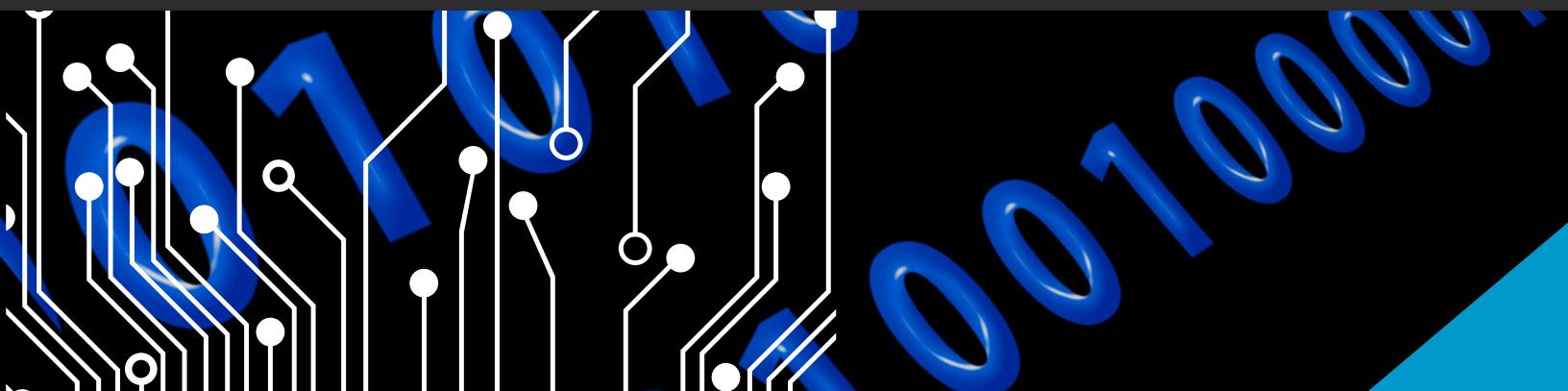




Michael Hayes

INTROSPECTIVE DOCUMENTATION & CODING



Michael Hayes

INTRODUCTION

- Azure solutions architect at Media3
- More than a decade of CF Development
- Cut my teeth with REST API's



OVERVIEW

■ **Introduction**

■ **Introspection**

■ **Metadata**

■ **Examples/Use Cases**

■ **Reading Metadata**

■ **Visualizing Metadata**

■ **Dynamic Programming**

■ **Origin of concept**

■ **Tips and tricks**

■ **Putting it to use**



WHAT IS INTROSPECTION?

- The ability to find out information about an object at runtime
- Inspecting types, properties, classes, methods, and modules

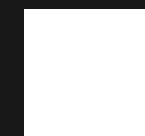


WHAT IS METADATA

- Metadata is data about data.
- It helps organize, find, and understand data.
- Provides description and context for better comprehension.
- Makes tracking and working with specific data easier.



EXAMPLE: HEADERS



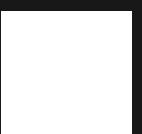
HTTP Headers



Content-Length:
Content-Type:
Date:
Server:
Set-Cookie:

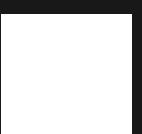
X-Powered-By:

EXAMPLE: OPENID



HTTP Headers

Content-Length:	14840
Content-Type:	text/html; charset=UTF-8
Date:	Fri, 27 Sep 2024 22:00:36 GMT
Server:	Microsoft-IIS/10.0
Set-Cookie:	CGLOBALS=utoken%3D%10%23%3D%7B%20%272024%0D%09%20%2706%A0%62%7C%23f0oken%3D%20%212054 22:00:37 GMT; Path=/; HttpOnly
X-Powered-By:	ASP.NET

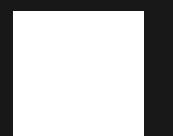


OpenID / OIDC (OAuth2.0)

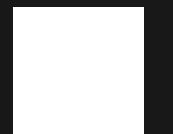
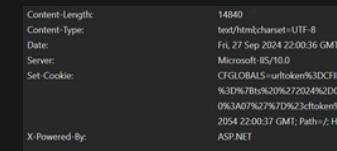


```
1 {  
2     "token_endpoint": "https://login.microsoftonline.com/common/oauth2/v2.0/token",  
3     "token_endpoint_auth_methods_supported": [  
4         "client_secret_post",  
5         "private_key_jwt",  
6         "client_secret_basic"  
7     ],  
8     "jwks_uri": "https://login.microsoftonline.com/common/discovery/v2.0/keys",  
9     "response_modes_supported": [  
10        "query",  
11        "fragment",  
12        "form_post"  
13    ],  
14     "subject_types_supported": [  
15        "pairwise"  
16    ],  
17     "id_token_signing_alg_values_supported": [  
18        "RS256"  
19    ],  
20     "response_types_supported": [  
21        "code",  
22        "id_token",  
23        "code id_token",  
24        "id_token token"  
25    ],  
26     "scopes_supported": [  
27        "openid",  
28        "profile",  
29        "email",  
30        "offline_access"  
31    ],  
32     "issuer": "https://login.microsoftonline.com/{tenantid}/v2.0",  
33     "request_uri_parameter_supported": false,  
34     "userinfo_endpoint": "https://graph.microsoft.com/oidc/userinfo",  
35     "authorization_endpoint": "https://login.microsoftonline.com/common/oauth2/v2.0/authorize",  
36     "device_authorization_endpoint": "https://login.microsoftonline.com/common/oauth2/v2.0/devicecode",  
37     "http_logout_supported": true,  
38     "frontchannel_logout_supported": true,  
39     "end_session_endpoint": "https://login.microsoftonline.com/common/oauth2/v2.0/logout",  
40     "claims_supported": [  
41        "sub",  
42        "iss",  
43        "cloud_instance_name",  
44        "cloud_instance_host_name",  
45        "cloud_graph_host_name",  
46        "msgraph_host",  
47        "aud",  
48        "exp",  
49        "iat",  
50        "auth_time",  
51        "acr",  
52        "nonce",  
53        "preferred_username",  
54        "name",  
55        "tid",  
56        "ver",  
57        "at_hash",  
58        "c_hash",  
59        "email"  
60    ],  
61     "kerberos_endpoint": "https://login.microsoftonline.com/common/kerberos",  
62     "tenant_region_scope": null,  
63     "cloud_instance_name": "microsoftonline.com",  
64     "cloud_graph_host_name": "graph.windows.net",  
65     "msgraph_host": "graph.microsoft.com",  
66     "rbac_url": "https://pas.windows.net"  
67 }
```

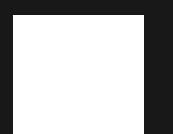
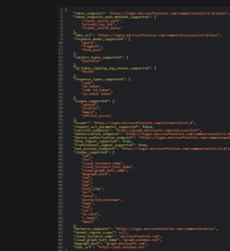
EXAMPLE: JWT



HTTP Headers



OpenID / OIDC (OAuth2.0)

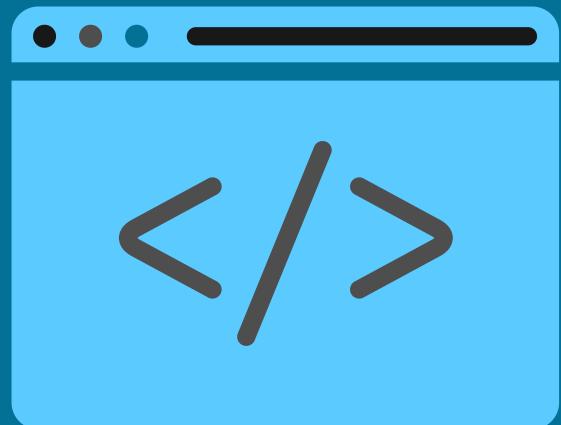


JWT Tokens

Decoded Token Claims

```
{
  "typ": "JWT",
  "nonce": "drf11uyoJJZSc4K8RZkUuTDsleiJVTcglW4SKEs1Palg",
  "alg": "RS256",
  "x5t": "Mc7l3Iz93g7uwgNeEmmw_WYGPko",
  "kid": "Mc7l3Iz93g7uwgNeEmmw_WYGPko"
}.{
  "aud": "00000003-0000-0000-c000-000000000000",
  "iss": "https://sts.windows.net/4bd1d0b7-977d-40b2-84f1-39a01eb49ad0/",
  "iat": 1727474611,
  "nbf": 1727474611,
  "exp": 1727561311,
  "acct": 0,
  "acr": "1",
  "aio": "AVQAq/8YAAAAOJbdGXDEvoLQ17mz7Dk0pHVNoXIrF5p/iQNbMhe8yks2mofJHUuHcpEzmBk0mLP9Smn0r4AeFmj0pnufZCSicPJ/zuFzR1z4L0eSkFXMBgI=",
  "amr": [
    "pwd",
    "mfa"
  ],
  "app_displayname": "Graph Explorer",
  "appid": "de8bc8b5-d9f9-48b1-a8ad-b748da725064",
  "appidacr": "0",
  "idtyp": "user",
  "ipaddr": "75.67.26.203",
  "name": "CFDemo",
  "oid": "2e1f2cf1-2b28-4682-a05a-b4f004d2de2a",
  "platf": "3",
  "puid": "100320037246DCBF",
  "rh": "0.AUUAt9DRS32XskCE8TmgHrSa0AMAAAAAAAABFAVo.",
  "scp": "APIConnectors.Read.All APIConnectors.ReadWrite.All Application.ReadWrite.All Directory.ReadWrite.All openid profile User.Read email",
  "sub": "PS_KqNyU1-5ApdAq8hsc0Ce-ZyYZA4hQVr5eahgB2VY",
  "tenant_region_scope": "NA",
```

READING METADATA



Functions

- `GetMetaData();`
- `GetApplicationMetaData();`
- `StructGetMetaData({});`
- `GetSessionMetaData();`
- `callStackGet();`
- `getHttpRequestData();`
- `GetPageContext();`
- `uploadMetadata(parameterStruct)` (this is for blob api)
- `ImageGetEXIFMetadata();`
- `ImageInfo();`
- `ImageGetMetaData();`

Scopes / Objects

- Server Scope
- Environment Scope
- Headers

DYNAMIC PROGRAMMING

- **Array notation vs. dot notation**
- **Data manipulation functions**
 - **StructKeyArray()**
 - **ValueList()**
 - **QueryExecute (returnType="array")**

```
1 <cfscript>
2     MyObject = {
3         "id": 42,
4         "id ": 42,
5         "name": "John Doe",
6         "email": "JohnDoe@example.com",
7         "Complex Key Name - 123" : "My Value"
8     }
9     // Dot notation syntax
10    WriteOutput( MyObject.id & "<br>" );
11
12
13    // Dot notation Syntax
14    WriteOutput( MyObject['Complex Key Name - 123'] & "<br>" );
```

WHAT IS INTROSPECTIVE DOCUMENTATION?

- A method to dynamically create documentation from existing code.
- Ensure code is written consistently.
- Speed up development by utilizing building blocks rather rewriting code over and over.



WHERE IT THRIVES

- Complex method signatures
- Quick testing
- Research and development
- Exploring unfamiliar code



WHO ITS FOR

- Any skill range of developer
 - Beginner: Get your feet wet
 - Intermediate: Save code snippets
 - Advanced: Admin tasks & automation
 - Expert: Custom tools
- If you write with components
- If you work with Web based / REST APIs



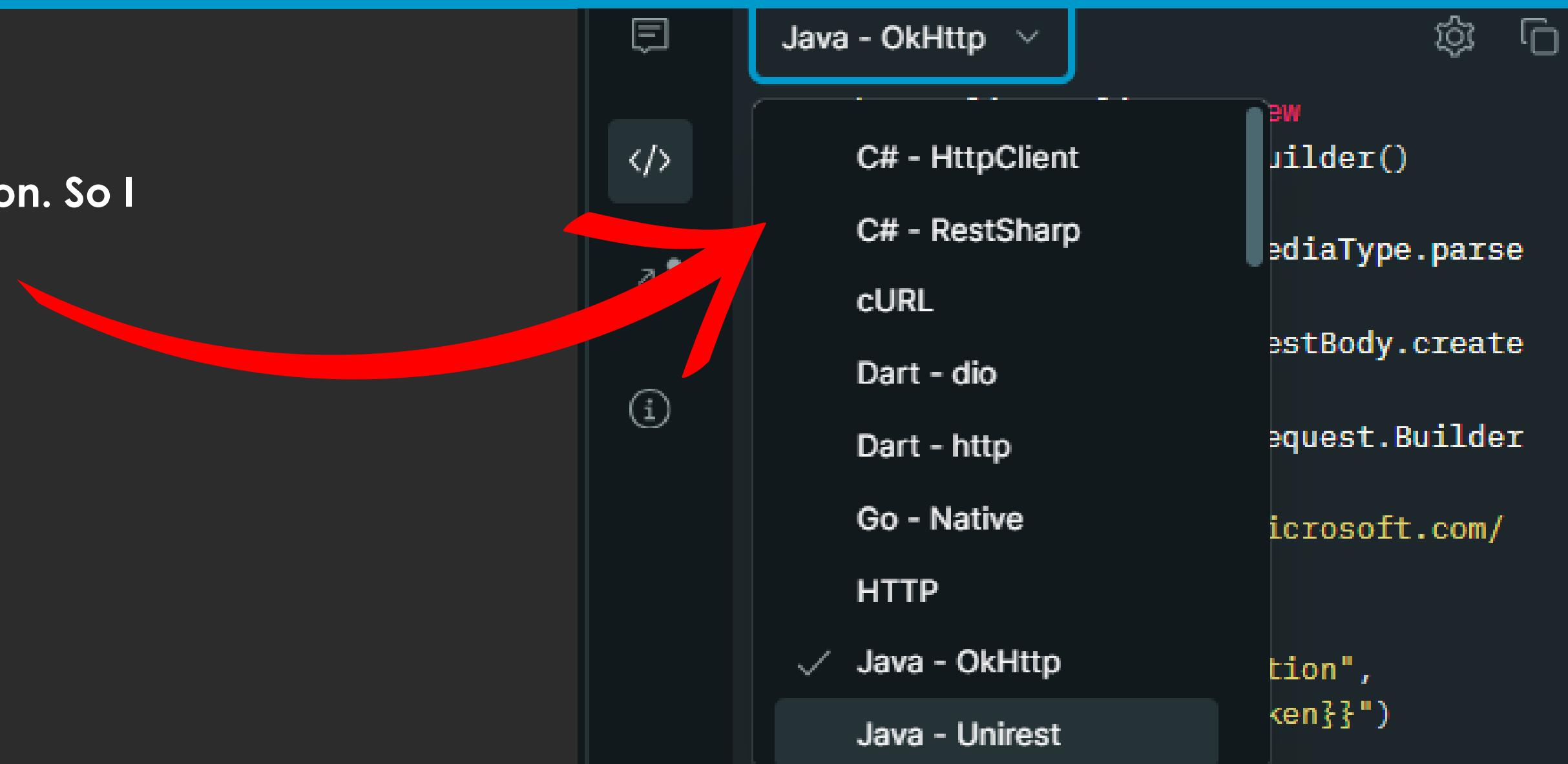
ORIGIN OF CONCEPT

- Extensive experience with REST APIs
 - Discovered Postman early on
- Learned that code snippets and reverse engineering save significant time



WHERE IS MY CF!?!?!

There are many options, yet no ColdFusion. So I always wanted my own version.



TIPS AND TRICKS

- Component.cfc File
 - All CFCs extend this file: WEB-INF/cftags/component.cfc
 - Used for core methods or properties inherited by all CFCs in a ColdFusion application.
- Visualizing Metadata
- Creating Schemas
- Validating Schemas



IN SUMMARY

Introspective Documentation and Coding

- **Code snippets and documentation for existing code**
- **Utilizes dynamic coding practices**
- **The more descriptive your code is the better the documentation will be.**



Michael Hayes

CONTACT / SOCIAL



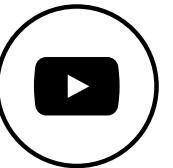
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[@Coding-With-Mike](#)