Web Resources: Representations

➤ A resource my be available in several different representations:

   ▪ Different languages, different encoding, different media types, or a combination.

➤ Different clients may expect/request different representations.

➤ Requesting and serving a specific format of a representation of a resource is called: ***content negotiation***.

What Is Content Negotiation (CN) ?

"HTTP has provisions for several mechanisms for "content negotiation" – the process of selecting the best representation for a given response when there are multiple representations available.

— *RFC 2616, Fielding et al.*

➢ Content negotiation is the process of selecting **one** of multiple possible representations (a.k.a variants) to return to a client:
  ▪ Based on client or server preferences: media type, languages, character set and encoding
  ▪ The choice of representation is intended to be the one best suited for the client

Types of Content Negotiation

➤ Content negotiation determines how a specific representation is chosen when a resource is requested.

➤ There are **two approaches** to content negotiation:
  1 **Proactive** (a.k.a *Server-Driven*) negotiation:
    ❑ The most common method
    ❑ Initiated by the client and is accomplished by including certain HTTP headers with each HTTP request.

  2 **Reactive** (a.k.a Agent/Client-Driven) negotiation:
    ❑ Initiated by the server
    ❑ Server returns a selection page and includes the 300 Multiple Choices status code.
    ❑ The client is responsible for choosing the most suitable resource among the options that are presented.
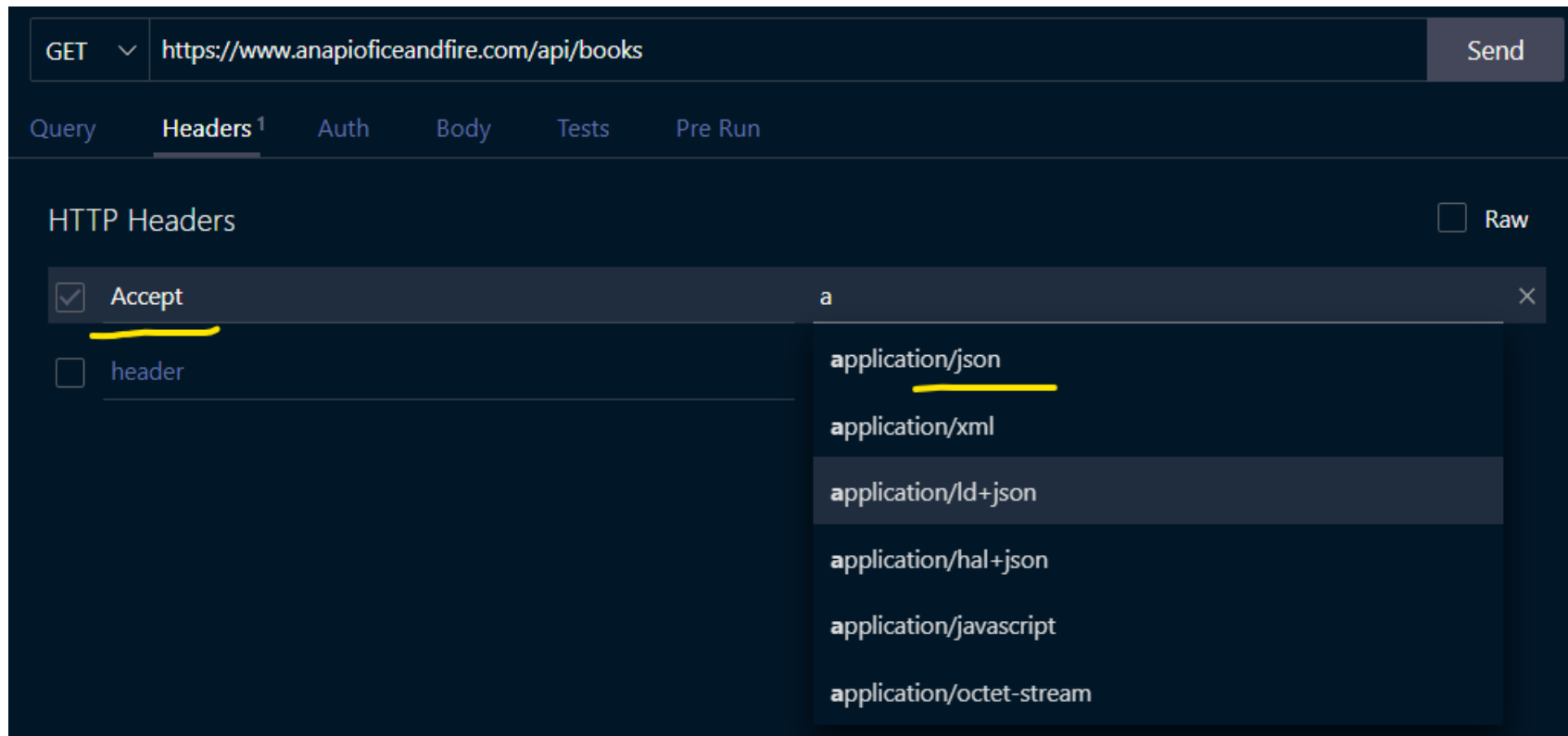
Server-Driver CN: Request Headers

➢ The following are the HTTP **request** headers that a client can include to ask for a specific representation of a resource.

HTTP Header	Purpose	Examples
Accept	Used to indicate the types of **content** that the client can understand.	Accept: \<MIME-type>/\<MIME-subtype> Accept: application/json Accept:*/* Accept: \<MIME-type>/*
Accept-Language	Used to indicate the **language** that the client can understand.	Accept-Language: en-UK, en, de;q=0.5
Accept-Encoding	Used to indicate the types of **content encoding** that the client can understand.	Accept-Encoding: gzip Accept-Encoding: gzip, deflate, br;q=1.0, identity;q=0.5, *;q=0.25

Server-Driver CN: Accept Request Headers

➢ An example of how a client can specify its preferred representation format in the request of a given resource.

Server-Driver CN: HTTP Response Headers

➢ HTTP response headers are part of the content negation process
   ▪ Both for server-driven and agent-driven negotiation

➢ The following are the HTTP **response** headers that the server can include in the response to confirm a successful delivery of the requested type of representation

HTTP Header	Purpose	Examples
Content-Type	Indicates the original **media type** of the resource as specified in the request.	Content-Type: application/json Content-Type: text/html; charset=UTF-8
Content-Encoding	Describes the representation and includes a list of **encodings** that have been applied to the message.	Content-Encoding: deflate, br
Content-Language	Lists the **languages** and corresponding **regions** that the content is intended for.	Content-Language: en-US Content-Language: fr-CA