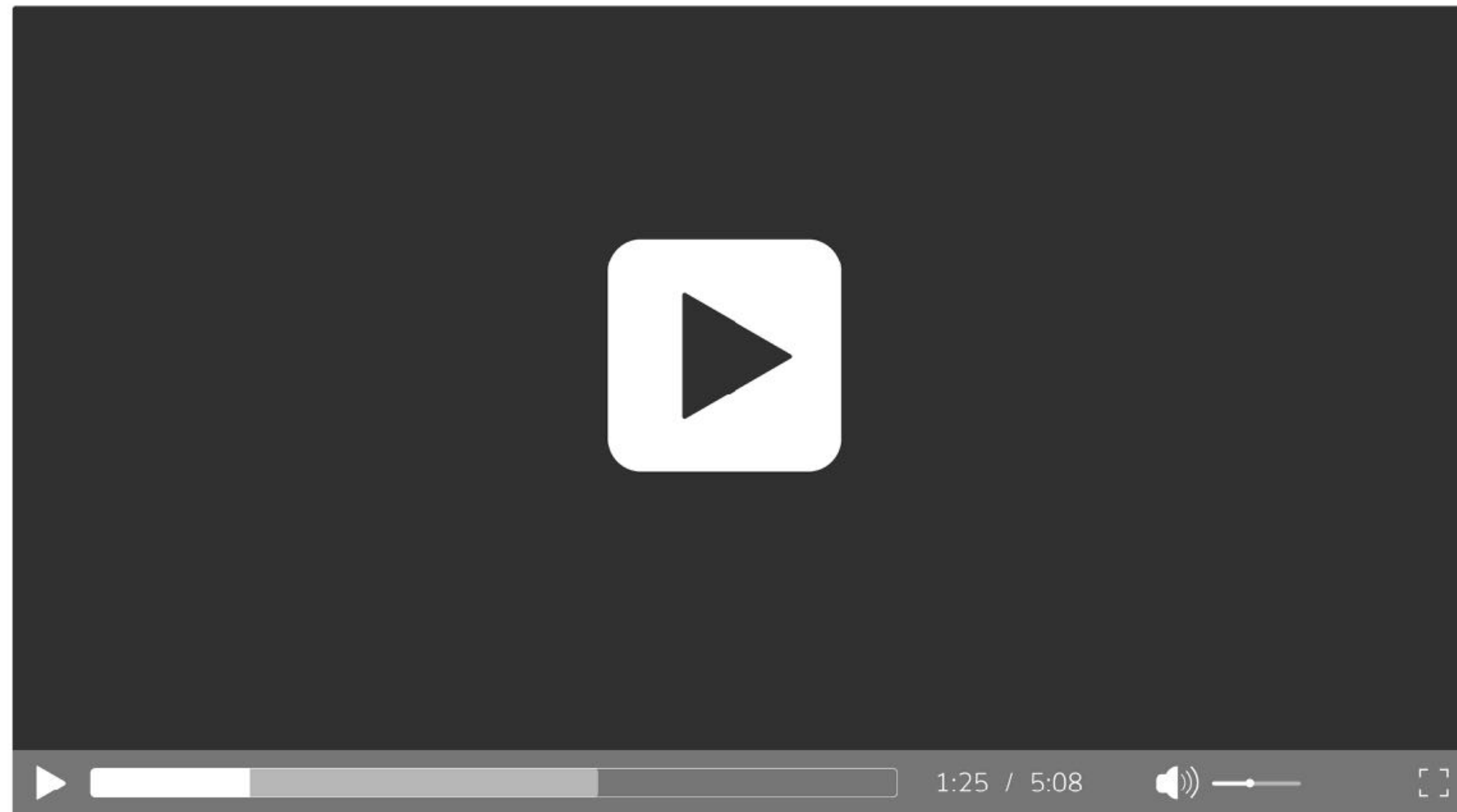
***+ - 5,000,000 WEBSITES***  
***20% OF THE TOP 10K WEBSITES***



**VARNISH ENTERPRISE**

SOFTWARE

***MORE THAN 750M VIEWERS PER MONTH***







***I'M***



***@THIJSFERYN***



O'REILLY®

Compliments of  
**VARNISH**  
SOFTWARE



# Getting Started with Varnish Cache

ACCELERATE YOUR WEB APPLICATIONS

Thijs Feryn

# ***VIDEO IS BIG & BROAD INDUSTRY***



***DELIVERY***



Handwritten character: 丸

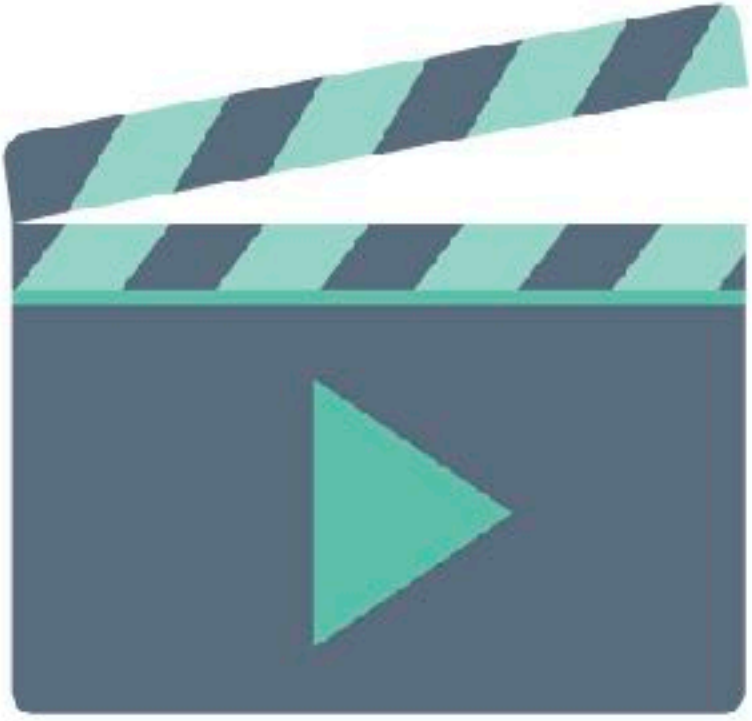
Handwritten text: 丸印

Handwritten symbols: : / /

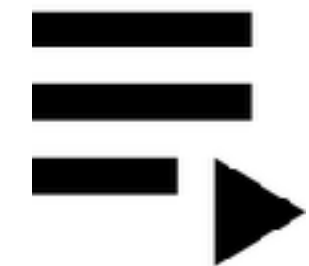
Handwritten symbols: 〰〰〰〰〰〰〰〰

**THESE WILL BE  
CACHED**

**HLS  
STANDARD**



***STREAM.M3U8***



***STREAM\_01.TS***



***STREAM\_02.TS***

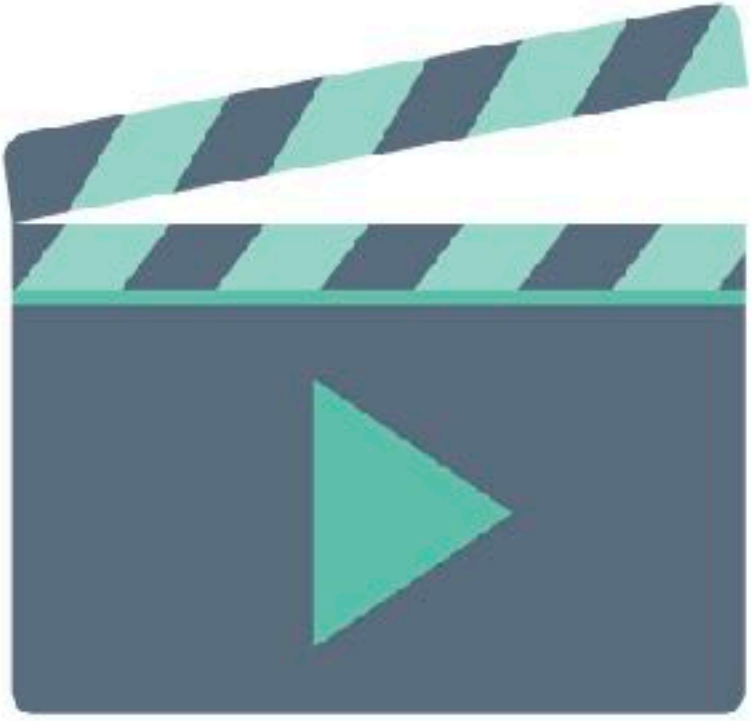


***STREAM\_03.TS***

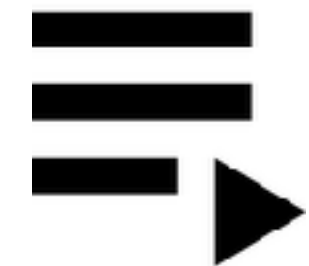


**THESE WILL BE  
CACHED**

**MPEG-DASH  
STANDARD**



***STREAM.MPD***



***INIT.MP4***



***STREAM\_02.M4S***



***STREAM\_03.M4S***





# ***NORMALLY***

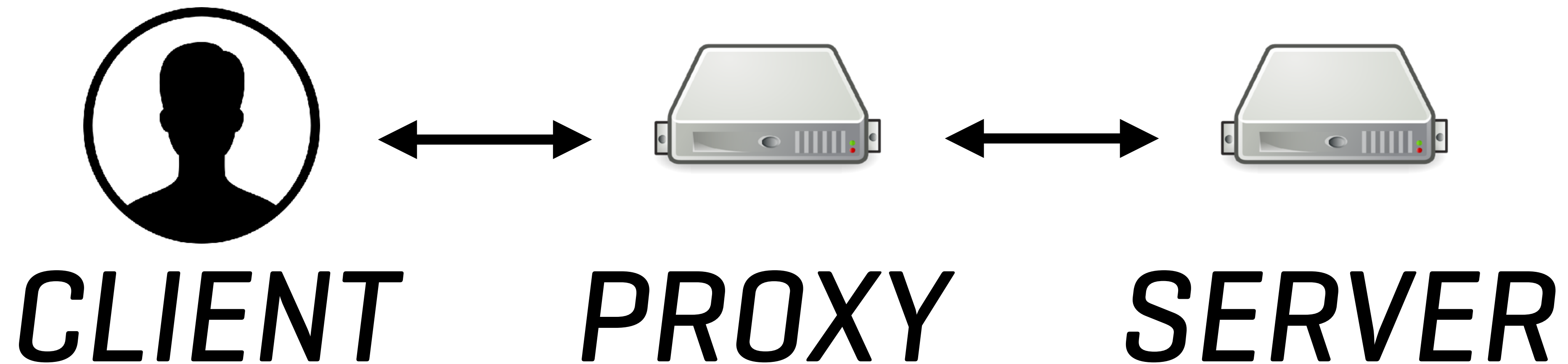


***CLIENT***



***SERVER***

# ***WITH REVERSE CACHING PROXY***



***WHY NOT  
USE A CDN?***



***VARNISH IS CDN SOFTWARE!***

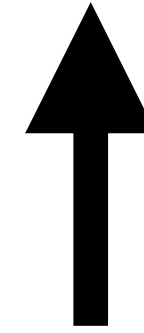
***WHY IS VARNISH  
SO POWERFUL?***



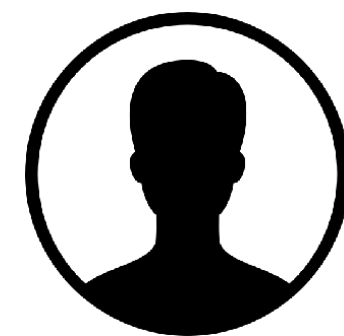
***BUILT FOR THE JOB***



***ORIGIN***



***VARNISH***



SINGLE BACKEND  
FETCH

QUEUED  
CONNECTIONS

***REQUEST  
COALESCING***

***STREAMING***

**STREAM  
CONTENT TO CLIENT  
WHILE IT'S BEING  
FETCHED**





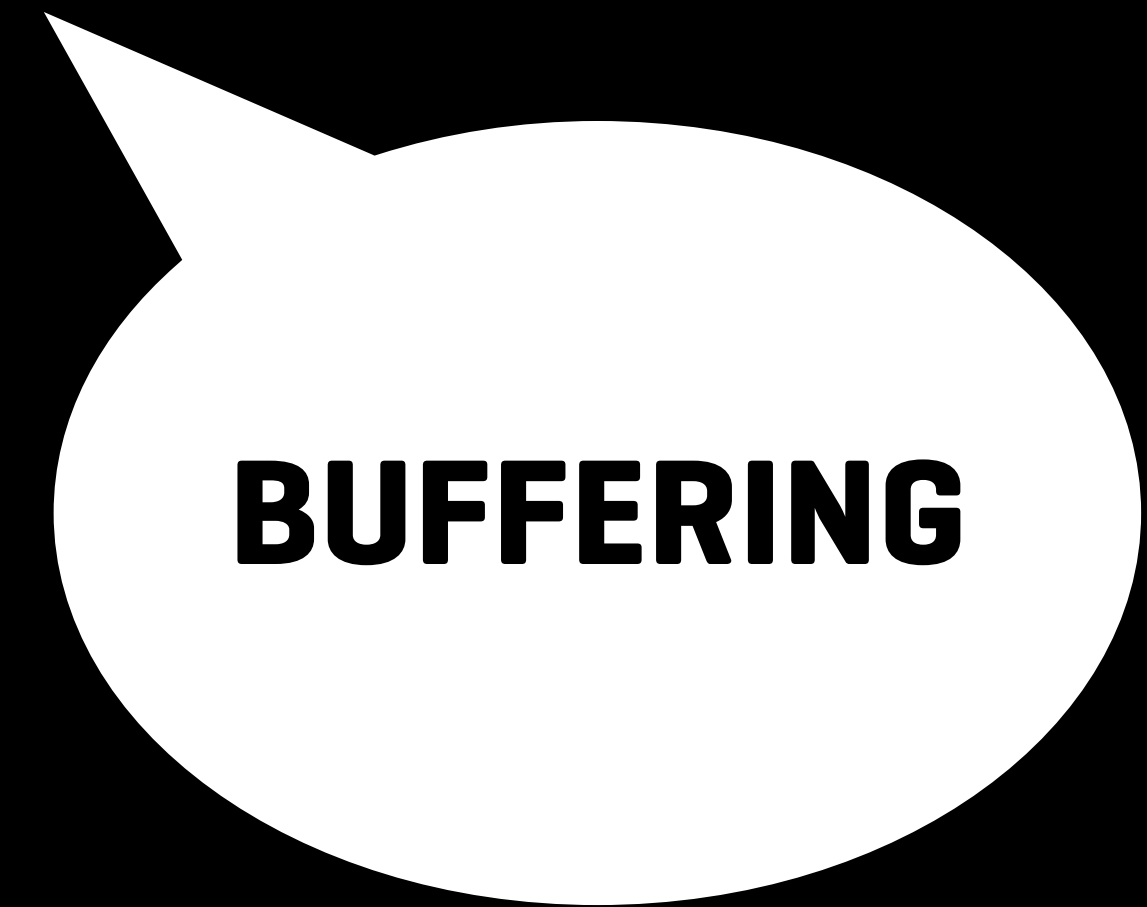
HTTP/1.1 200 OK  
Transfer-Encoding: chunked

Chunk 1  
Chunk 2  
Chunk 3



HTTP/1.1 200 OK  
Content-Length: 27

Chunk 1  
Chunk 2  
Chunk 3



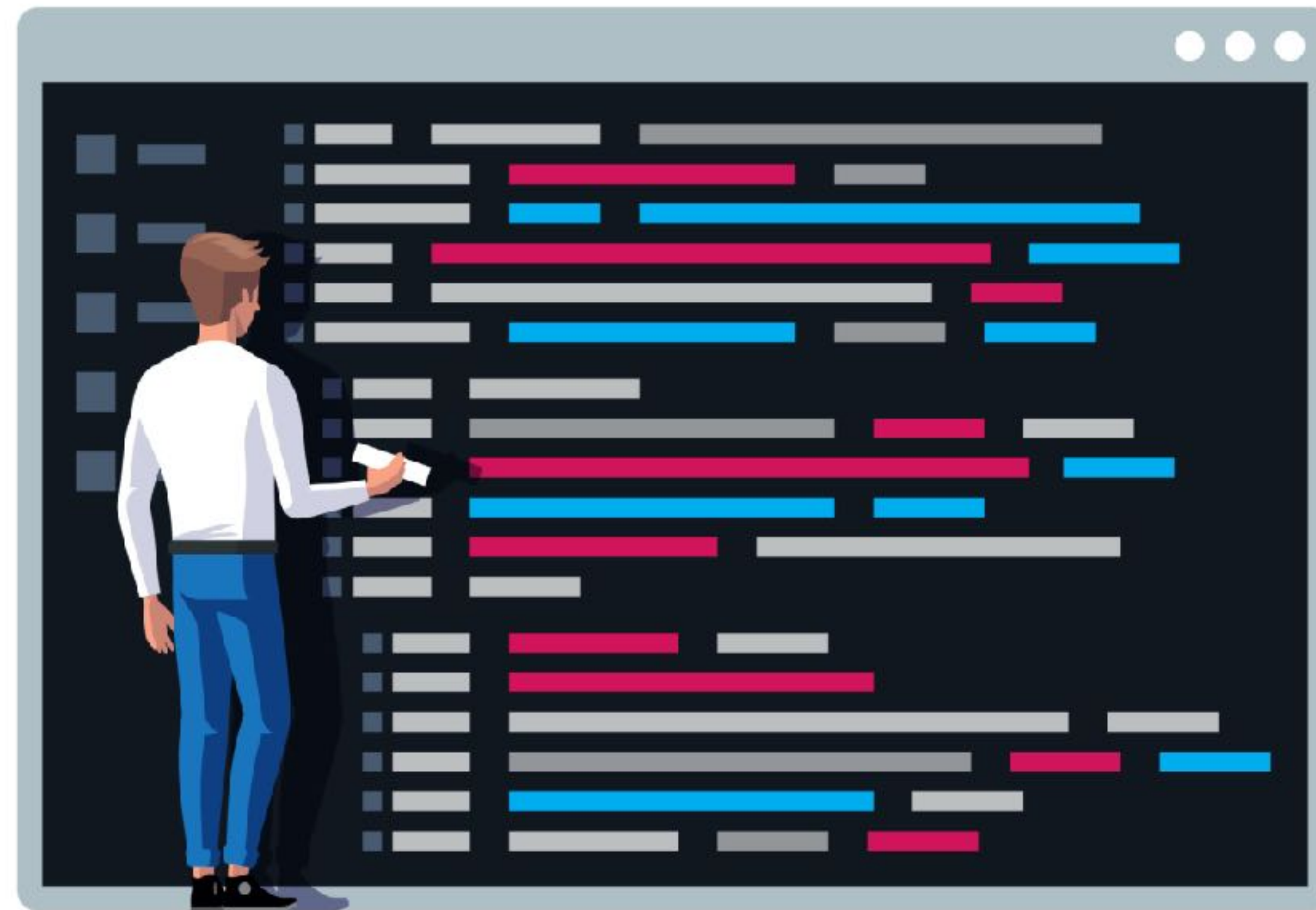


**STREAMING**



**BUFFERING**

# ***VARNISH CONFIGURATION LANGUAGE***



# ***DECISION MAKING AT THE EDGE***



# ***GEO-BASED CONTENT MANIPULATION***

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-TARGETDURATION:6
#EXT-X-MEDIA-SEQUENCE:0
#EXT-X-PLAYLIST-TYPE:VOD
#EXTINF:6.000000,
stream_00_{{country}}.ts
#EXTINF:6.000000,
stream_01.ts
#EXTINF:6.000000,
stream_02.ts
#EXTINF:6.000000,
stream_03.ts
#EXTINF:6.000000,
stream_04.ts
#EXTINF:6.000000,
stream_05.ts
#EXTINF:6.000000,
stream_06.ts
#EXTINF:6.000000,
stream_07.ts
#EXTINF:6.000000,
stream_08.ts
#EXTINF:6.000000,
stream_09.ts
#EXTINF:5.280000,
stream_010.ts
#EXT-X-ENDLIST
```



**INJECT  
COUNTRY-  
SPECIFIC AD**



**STREAM.M3U8**

```
sub vcl_backend_response
{
  if (bereq.url ~ "\.m3u8$") {
    edgestash.parse_response();
    set beresp.ttl = 1s;
  }
}

sub vcl_deliver {
  if (edgestash.is_edgestash()) {
    edgestash.add_json({
      {
        "country": ""} + geodb.country_code(client.ip) + {"
    });
    edgestash.execute();
  }
}
```



**INJECT  
COUNTRY  
CODE**



```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-TARGETDURATION:6
#EXT-X-MEDIA-SEQUENCE:0
#EXT-X-PLAYLIST-TYPE:VOD
#EXTINF:6.000000,
stream_00_n1.ts
#EXTINF:6.000000,
stream_01.ts
#EXTINF:6.000000,
stream_02.ts
#EXTINF:6.000000,
stream_03.ts
#EXTINF:6.000000,
stream_04.ts
#EXTINF:6.000000,
stream_05.ts
#EXTINF:6.000000,
stream_06.ts
#EXTINF:6.000000,
stream_07.ts
#EXTINF:6.000000,
stream_08.ts
#EXTINF:6.000000,
stream_09.ts
#EXTINF:5.280000,
stream_010.ts
#EXT-X-ENDLIST
```

# ***VIDEO SEGMENT PREFETCHING***

```
vcl 4.1;
```

```
import http;
```

```
backend default {  
    .host = "origin";  
    .port = "80";  
}
```

```
sub vcl_recv {  
    if (req.url ~ "^/vod/.\.ts$") {  
        http.init(0);  
        http.req_set_max_loops(0,1);  
        http.req_copy_headers(0);  
        http.req_set_method(0, "HEAD");  
        set req.http.x-next-url = http.prefetch_next_url();  
        http.req_set_url(0, req.http.x-next-url);  
        http.req_send_and_finish(0);  
    }  
}
```

# ***MASSIVE STORAGE ENGINE***



# ***MASSIVE STORAGE ENGINE***

- ✓ **MIX OF MEMORY AND DISK**
- ✓ **SMARTER LRU**
- ✓ **PRE-ALLOCATED LARGE FILES ON DISK**
- ✓ **LESS DISK FRAGMENTATION**
- ✓ **INTELLIGENT STORAGE ROUTING**

```
env: {
  id = "myenv";
  memcache_size = "100G";

  books = ( {
    id = "book1";
    directory = "/var/lib/mse/book1";
    database_size = "1G";
    stores = ( {
      id = "store-1-1";
      filename = "/var/lib/mse/stores/disk1/store-1-1.dat";
      size = "2T";
      tags = ( "slow", "sata" );
    }, {
      tags = ( "fast", "ssd" );
      id = "store-1-2";
      filename = "/var/lib/mse/stores/disk2/store-1-2.dat";
      size = "500G";
    } );
  });
  default_stores = "none";
};
```



**MSE.CONF**

```
vcl 4.1;
```

```
import mse;
```

```
sub vcl_backend_response {  
    if (beresp.ttl < 120s) {  
        mse.set_stores("none");  
    } else {  
        if (beresp.http.Transfer-Encoding ~ "chunked" ||  
beresp.http.Content-Length > 1M) {  
            mse.set_stores("sata");  
        } else {  
            mse.set_stores("fast");  
        }  
    }  
}
```

A close-up photograph of a person's hand pulling the white plastic flush valve handle of a toilet. The toilet bowl is visible in the background, and a white circular button is on the toilet tank lid. A white horizontal bar is overlaid across the middle of the image, containing the text 'PURGING THE CACHE' in bold, italicized black letters.

# ***PURGING THE CACHE***



# KEY-BASED INVALIDATION

```
HTTP/1.1 200 OK  
Cache-Control: s-maxage=3600  
Ykey: hello, article  
  
Hello world
```



**ATTACH  
KEYS TO  
CONTENT**

```
import ykey;
acl purge {
    "localhost";
    "192.168.55.0"/24;
}

sub vcl_recv {
    if (req.method == "PURGE") {
        if (client.ip !~ purge) {
            return (synth(403, "Forbidden"));
        }
        if (req.http.Ykey-Purge) {
            set req.http.n-gone = ykey.purge_header(req.http.Ykey-Purge);
            return (synth(200, "Invalidated "+req.http.n-gone+" objects"));
        } else {
            return (purge);
        }
    }
}

sub vcl_backend_response {
    ykey.add_header(beresp.http.Ykey, sep=", ");
    if (bereq.url ~ "^/content/image/") {
        ykey.add_key("image");
    }
}
```



**KEY-BASED  
INVALIDATION**



**ATTACH  
KEYS TO  
CONTENT**

# KEY-BASED INVALIDATION

```
CURL -XPURGE https://example.com/vod/index.m3u8  
CURL -XPURGE -H "Ykey-Purge: article" https://example.com  
CURL -XPURGE -H "Ykey-Purge: image" https://example.com
```



**INVALIDATE**



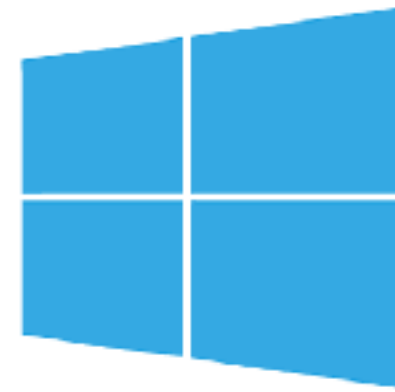


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SOFTWARE

# ***THE VMOD ECOSYSTEM***

***[HTTPS://VARNISH-CACHE.ORG/VMODS/](https://varnish-cache.org/vmods/)***

***[HTTPS://DOCS.VARNISH-SOFTWARE.COM/VARNISH-CACHE-PLUS/VMODS/](https://docs.varnish-software.com/varnish-cache-plus/vmods/)***



Microsoft  
Azure



Google Cloud

FROM \$0.20/H + 14 DAYS FREE TRIAL

THE END





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Compliments of  
**VARNISH**  
SOFTWARE



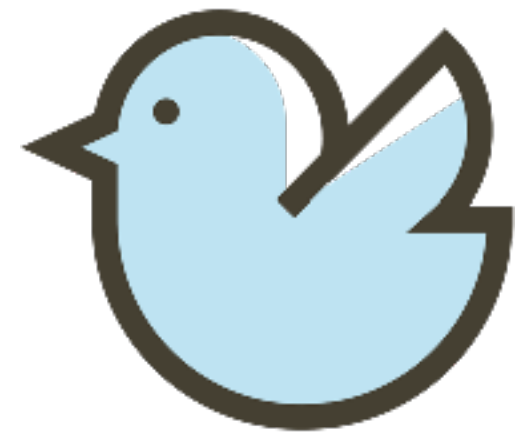
# Getting Started with Varnish Cache

ACCELERATE YOUR WEB APPLICATIONS

Thijs Feryn



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