how do i shot web

ISSS beginner talk

Synopsis

```
CREATE [ [ GLOBAL | LOCAL ] { TEMPORARY | TEMP } | UNLOGGED ] TABLE [ IF NOT EXISTS ] table_name ( [
  { column_name data_type [ COLLATE collation ] [ column_constraint [ ... ] ]
    | table_constraint
    | LIKE parent_table [ like_option ... ] }
    [, ... ]
] )
[ INHERITS ( parent_table [, ... ] ) ]
[ WITH ( storage_parameter [= value] [, ... ] ) | WITH OIDS | WITHOUT OIDS ]
[ ON COMMIT { PRESERVE ROWS | DELETE ROWS | DROP } ]
[ TABLESPACE tablespace ]

CREATE [ [ GLOBAL | LOCAL ] { TEMPORARY | TEMP } | UNLOGGED ] TABLE [ IF NOT EXISTS ] table_name
    OF type_name [ (
  { column_name WITH OPTIONS [ column_constraint [ ... ] ]
    | table_constraint }
    [, ... ]
) ]
[ WITH ( storage_parameter [= value] [, ... ] ) | WITH OIDS | WITHOUT OIDS ]
[ ON COMMIT { PRESERVE ROWS | DELETE ROWS | DROP } ]
[ TABLESPACE tablespace ]

where column_constraint is:

[ CONSTRAINT constraint_name ]
{ NOT NULL |
  NULL |
  CHECK ( expression ) |
  DEFAULT default_expr |
  UNIQUE index_parameters |
  PRIMARY KEY index_parameters |
  REFERENCES reftable [ ( refcolumn ) ] [ MATCH FULL | MATCH PARTIAL | MATCH SIMPLE ]
    [ ON DELETE action ] [ ON UPDATE action ] }
[ DEFERRABLE | NOT DEFERRABLE ] [ INITIALLY DEFERRED | INITIALLY IMMEDIATE ]

and table_constraint is:

[ CONSTRAINT constraint_name ]
{ CHECK ( expression ) |
  UNIQUE ( column_name [, ... ] ) index_parameters |
  PRIMARY KEY ( column_name [, ... ] ) index_parameters |
  EXCLUDE [ USING index_method ] ( exclude_element WITH operator [, ... ] ) index_parameters [ WHERE ( predica
  FOREIGN KEY ( column_name [, ... ] ) REFERENCES reftable [ ( refcolumn [, ... ] ) ]
    [ MATCH FULL | MATCH PARTIAL | MATCH SIMPLE ] [ ON DELETE action ] [ ON UPDATE action ] }
[ DEFERRABLE | NOT DEFERRABLE ] [ INITIALLY DEFERRED | INITIALLY IMMEDIATE ]

and like_option is:

{ INCLUDING | EXCLUDING } { DEFAULTS | CONSTRAINTS | INDEXES | STORAGE | COMMENTS | ALL }

index_parameters in UNIQUE, PRIMARY KEY, and EXCLUDE constraints are:

[ WITH ( storage_parameter [= value] [, ... ] ) ]
[ USING INDEX TABLESPACE tablespace ]

exclude_element in an EXCLUDE constraint is:

{ column | ( expression ) } [ opclass ] [ ASC | DESC ] [ NULLS { FIRST | LAST } ]
```

HTTP Status Codes

This page is created from HTTP status code information found at ietf.org and Wikipedia. Click on the **category heading** or the **status code** link to read more.

1xx Informational

100 Continue
101 Switching Protocols
102 Processing (WebDAV)

2xx Success

★ 200 OK
★ 201 Created
202 Accepted
203 Non-Authoritative Information
★ 204 No Content
205 Reset Content
206 Partial Content
207 Multi-Status (WebDAV)
208 Already Reported (WebDAV)
226 IM Used

3xx Redirection

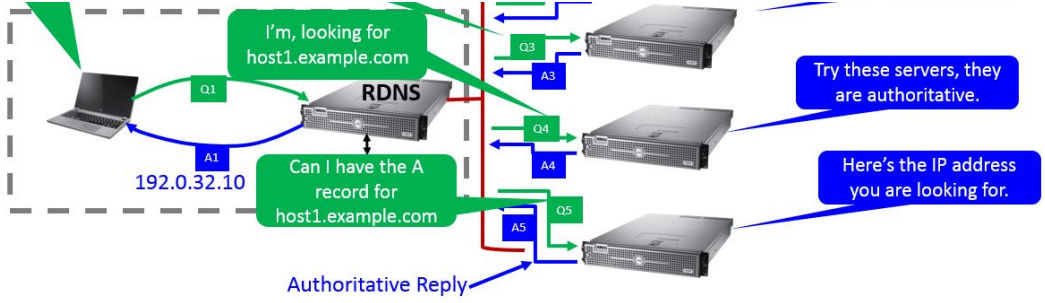
300 Multiple Choices
301 Moved Permanently
302 Found
303 See Other
★ 304 Not Modified
305 Use Proxy
306 (Unused)
307 Temporary Redirect
308 Permanent Redirect (experimental)

4xx Client Error

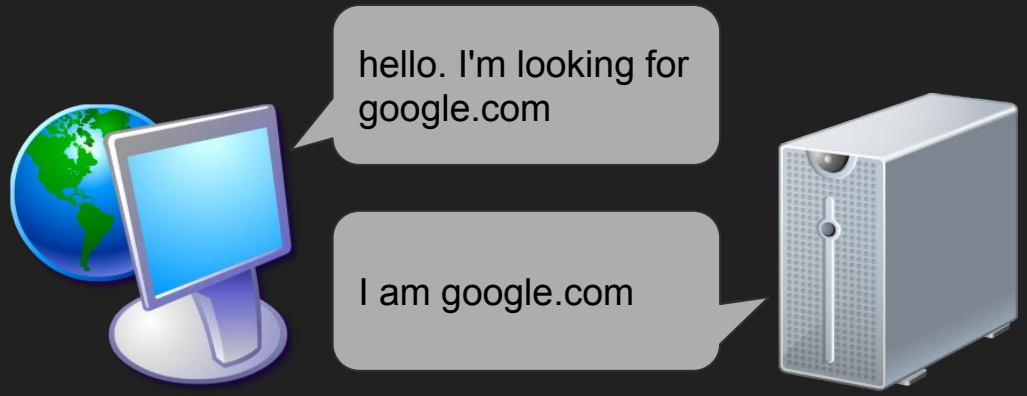
★ 400 Bad Request
★ 401 Unauthorized
402 Payment Required
★ 403 Forbidden
★ 404 Not Found
405 Method Not Allowed
406 Not Acceptable
407 Proxy Authentication Required
408 Request Timeout
★ 409 Conflict
410 Gone
411 Length Required
412 Precondition Failed
413 Request Entity Too Large
414 Request-URI Too Long
415 Unsupported Media Type
416 Requested Range Not Satisfiable
417 Expectation Failed
418 I'm a teapot (RFC 2324)
420 Enhance Your Calm (Twitter)
422 Unprocessable Entity (WebDAV)
423 Locked (WebDAV)
424 Failed Dependency (WebDAV)
425 Reserved for WebDAV
426 Upgrade Required
428 Precondition Required
429 Too Many Requests
431 Request Header Fields Too Large
444 No Response (Nginx)
449 Retry With (Microsoft)
450 Blocked by Windows Parental Controls (Microsoft)
451 Unavailable For Legal Reasons
499 Client Closed Request (Nginx)

5xx Server Error

★ 500 Internal Server Error
501 Not Implemented
502 Bad Gateway
503 Service Unavailable
504 Gateway Timeout
505 HTTP Version Not Supported
506 Variant Also Negotiates (Experimental)
507 Insufficient Storage (WebDAV)
508 Loop Detected (WebDAV)
509 Bandwidth Limit Exceeded (Apache)
510 Not Extended
511 Network Authentication Required
598 Network read timeout error
599 Network connect timeout error



for CTFs



- we can just think of the web as a way to talk to some other computer
- we use the web to send messages back and forth between computers
  - these are called *packets*

simplified server-client model

example

client

user navigates to example.com

```
GET /index.html HTTP/1.1
Host: example.com
```

example.com server

```
HTTP/1.1 200 Success
Server: example.com
Content-Type: text/html
<!DOCTYPE HTML>
...
<script src="/scripts/index.js">
...
```

```
GET /scripts/index.js HTTP/1.1
Host: example.com
```

example

client

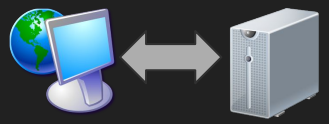
```
HTTP/1.1 200 Success
...
function submitForm() {
    fetch("/login", {method: "post", body: {username: ..., password: ...}}).then(() => ...);
}
...
```

example.com server

...
user submits form/clicks button/presses enter, submitForm() runs in the browser
a login request is created by the JavaScript code

```
POST /login HTTP/1.1
Host: example.com
username=ggu&password=hunter2
```

example



```
SELECT * FROM User WHERE username  = 'ggu'
   AND password = '769994529e9e073c3c661ccf25350b70';
```

underlying database

```
username | email         | password
-----------------------------------
ggu      | gu@utexas.edu | 75999...
```

the server now knows the user exists and has the correct password
now it will log the user in...

example

client

HTTP/1.1 200 Success
...
Set-Cookie: token=eyJhbGciOiJIUzI1NiIsInR5cCI6I...

OK

example.com server

The browser now stores the cookie on disk. Every access to the server will now have the "token" cookie attached automatically.

GET /friends HTTP/1.1
Host: example.com
Cookie: token=eyJhbGciOiJIUzI1NiIsInR5cCI6I...

The server now knows who the client is because it can check the cookie.

Attacking cookies

- The server gives us a cookie to remind it who we are logged in as
- Since the cookie belongs to us, we can change it to whatever we want
  - Usually Inspect Element -> Application -> Storage -> Cookies
- A good server would "sign" the cookie to make sure it's not fake
  - JWT tokens are popular
    - eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJzdWIiOiIxMjM0NTY3ODkwIiwibmFtZSI6IkpvaG4gRG9lIiwiaWF0IjoxNTE2MjM5MDIyfQ.SflKxwRJSMeKKF2QT4fwpMeJf36POk6yJV_adQssw5c
    - "None" algorithm

- Log in as "thelegend27" here: http://ggu.isss.io/cookies

Bypassing client-side sanitization

- Sometimes the site sanitizes/checks a value entirely on the client-side
- e.g. "The username must not contain HTML characters", "Must not be empty"
- Tricking the server into accepting an invalid value can break things

- A few ways to do this:
  - Mess with the JavaScript in the page (rewrite a function)
  - Use Firefox "Edit and Resend" feature (don't forget to change "Content-Length" header)
  - Network -> right click on request -> "copy as cURL" -> copy into terminal
- Login as admin here: http://ggu.isss.io/client_side

Stored XSS

- Suppose a user posts a message, and the server simply places the message into the website
- user123 says: I am <script>fetch("/deleteAccount", {method: "post"});</script> a hacker
- What can happen?
  - Cookies get leaked
  - XSS worm
  - Accounts get hijacked

- Gain admin status here: http://ggu.isss.io/tickets
  - Look up how to make a GET request in JavaScript (fetch is easiest)

SQL Injection

- Attacks the connection between the server and database (SQL)
- Similar idea to XSS
- SELECT * FROM users WHERE username = 'admin'; -- ' and password = '_';

- Also know about: UNION, blind SQL (bSQLi), information schema
- SELECT username, email FROM username WHERE username = '';

Common Beginner CTF Problems

- robots.txt file
- .git directory
- jwt.io
- SQL injection
- OWASP top 10

Questions