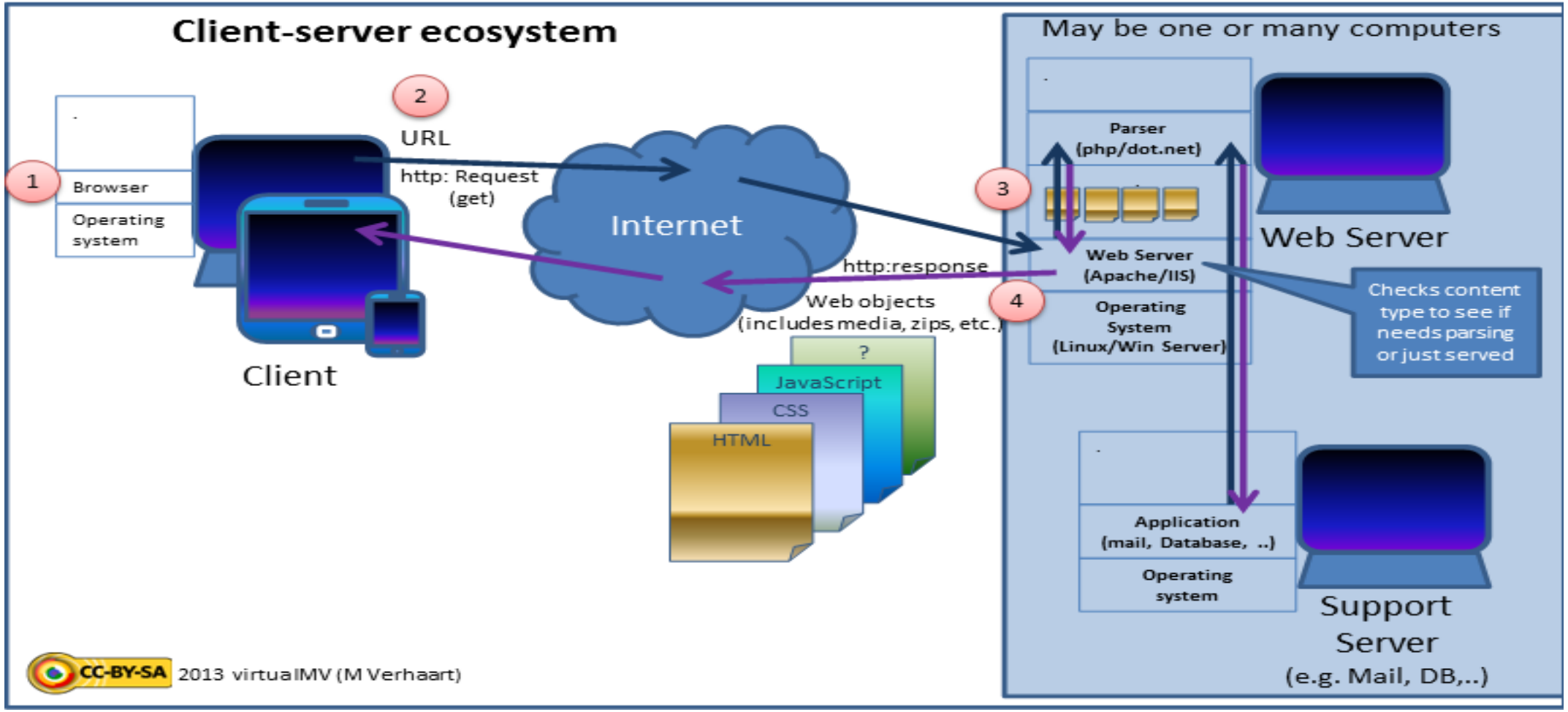
PROJECT TRAINING WORKSHOP

Web API Fundamentals

UNDERSTANDING CLIENT/SERVER

UNDERSTANDING CLIENT/SERVER



UNDERSTANDING OSI Model

Layer 7: Application

Preparing requests
Protocols: HTTP, HTTPS, DNS
Data: Requests

Layer 5: Session

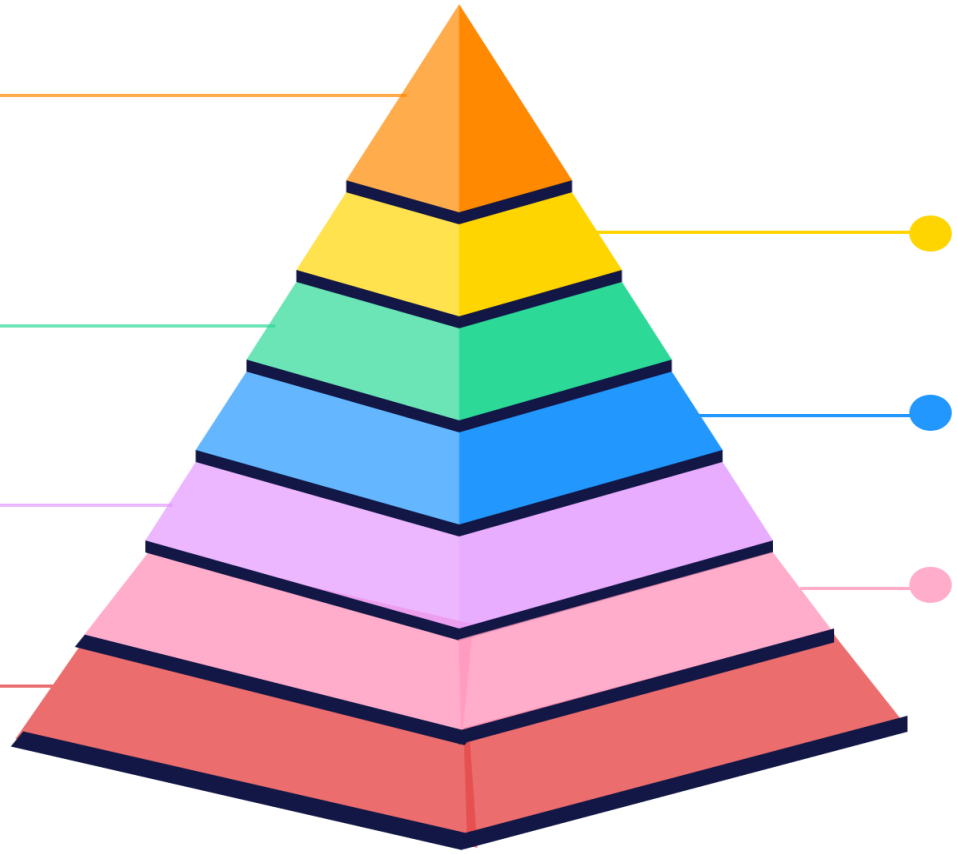
Creating communication channels (sessions) between devices
Protocols: RPC
Data: Requests

Layer 3: Network

Breaks segments into network packets and finds best route for sending packets.
Protocols: IP, NAT, ARP
Data: Packets

Layer 1: Physical

Converts data into physical signals
Data: Optics (Fibre), Electricity



Layer 6: Presentation

Data format
eg. encryption and compression
Protocols: TLS, SSL
Data: Requests

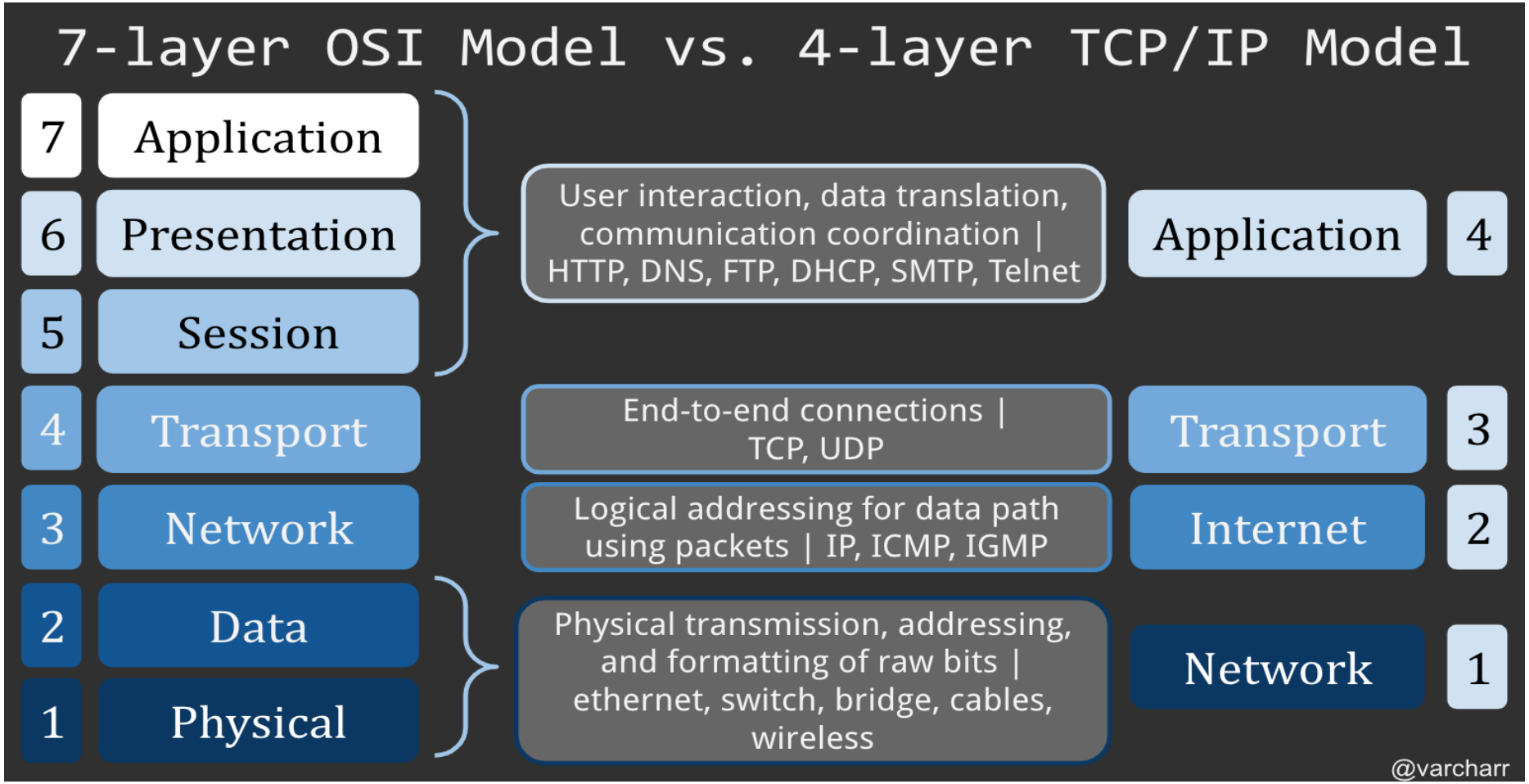
Layer 4: Transport

Breaks requests down into pieces that can be sent over the network and handles the sending of those
Protocols: TCP, UDP
Data: Segments

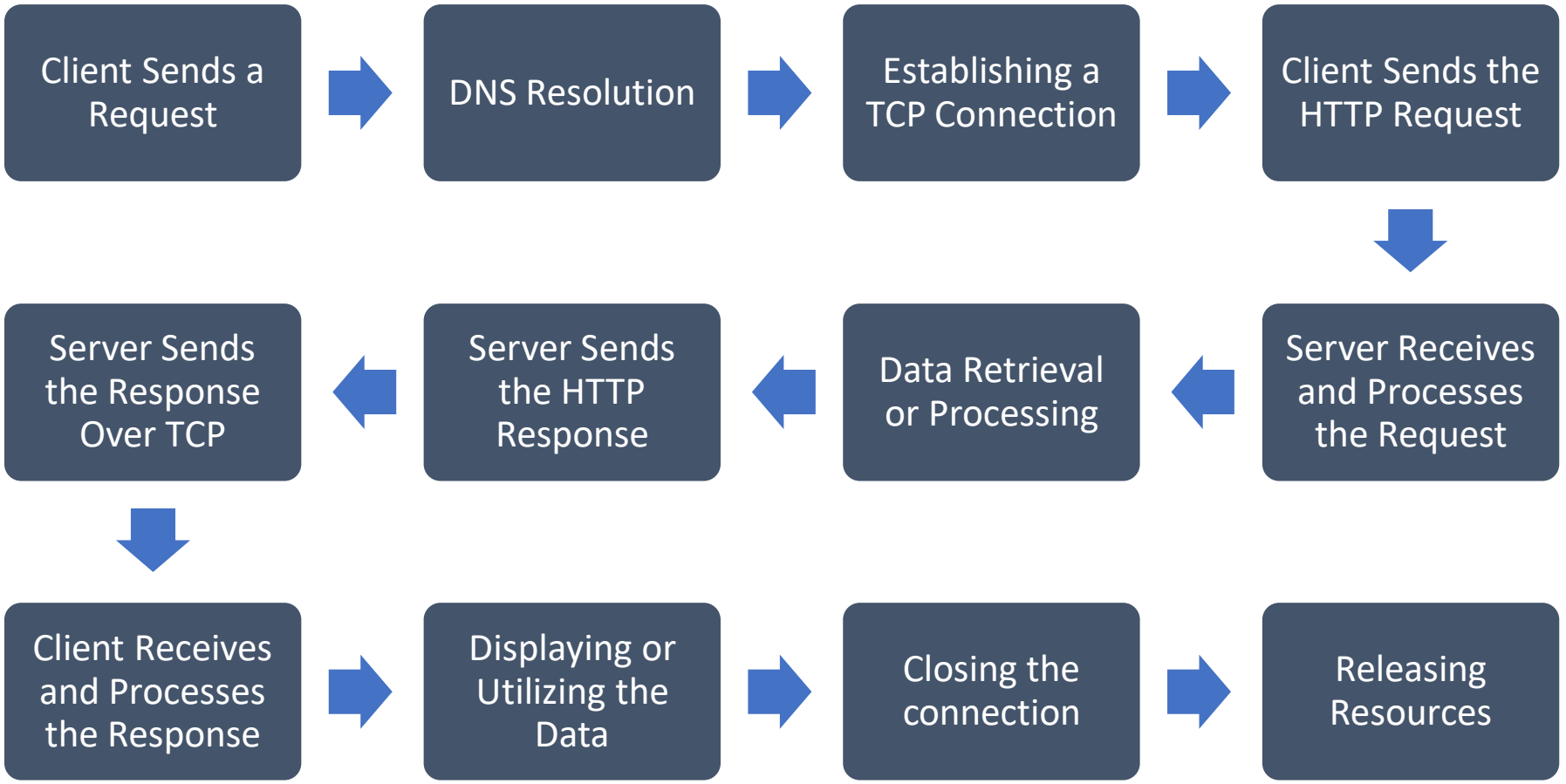
Layer 2: Data Link

Establishes connections between physical machines using MAC addresses
Breaks segments packets into frames and sends from source to destination
Protocols: Wifi, Ethernet
Data: Frames

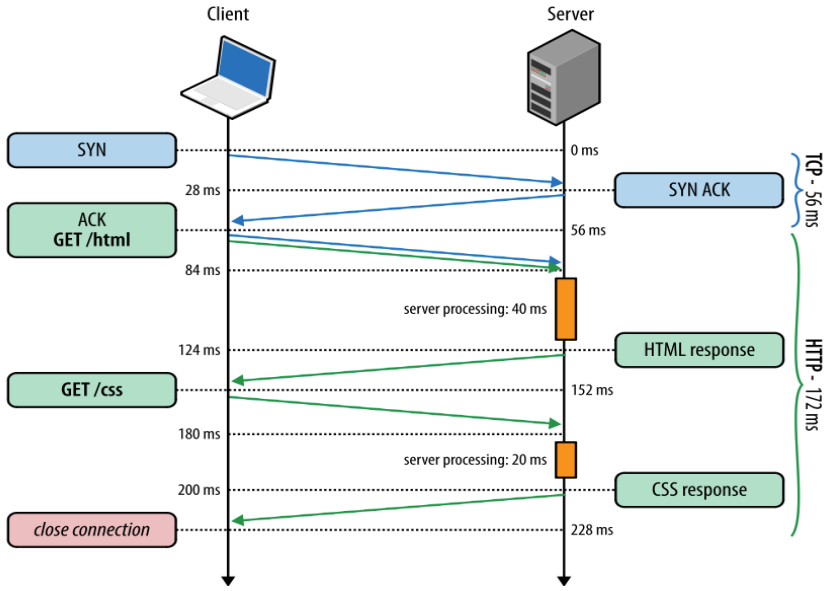
UNDERSTANDING TCP/IP Model

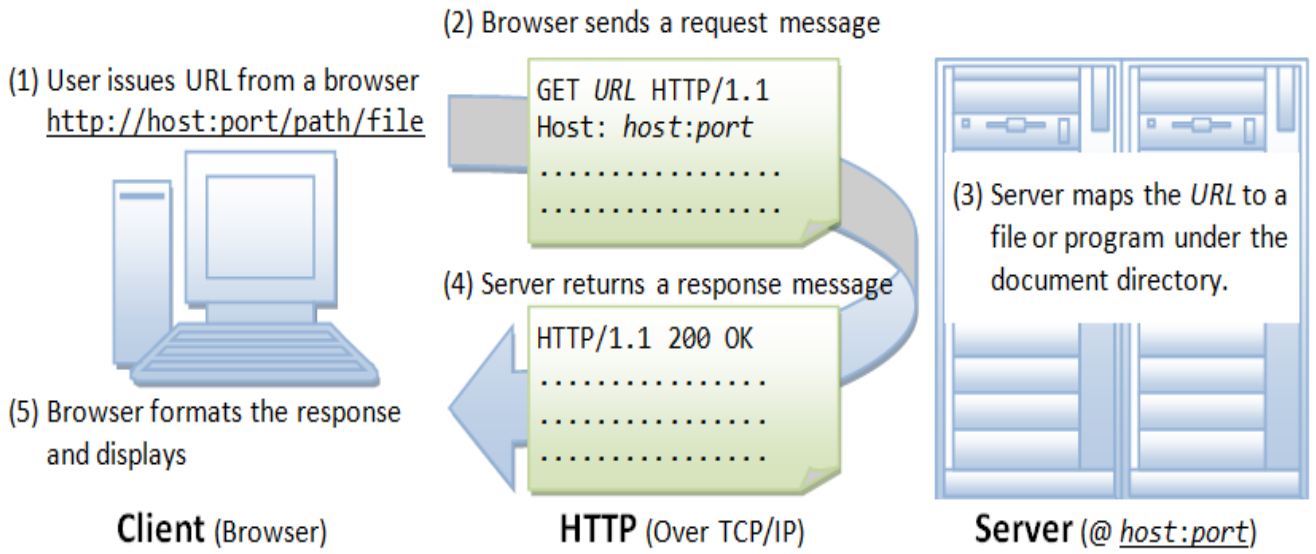


UNDERSTANDING REQUEST/RESPONSE

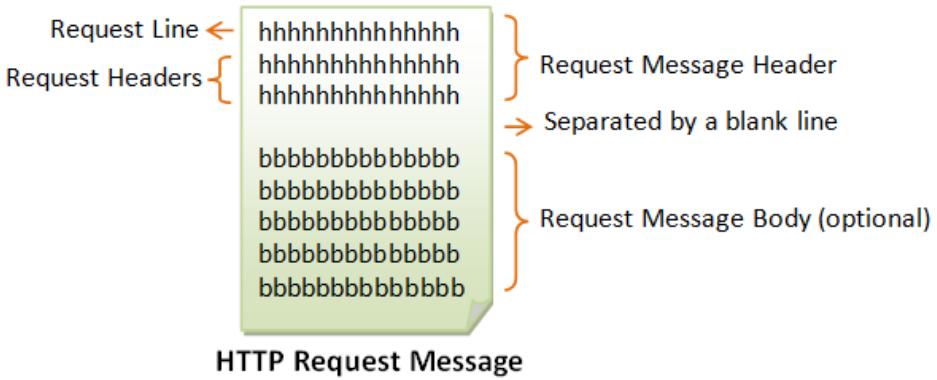


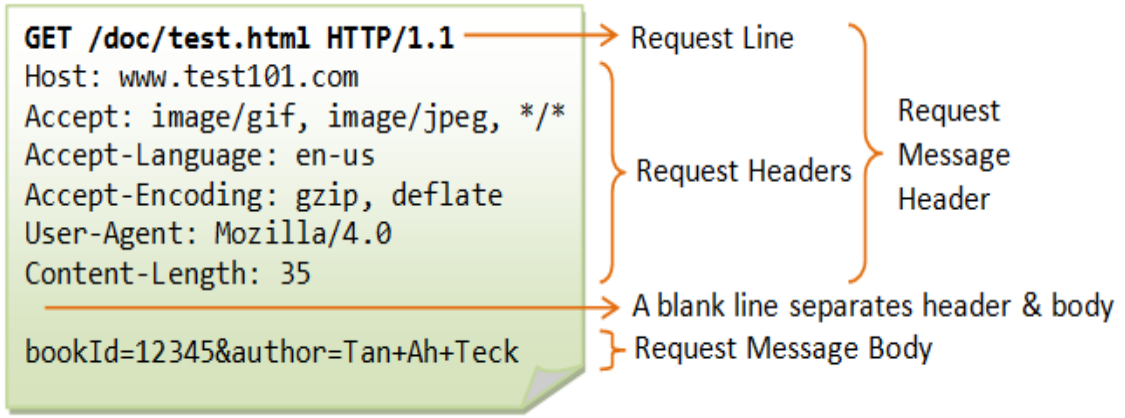
UNDERSTANDING REQUEST/RESPONSE



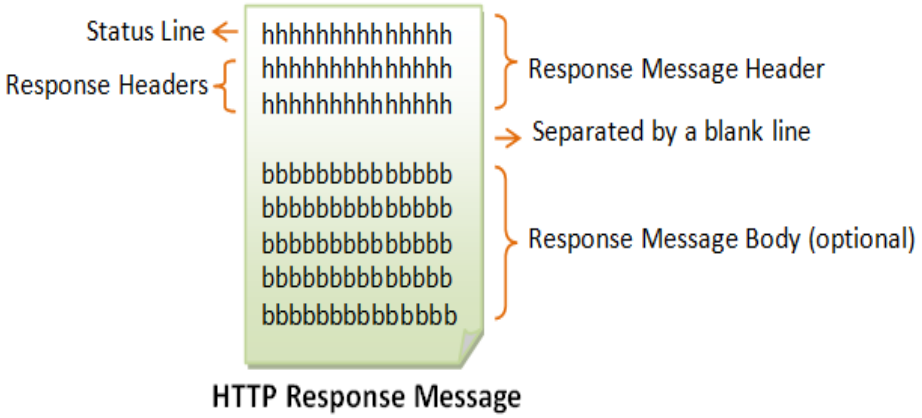


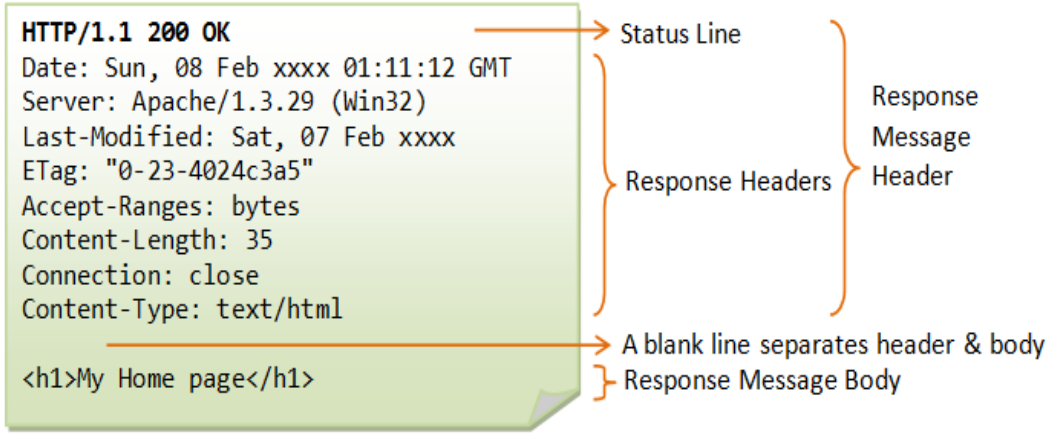
UNDERSTANDING REQUEST





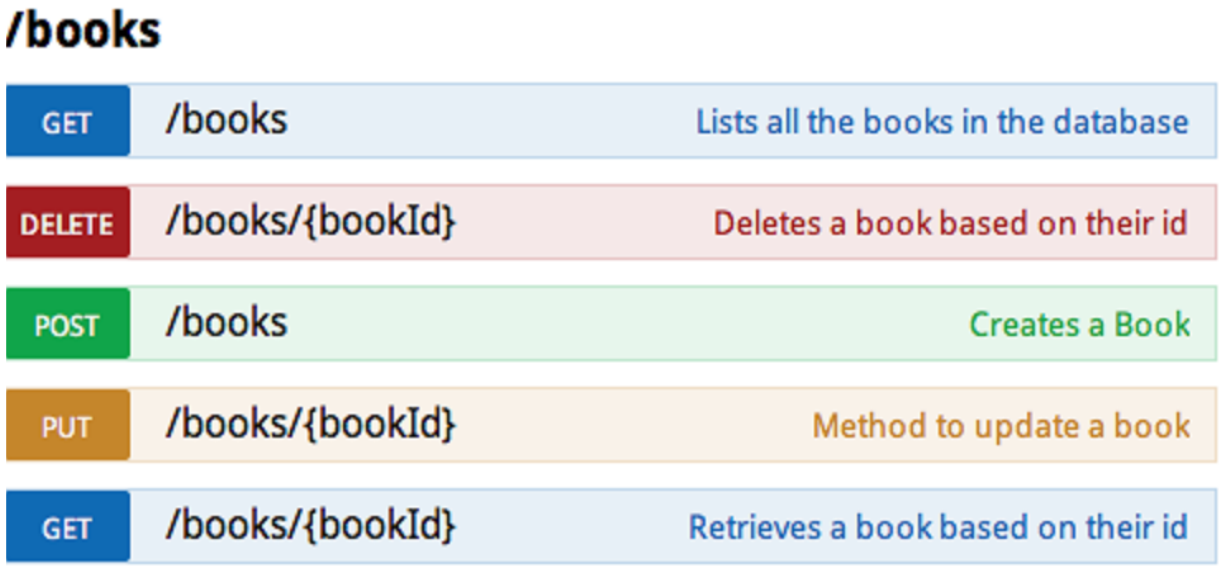
UNDERSTANDING RESPONSE





HTTP METHODS

GET	HEAD	POST	PUT
DELETE	TRACE	OPTIONS	CONNECT
PATCH			



HTTP HEADERS

GENERAL	REQUEST	RESPONSE	ENTITY

```
general-header = Cache-Control          ;
               | Connection             ;
               | Date                   ;
               | Pragma                 ;
               | Trailer                ;
               | Transfer-Encoding      ;
               | Upgrade                ;
               | Via                    ;
               | Warning                ;
```

```
request-header = Accept                 ;
               | Accept-Charset          ;
               | Accept-Encoding         ;
               | Accept-Language         ;
               | Authorization           ;
               | Expect                  ;
               | From                    ;
               | Host                    ;
               | If-Match                ;

               | If-Modified-Since       ;
               | If-None-Match           ;
               | If-Range                ;
               | If-Unmodified-Since     ;
               | Max-Forwards            ;
               | Proxy-Authorization     ;
               | Range                   ;
               | Referer                 ;
               | TE                      ;
               | User-Agent              ;
```

```
response-header = Accept-Ranges         ;
                | Age                    ;
                | ETag                   ;
                | Location               ;
                | Proxy-Authenticate     ;

                | Retry-After            ;
                | Server                 ;
                | Vary                   ;
                | WWW-Authenticate       ;
```

```
entity-header  = Allow                  ;
               | Content-Encoding        ;
               | Content-Language        ;
               | Content-Length          ;
               | Content-Location        ;
               | Content-MD5             ;
               | Content-Range           ;
               | Content-Type            ;
               | Expires                 ;
               | Last-Modified           ;
               | extension-header

extension-header = message-header
```

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HTTP STATUS CODES

https://developer.mozilla.org/en-US/docs/Web/HTTP/Status

1XX - Informational	• It means the request has been received and the process is continuing. • 100-199
2XX - Successful	• It denotes the client's request was successfully received, understood, and accepted. • 200-299
3XX - Redirection	• It means further action need to taken to complete the request. • 300-399
4XX - Client Error	• Invalid request due to incorrect syntax or this request cannot be fulfilled. • 400-499
5XX - Server Error	• Server has failed to fulfill a valid request • 500-599

PROJECT TRAINING WORKSHOP

Authentication and Authorization

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UNDERSTANDING AUTHENTICATION

What is Authentication?

- **The process of verifying the identity of users or systems**

What are the key concepts to know about Authentication?

Authentication Factors (PIN, Password, Token, Bio Metrics)	Password Security (Complexity, Hash, Salt, Policies)	Multi-Factor Authentication (MFA)	OAuth and OpenID Connect

What is Authorization?

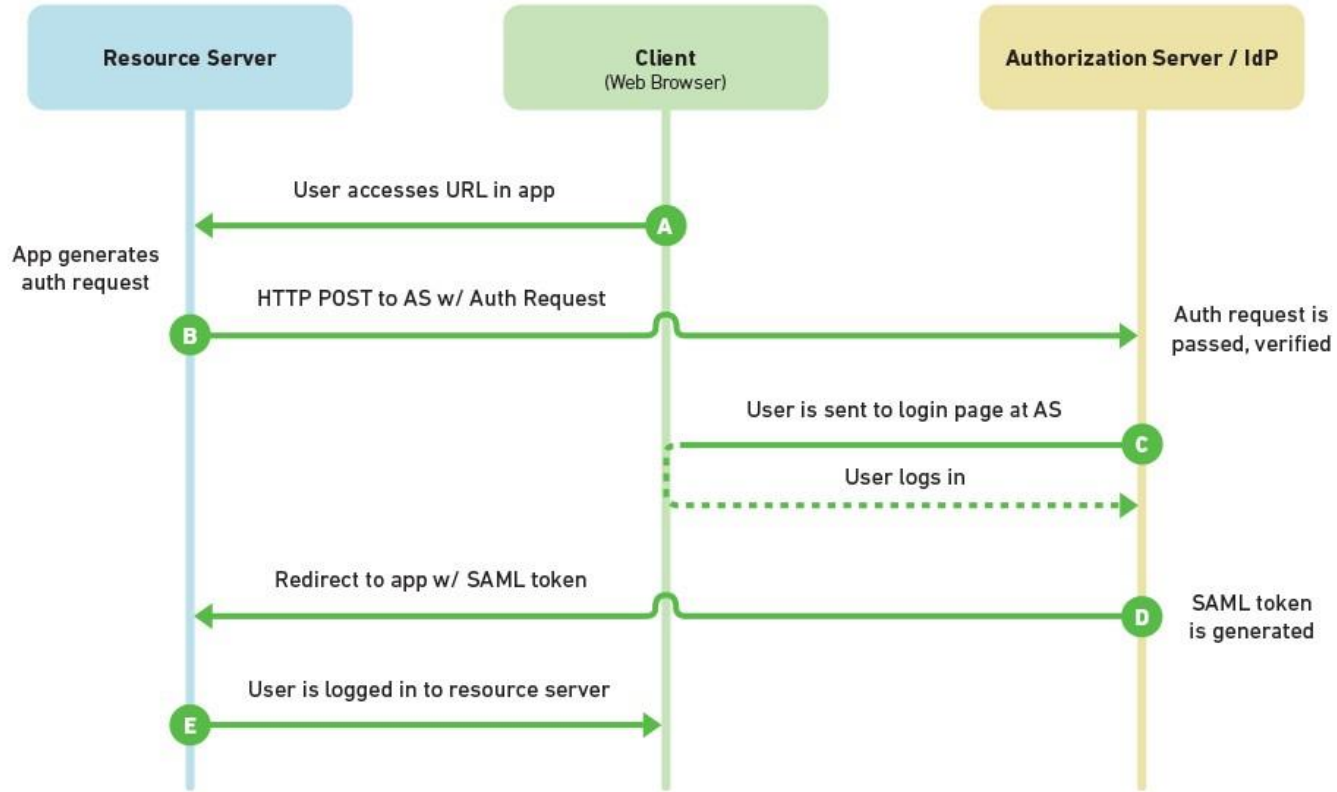
- **The process of determining what actions or resources a user or system is allowed to access**

What are the key concepts to know about Authorization?

Access Control	Role Based Access Control (RBAC) (Admin, User, Support)	Attribute Based Access Control (ABAC) (subject, action, object)	Access Controls Lists (ACLs)
Policy Based Access Control (PBAC)	API Authorization		

UNDERSTANDING SSO - SAML

Security Assertion Markup Language



Assertions includes,

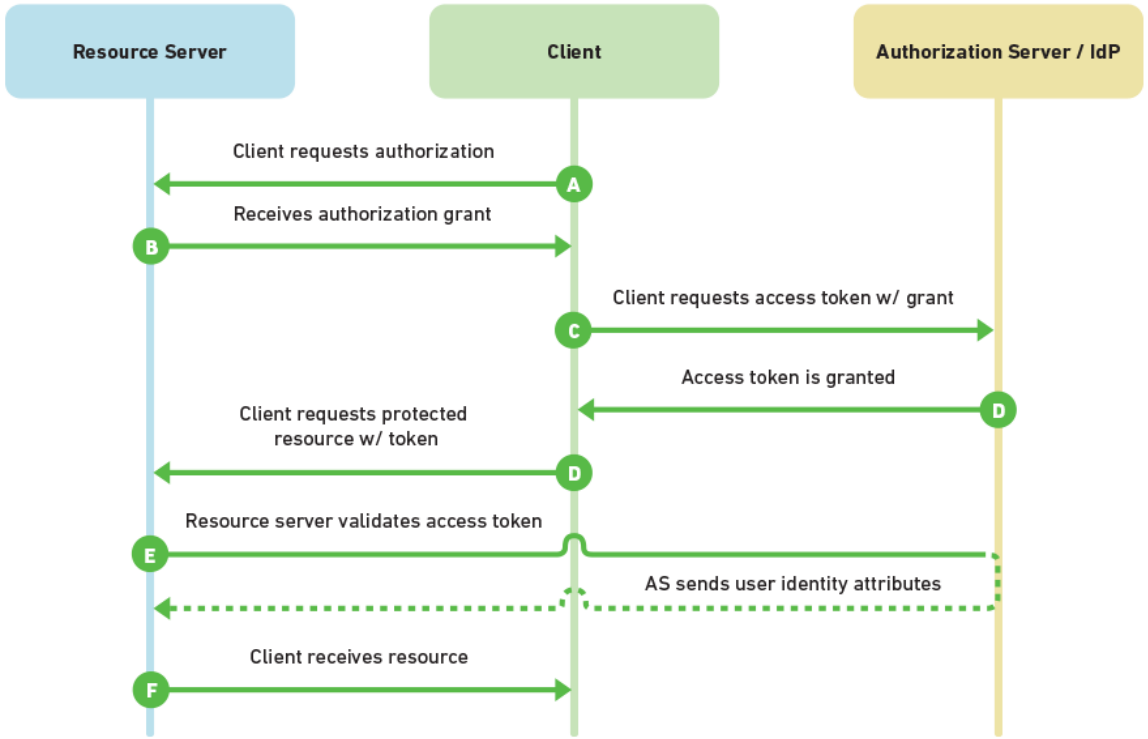
Authentication
- Identification of the user

Attributes
- Information about the user

Authorization
- What user can do and access

UNDERSTANDING SSO – OAUTH 2.0

Open Authentication



Resource Owner
- An entity granting access to a protected resource

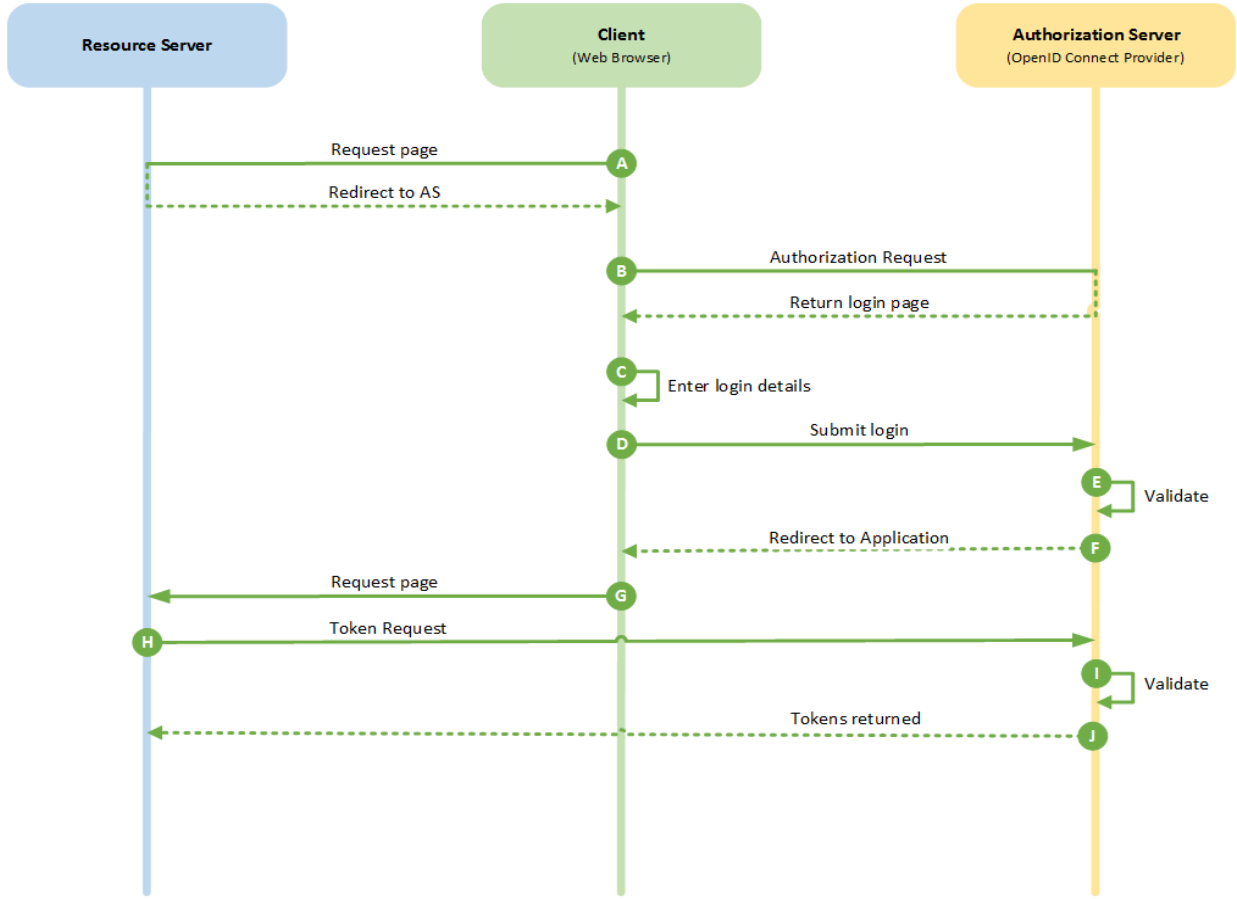
Resource Server
- Server hosting the protected resources

Client
- An application making protected resource requests

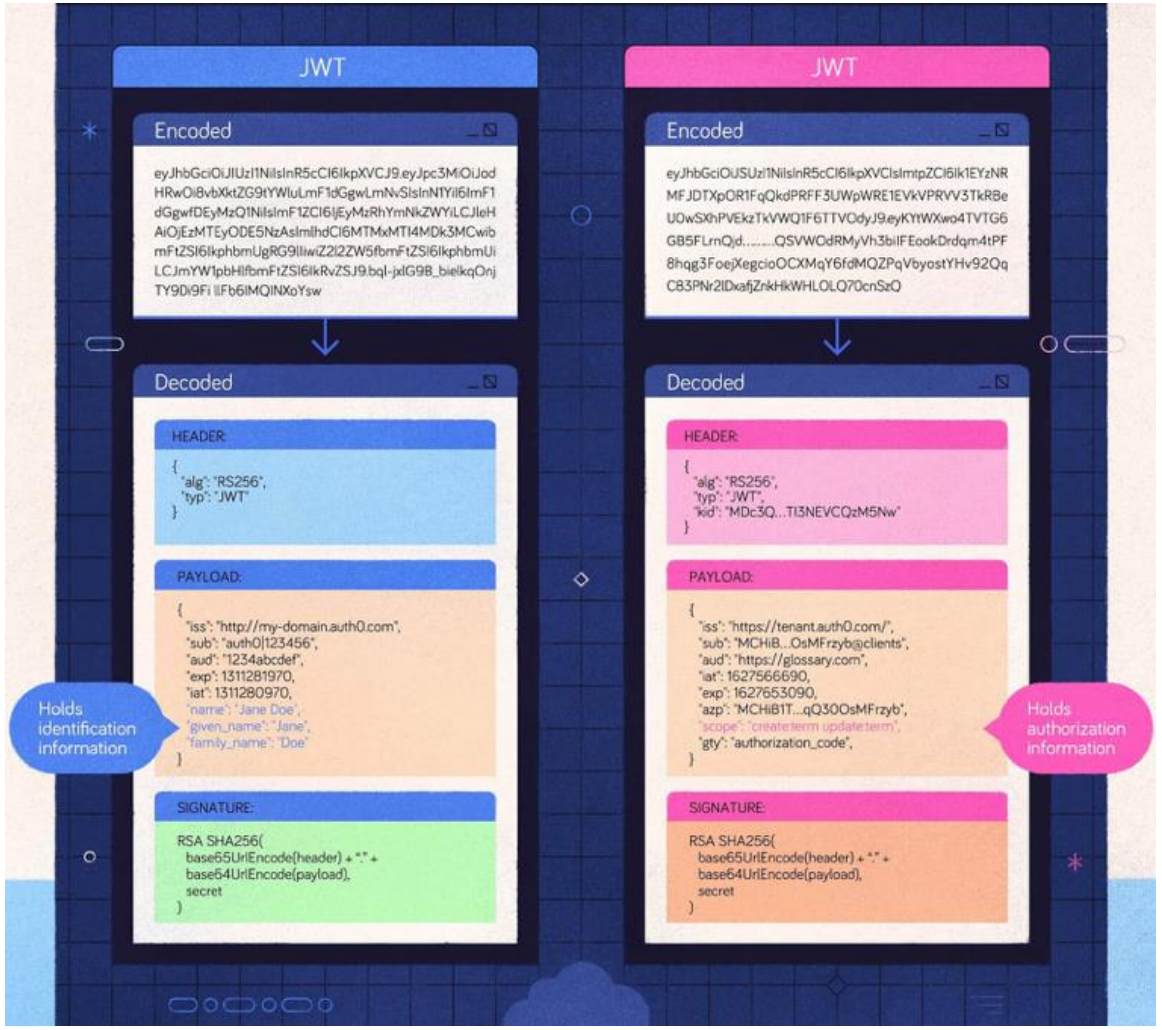
Authorization Server
- Server issuing token

UNDERSTANDING SSO - OIDC

Open ID Connect



UNDERSTANDING TOKENS



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