Finish Communications
Logging In
Systems

cs380
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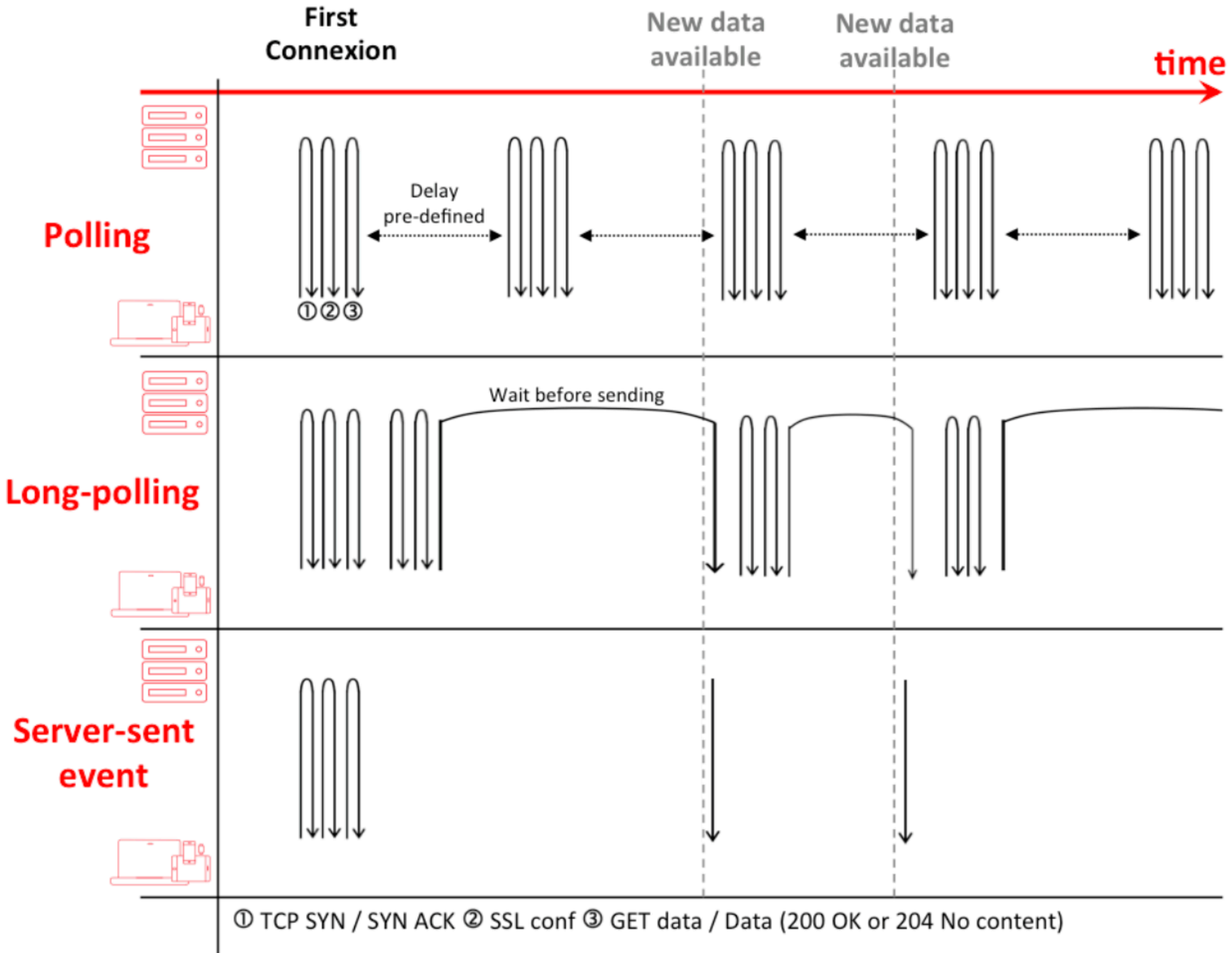
Server Sent Events

- Long Polling without setup/teardown of connection
- Same server-side concerns for open connections
- ONE WAY!!
  - Only time client says anything to server is at setup
  - GET only



Server-sent events

- javascript EventSource
  - need to write “handlers” for message types
  - default handlers
- PHP
  - message syntax is important but otherwise can look kind of like a long poller, except:
    - Syntax of response is special
    - After sending one response, the return to the loop and send another …
  - “retry” is a poll-like thing

```php
echo "event:basic\n";
echo "data:" . json_encode($a) . "\n\n";
echo "retry:" . ($reload*1000) . "\n";
ob_flush();
flush();
```

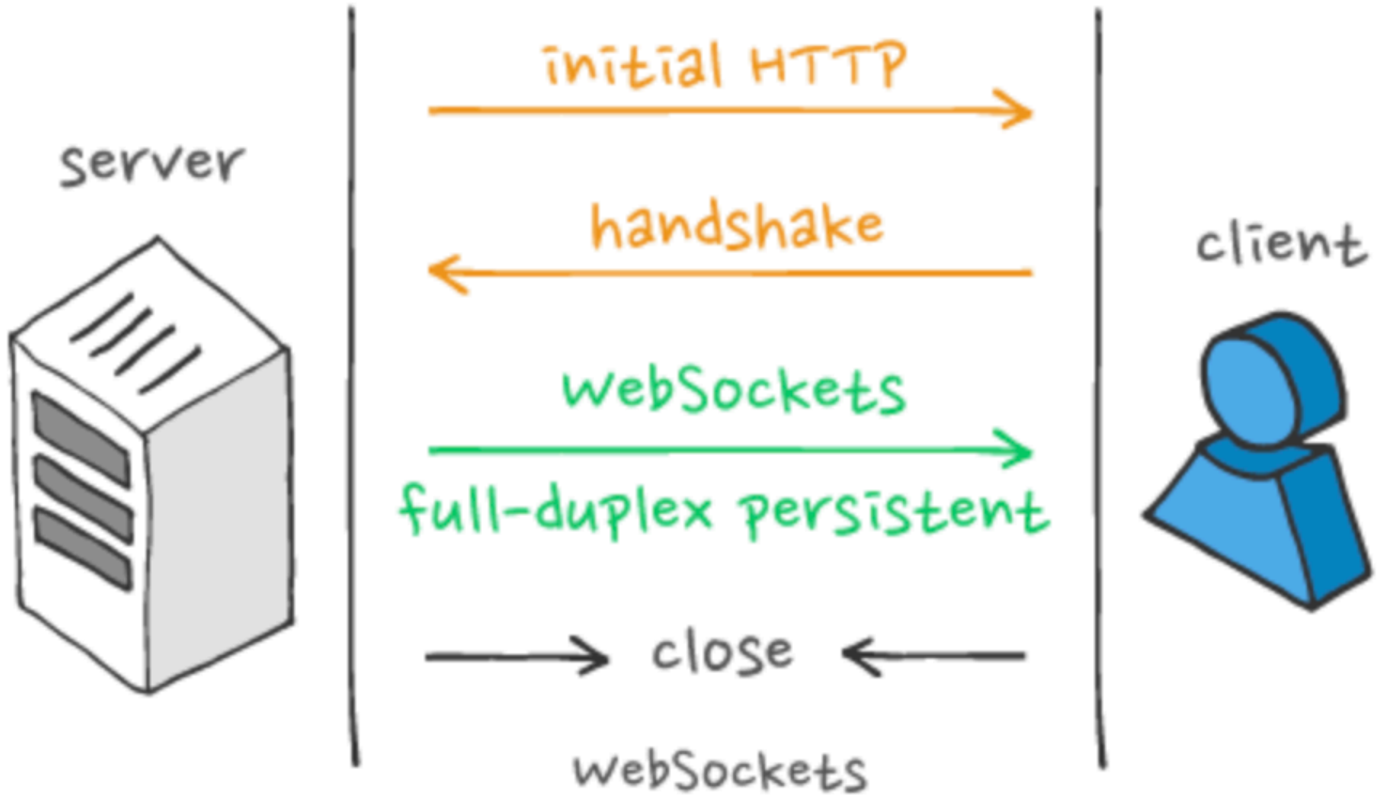
File: eventer.html

evented.php

Fully symmetric communication

Web Sockets

- Node is most widespread implementation
  - Usually called Node.js
- On server side, NOT apache, or Nginx, ..
- low-latency, full-duplex communication makes the location of code less important



For much more: https://www.youtube.com/watch?v=jo_B4LTHi3I

JSON

- JavaScript Object Notation
  - Nothing really to do with javascript
- A way of encoding arrays and dictionaries
  - PHP and Javascript both have encode and decode functions
- Certainly the best way to communicate when polling/server-send events from PHP to Javascript
- Can also send from Javascript to PHP

```php
<?php
$a = [1,2,3,"aa", "bb", "aa"];
echo json_encode($a);
echo "\n";
$b=["a"=>"b", 2=>3, 4=>"q", "b"=>[1,2,3,4]];
echo json_encode($b);
echo "\n";
?>
/** Normally only return a single JSON
object from PHP **/
```

```
[1,2,3,"aa","bb","aa"]
{“a":"b","2":3,"4":"q",
 "b":[1,2,3,4]}
```

JSON — pt2

Sending and receiving JSON

```
const jsonn = {"email": "hey@mail.com", "password": "101010"};
const dataToSend = JSON.stringify(jsonn);

function sendFetch() {
    fetch("sendJSON.php", {
        method: "post",
        headers: { "Content-Type": "application/json" },
        body: dataToSend
    })
    .then(function(response) {
                response.text()
                .then(function(txt) {
                    console.log(txt);
                    json=JSON.parse(txt);
                    console.log(json["email"]);
            });
    });
}

function sendJQ() {
    let posted = $.post("sendJSON.php", dataToSend);
    posted.done( function(data) {
                        console.log(data);
                        console.log(data["email"]);
                    });
}
```

```
<?php
// Handling data in JSON format on the server-side using PHP
header("Content-Type: application/json");
// build a PHP variable from JSON sent using POST method
$v = json_decode(stripslashes(file_get_contents("php://input")));
$v->hello='geoff';
$vv = (array)$v;
$vv["success"] = true;
echo json_encode($vv);
?>
```

Logging In

- Lots of systems require logins
- There are infinite approaches to this. I present one
- Requires at least
  - 1 html page
  - 1 php page
  - 1 database table

```
create database if not exists login;

use login;
drop table if exists users;

create table users (
       userNumber int not null auto_increment,
       loginname varchar(64) NOT NULL,
       passwd varchar(94),
       sectionid int,
       primary key (userNumber)
       );
```

Allow one table to support multiple pages

Adding Users

- Requires a whole extra system
- In this case, I decided not to bother with html ...
- So just a php program

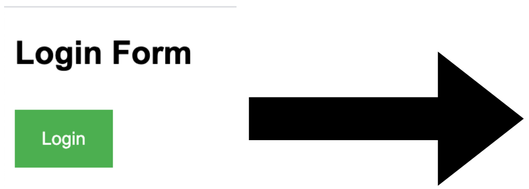
```php
<?php
// Use from command line php -f adduser.php name=XXXX pass=YYYY
// where both XXXX and YYYY are clear text
foreach ($argv as $arg) {
    $e=explode("=",$arg);
    if(count($e)==2)
        $_GET[$e[0]]=$e[1];
    else
        $_GET[$e[0]]=0;
}
//Standard DB connection stuff here

$sql = "INSERT into users (loginname, passwd, sectionid) VALUES ('" .
$_GET["name"] . "', '".password_hash($_GET["pass"],PASSWORD_BCRYPT) .
"', 1)";
echo $sql;
echo "\n";
$result = $conn->query($sql);
?>
```

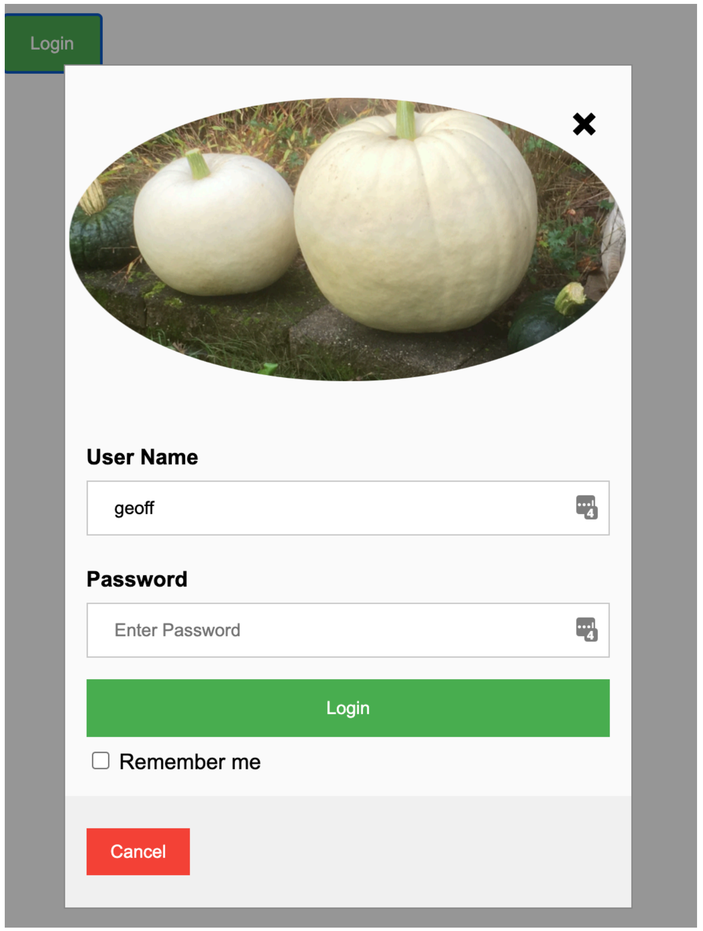
Login page

- Users hate page reloads so I use a lot of CSS and Javascript

- There are lots of opinions about “remember me” and how to implement
  - I chose a server side solution that does not save password



modallogin.html



Server Side of login

getSavedLogin.php

```php
<?php
session_start();
if (array_key_exists("username", $_SESSION)) {
    echo $_SESSION["username"];
}
else {
    echo "unknown";
}
?>
```

loginpage.php

```php
function login_check() {
    $sql = "select passwd from users where sectionid=1 and loginname='". $
    //echo $sql . "<br>";
    $result = $conn->query($sql);

    if ($result) {
        $row = $result->fetch_assoc();
        if (password_verify($_REQUEST["passwd"], $row["passwd"])) {
            $_SESSION["loggedin"]=true;
            $_SESSION["sectionlog"]=1;
            if ($_REQUEST["remember"]) {
                $_SESSION["username"] = $_REQUEST["uname"];
            }
            else {
                unset($_SESSION["username"]);
            }
            return "success";
        } else {
            $_SESSION["loggedin"]=false;
            unset($_SESSION["sectionlog"]);
            return "bad password";
        }
    } else {
        $_SESSION["loggedin"]=false;
        unset($_SESSION["sectionlog"]);
        return "bad username";
    }
}
```

More from the server side

```
<html>
    <body>
        <?php
            start_update_session();
            $result = login_check();
            if ($result == "success") {
                header("Location:
nextpage.php", true, 301);

                //include("nextpage.php");
            } else {
                header("Location:
modallogin.html", true, 301);

            }
?>
</body>
</html>
```

```
<?php
function start_update_session() {
    if (session_status() != PHP_SESSION_ACTIVE) {
        session_start();
    }
    $now = time();
    if (isset($_SESSION['discard_after']) && $now > $_SESSION['discard
        // this session has worn out its welcome; kill it and start a
        session_unset();
        session_destroy();
        session_start();
    }
    $_SESSION['discard_after'] = $now + 3600;
}

function good_session() {
    if (array_key_exists("loggedin", $_SESSION) && $_SESSION["loggedin
$_SESSION["sectionlog"]==1) {
        return true;
    } else {
        return false;
    }
}

?>
```

Systems

Towers of Hanoi

- Goal: provide a way for 206 students to have friendly competition with the towers of Hanoi
- Design: a stopwatch with Hanoi instructions
- A backend to generate a graph of times.
  - Graph drawn on html canvas object

Files: towers.html, aaa.php

```
create database if not exists hanoi;

use hanoi;
drop table if exists timedata;

create table timedata (
       id int NOT NULL auto_increment primary
       actor varchar(64),
       witness varchar(5),
       time varchar(10)
       );
```