

VAPOR + NIO

CONCURRENCY: A SWIFT ON THE SERVER STORY

OUTLINE

- > IPHONE VS SERVER DEVELOPMENT
- > WHY CONCURRENCY IS DIFFERENT ON THE SERVER
 - > HOW NIO HELPS

IPHONE POWER

IPHONE 6

IPHONE X

RAM

1GB

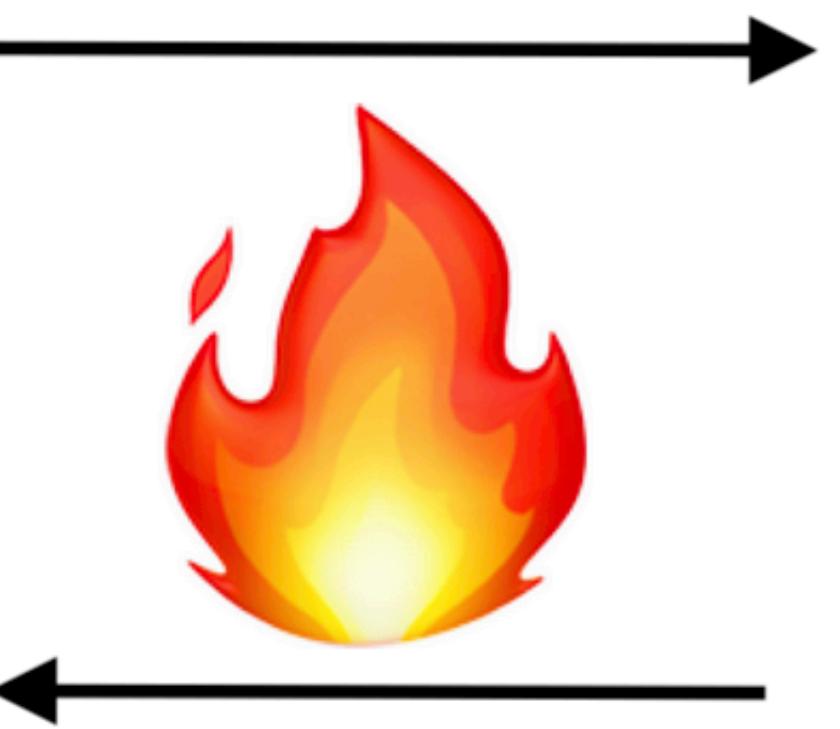
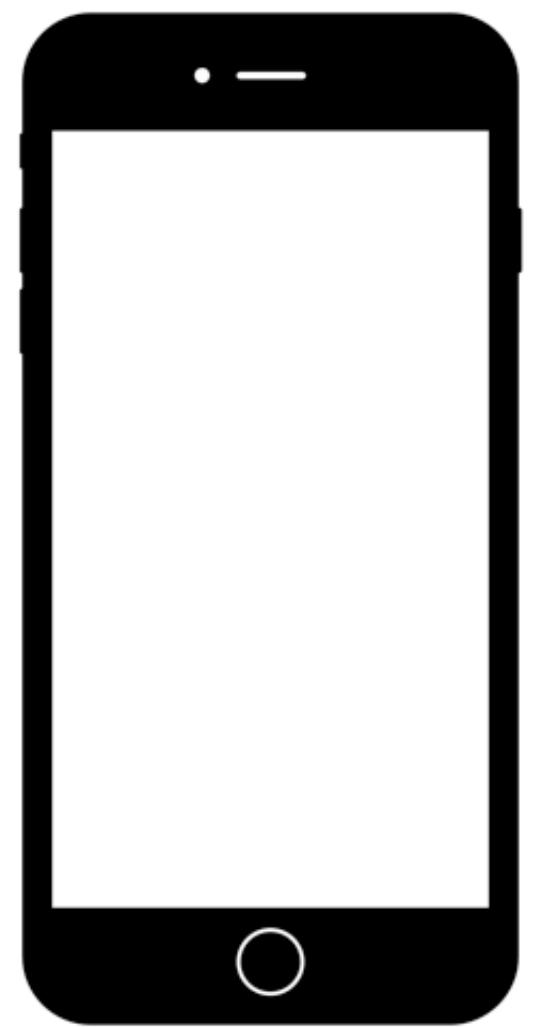
3GB

CPU

1.4GHZ DUAL-CORE

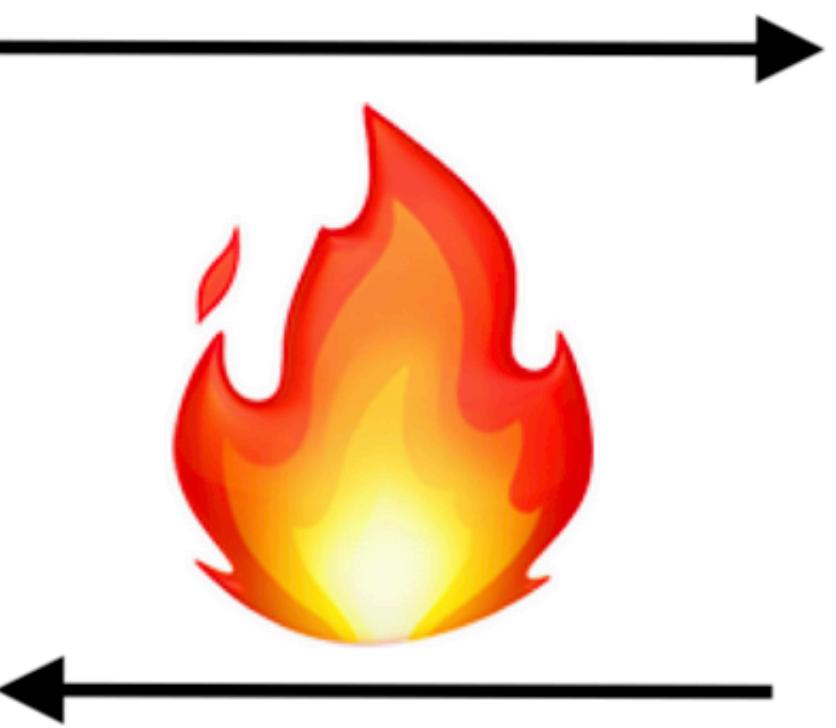
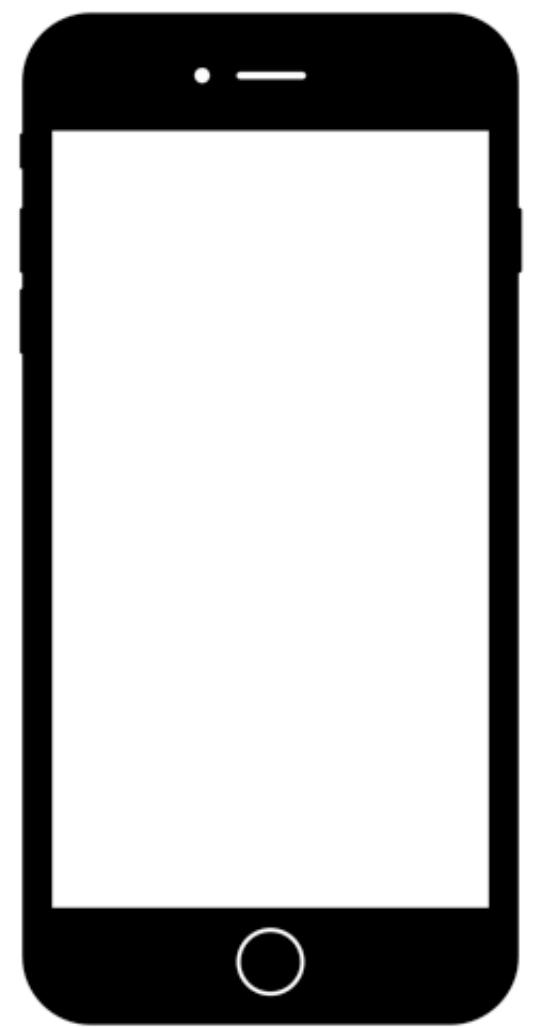
2.39 GHZ HEXA-CORE

IPHONE DEVELOPMENT



IPHONE DEVELOPMENT

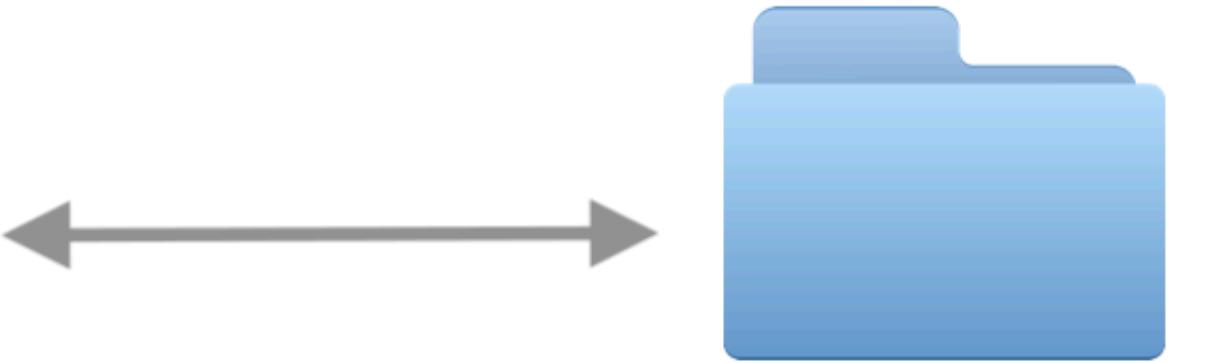
> 1 DEVICE FOR 1 USER



IPHONE DEVELOPMENT

- > 1 DEVICE FOR 1 USER
- > "EASY" PERSISTENCE

**State,
Preferences,
Defaults. Simple
Data**



NSUserDefaults

**KeyCodes
Tokens
Etc**



KeyChain

**General Objects,
Offline Cache,
etc.**



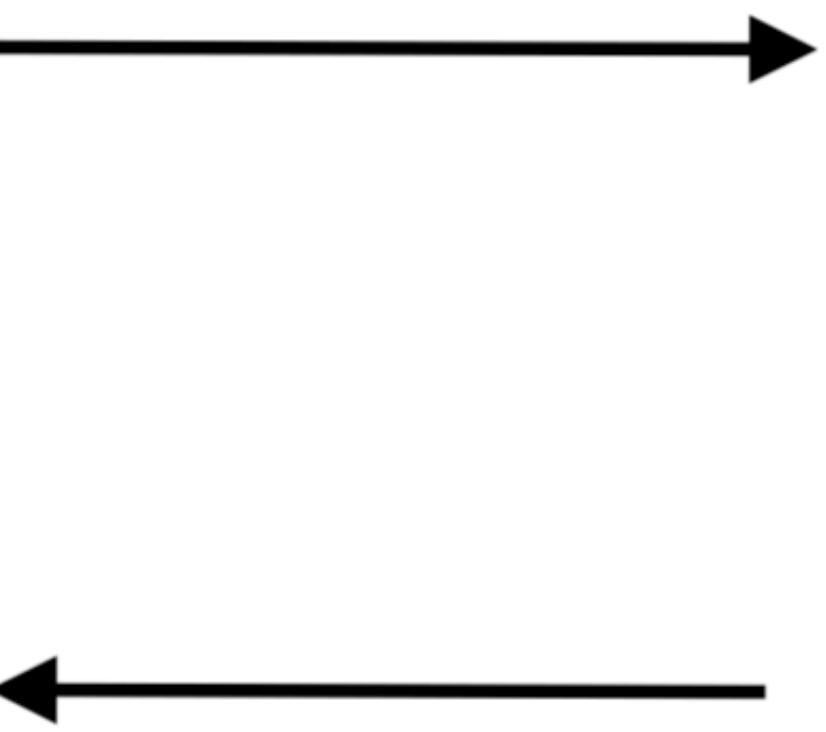
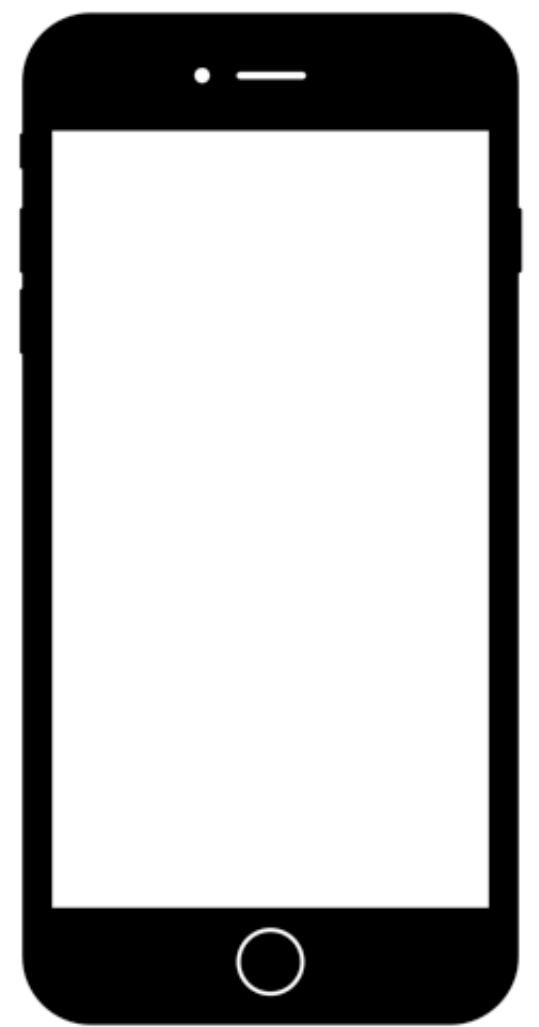
CoreData, Realm, etc...

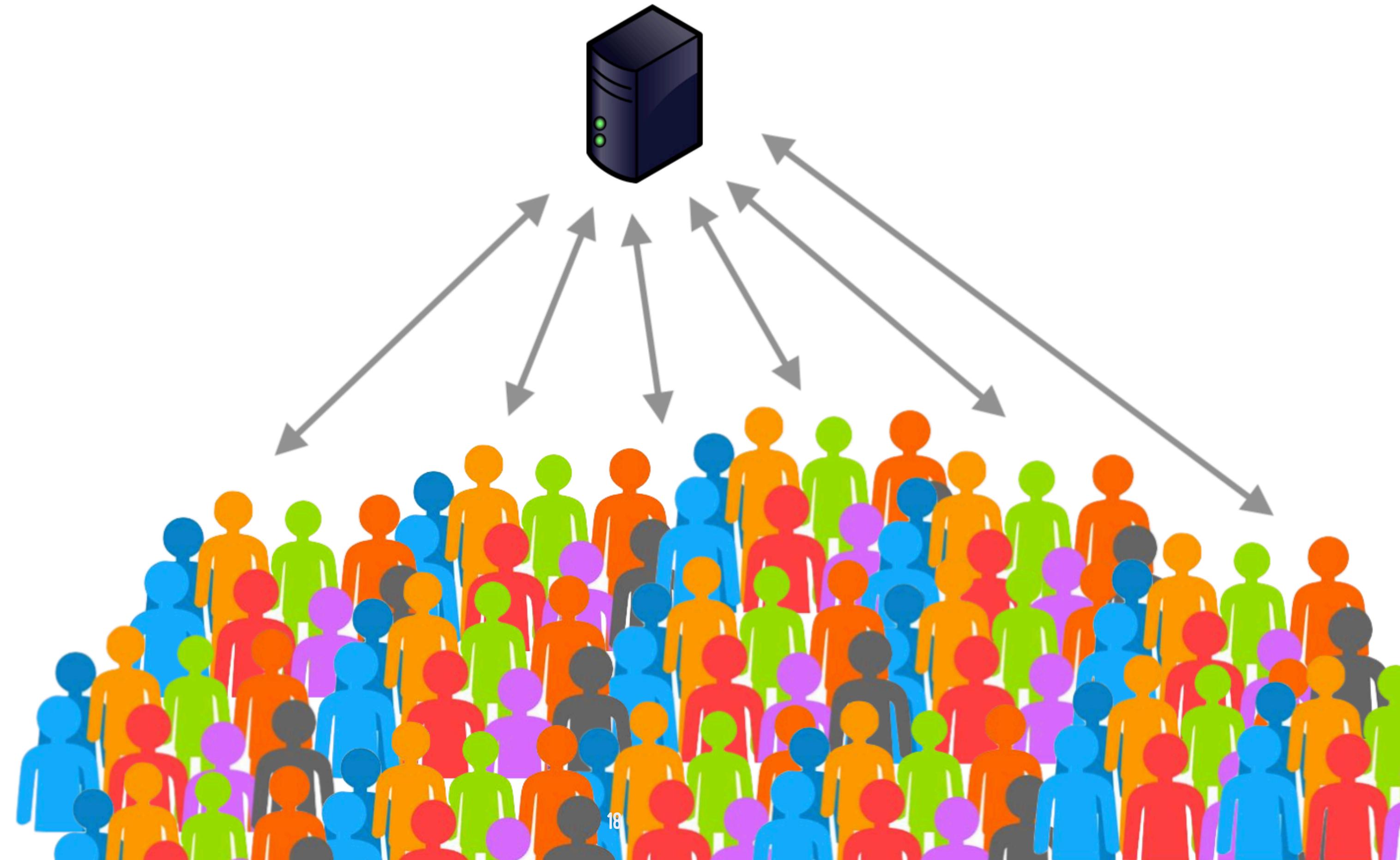
IPHONE DEVELOPMENT

- > 1 DEVICE FOR 1 USER
- > "EASY" PERSISTENCE
- > LESS COMPETITION FOR RESOURCES

SERVER DEVELOPMENT

> **MINIMUM** DEVICES FOR **MAXIMUM** USERS

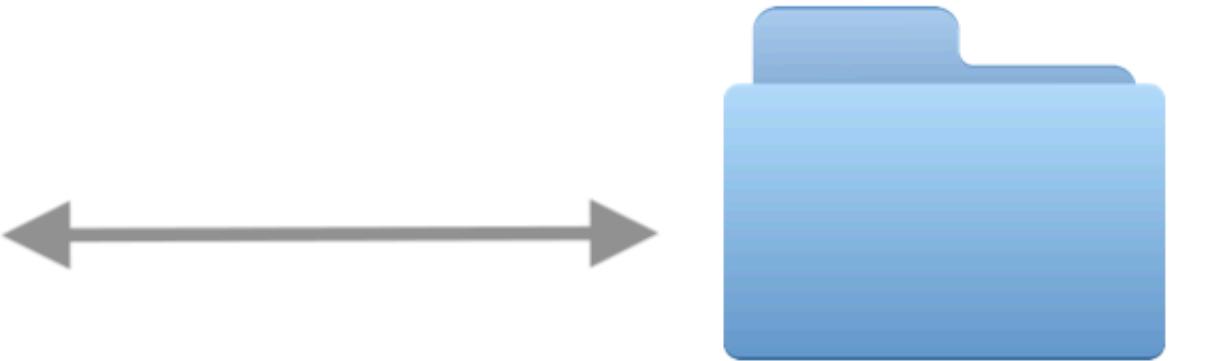




SERVER DEVELOPMENT

- > **MINIMUM** DEVICES FOR **MAXIMUM** USERS
- > DIFFICULT PERSISTENCE

**State,
Preferences,
Defaults. Simple
Data**



NSUserDefaults

**KeyCodes
Tokens
Etc**



KeyChain

**General Objects,
Offline Cache,
etc.**

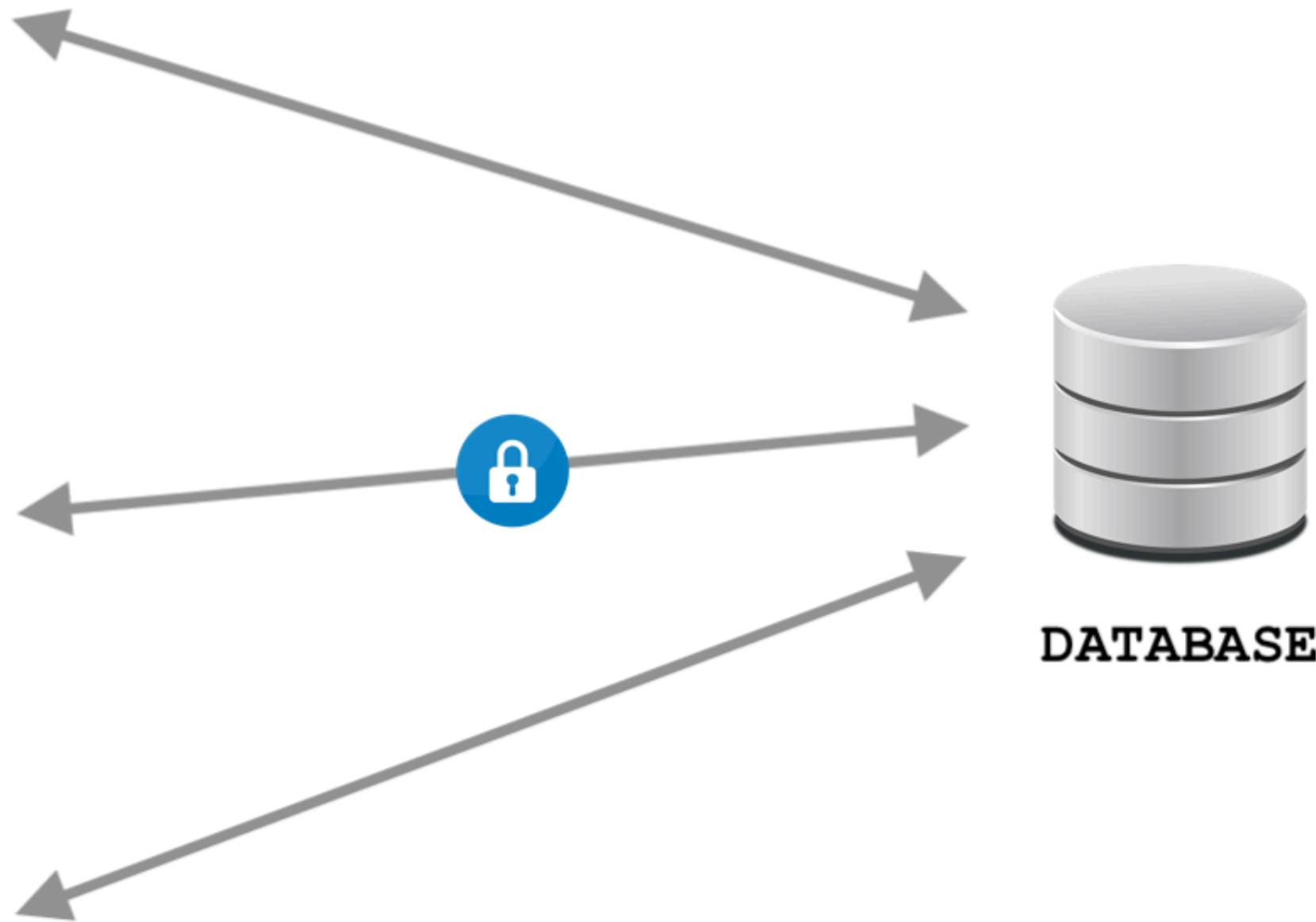


CoreData, Realm, etc...

State,
Preferences,
Defaults. Simple
Data

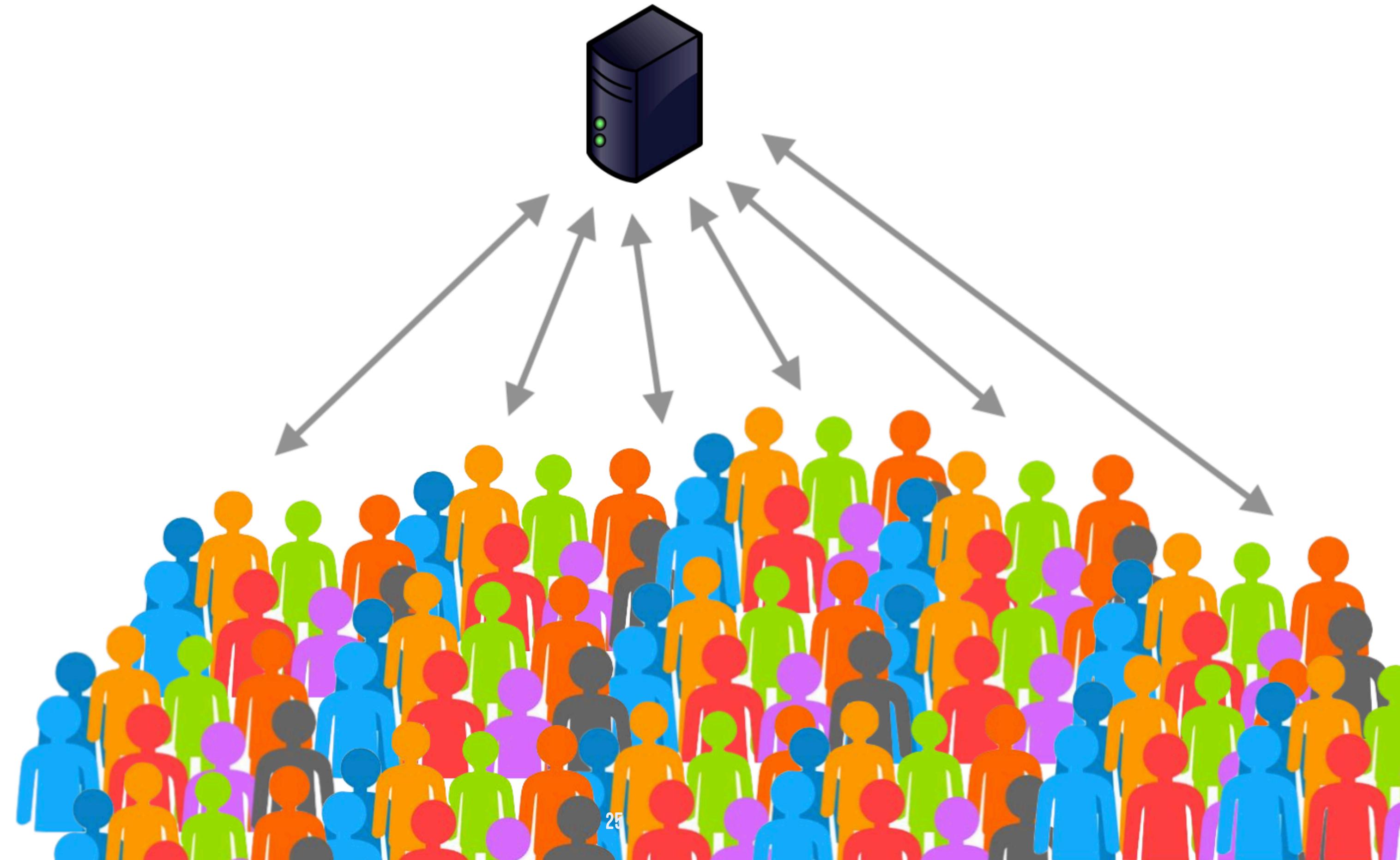
KeyCodes
Tokens
Passwords
Etc

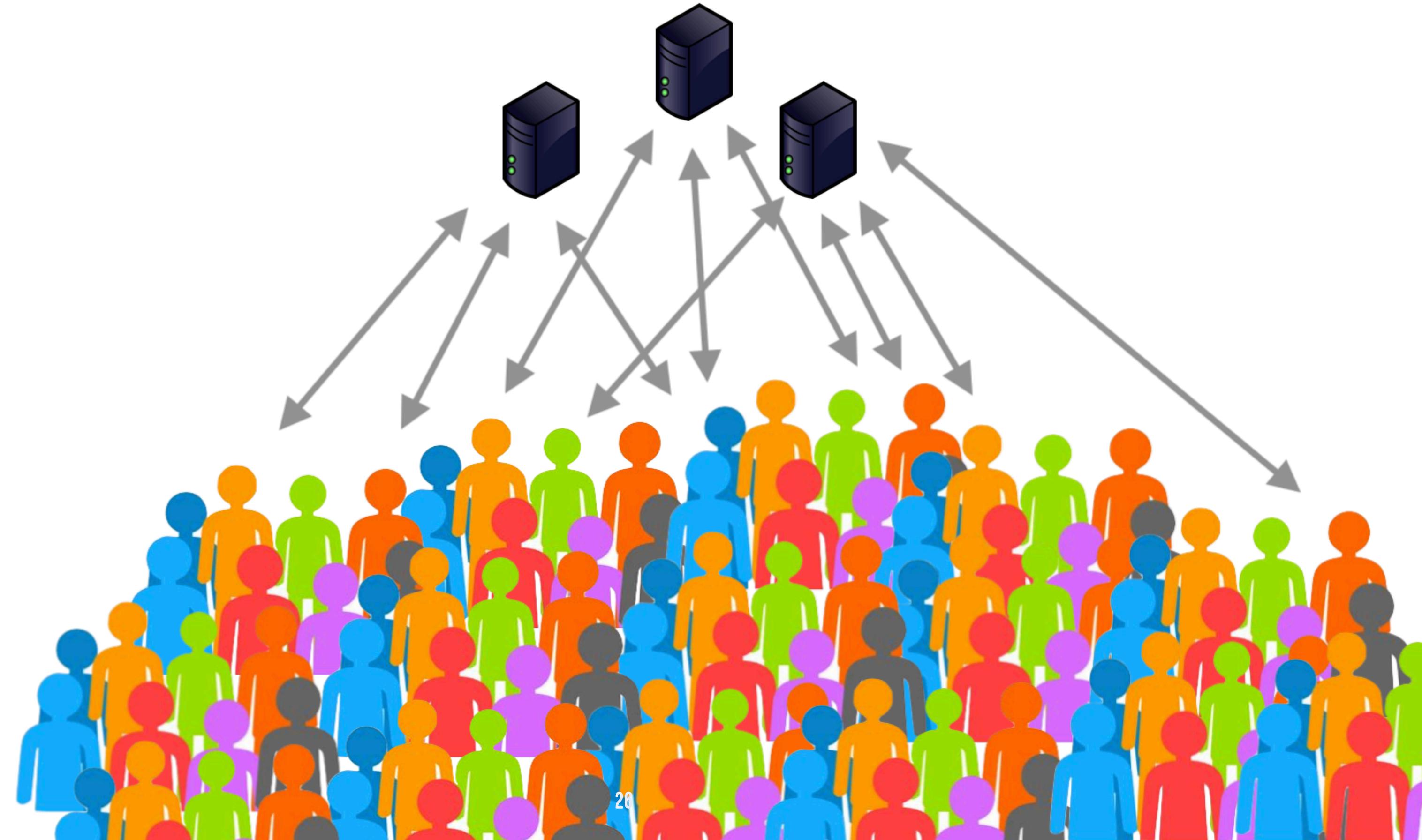
General Objects,
Offline Cache,
etc.



SERVER DEVELOPMENT

- > **MINIMUM** DEVICES FOR **MAXIMUM** USERS
 - > DIFFICULT PERSISTENCE
 - > HEAVY COMPETITION FOR **RESOURCES**
- > DIFFERENT DEVELOPMENT AND DEPLOY ENVIRONMENT
 - > **SCALING** ISSUES

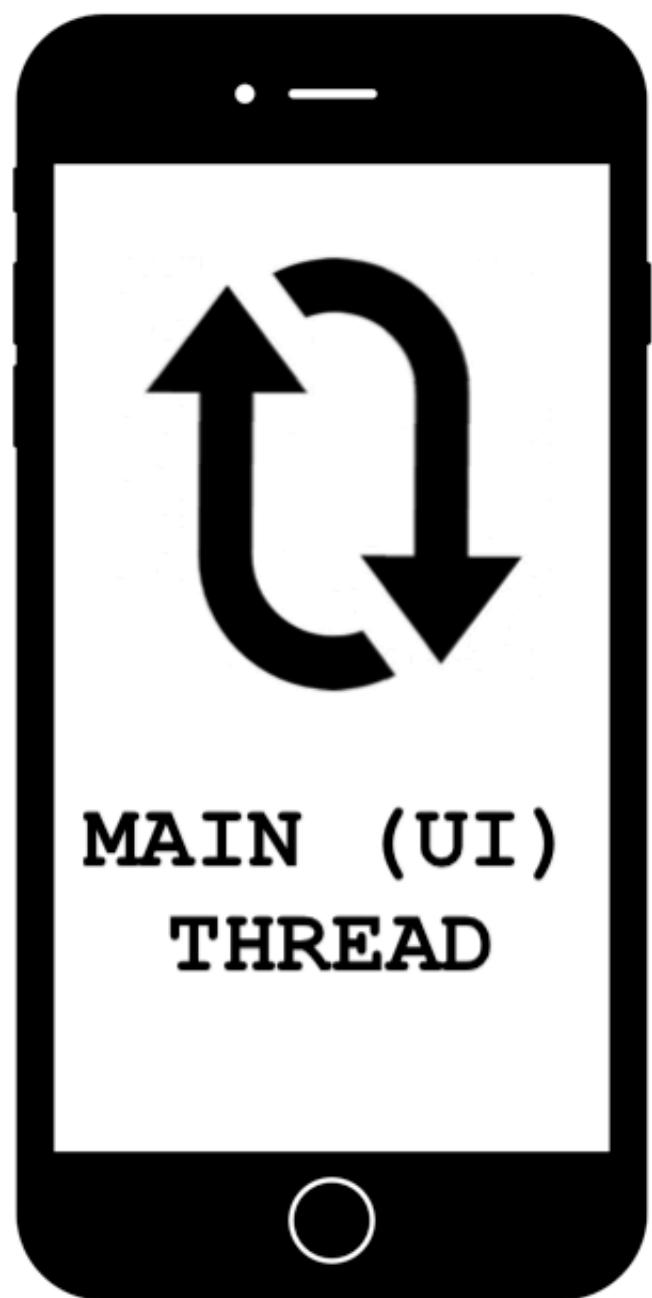




IPHONE CONCURRENCY

- › DISPATCH IS **KING**
- › DON'T BLOCK MAIN
- › **DON'T. BLOCK. MAIN.**

AVAILABLE THREADS

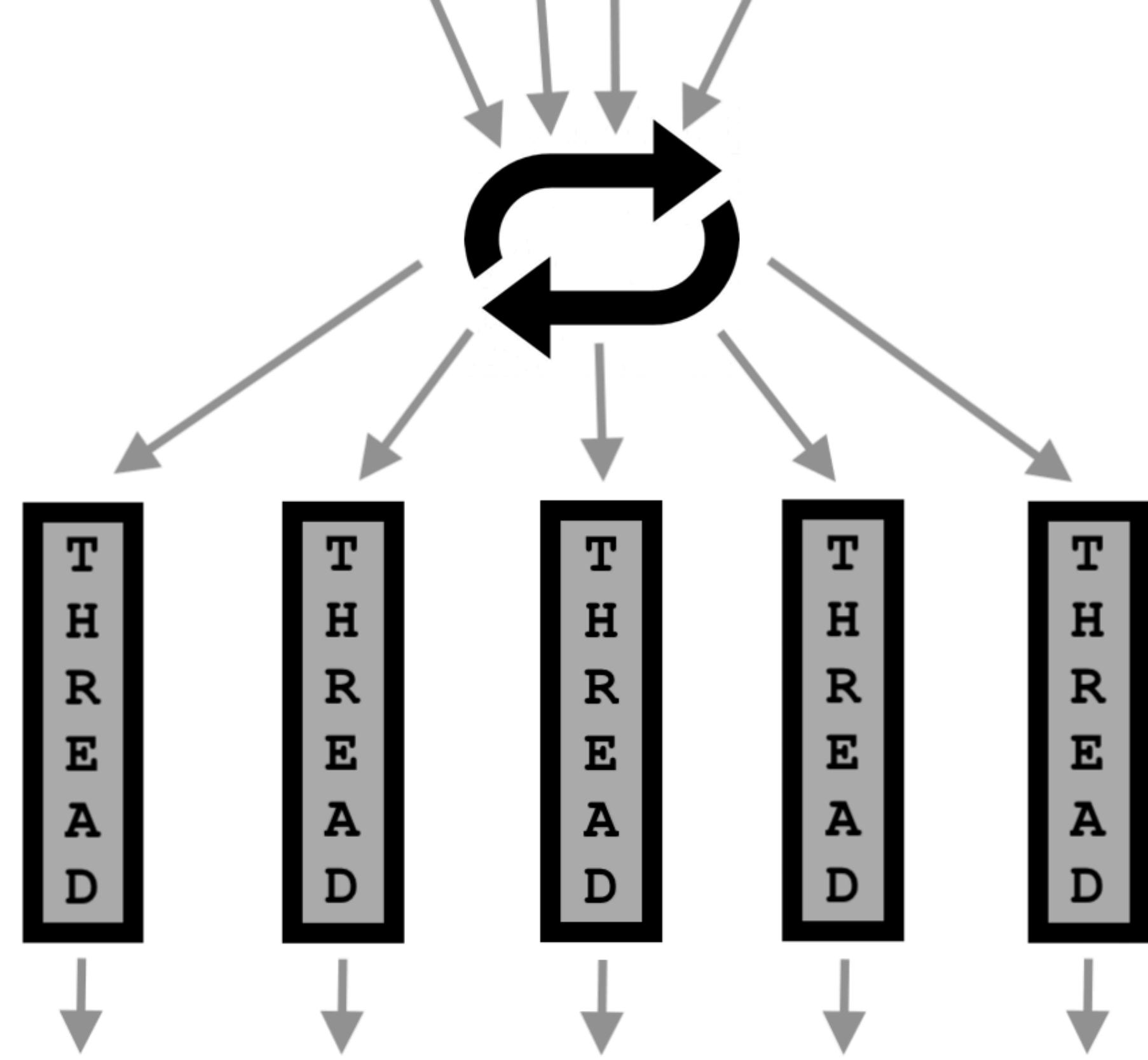


VAPOR 1.0

- > EXISTING CONCURRENCY OPTIONS 0
- > NO FOUNDATION OR **DISPATCH**

P_THREAD

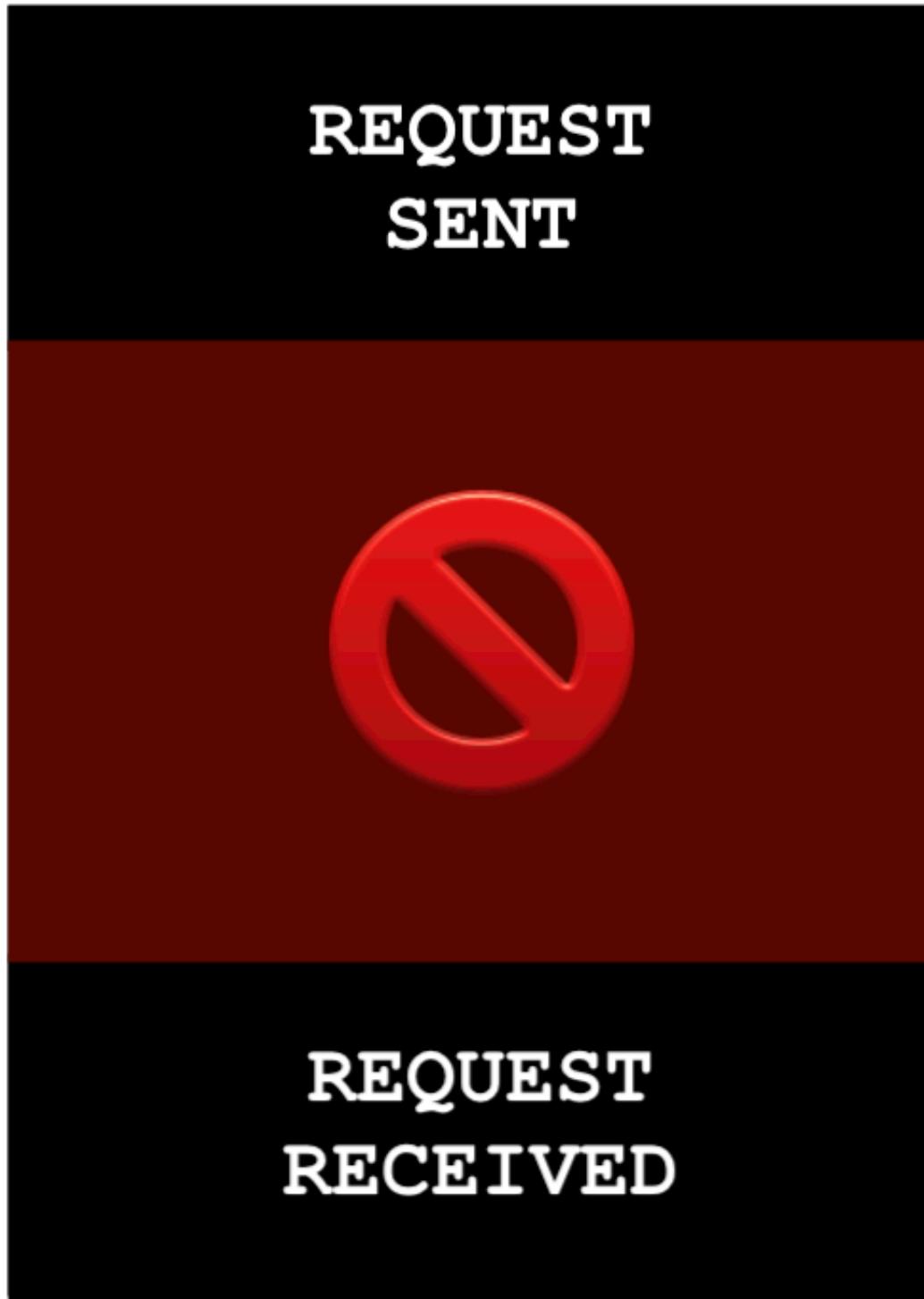
- > POSIX THREADS IN C
- > SIMPLE DISPATCH SYSTEM



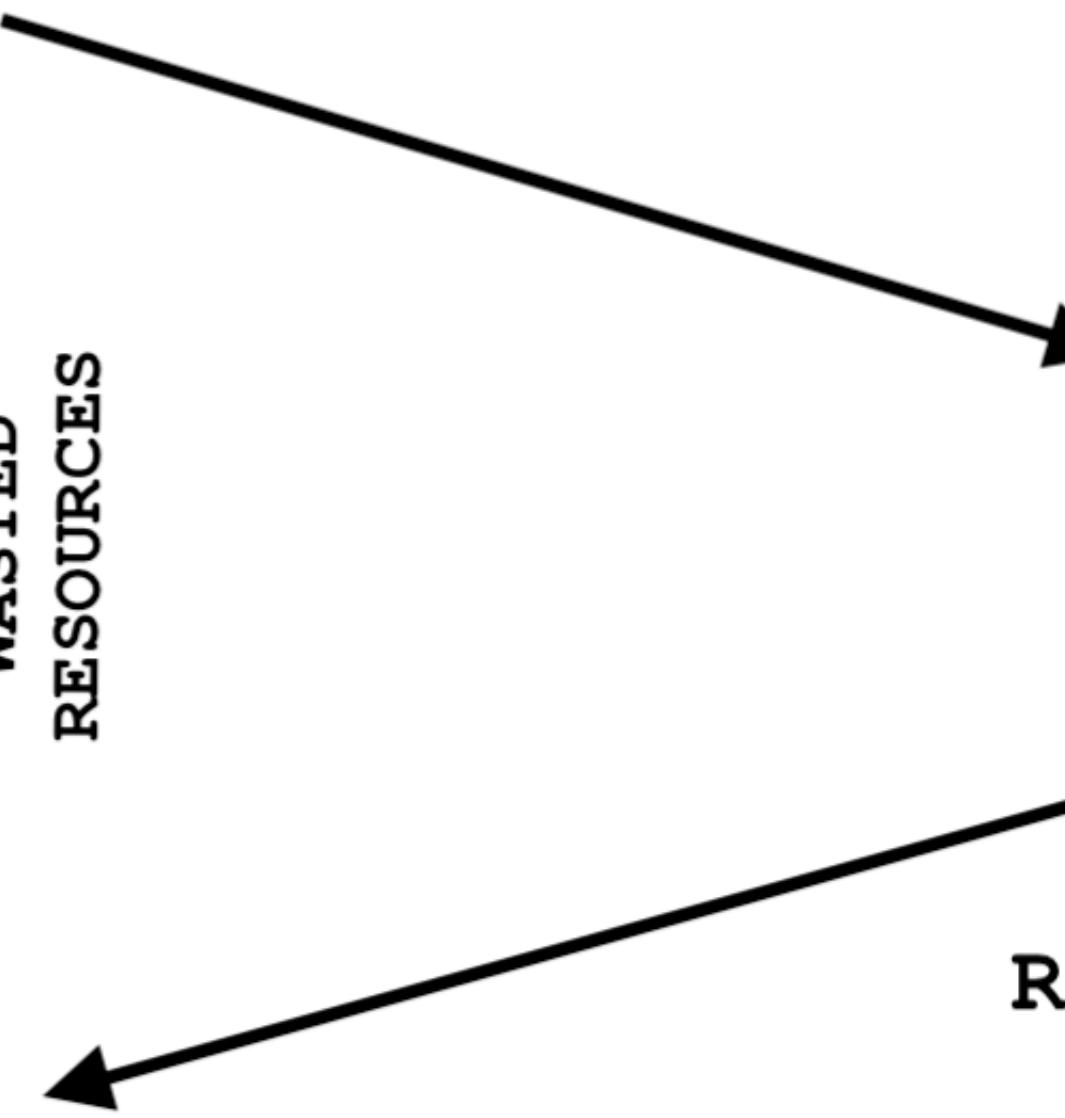
P_THREAD

- **POSIX** THREADS IN C
- SIMPLE DISPATCH SYSTEM
- 1 THREAD PER CONNECTION **BLOCKED** UNTIL DONE

THREAD



WASTED
RE SOURCES



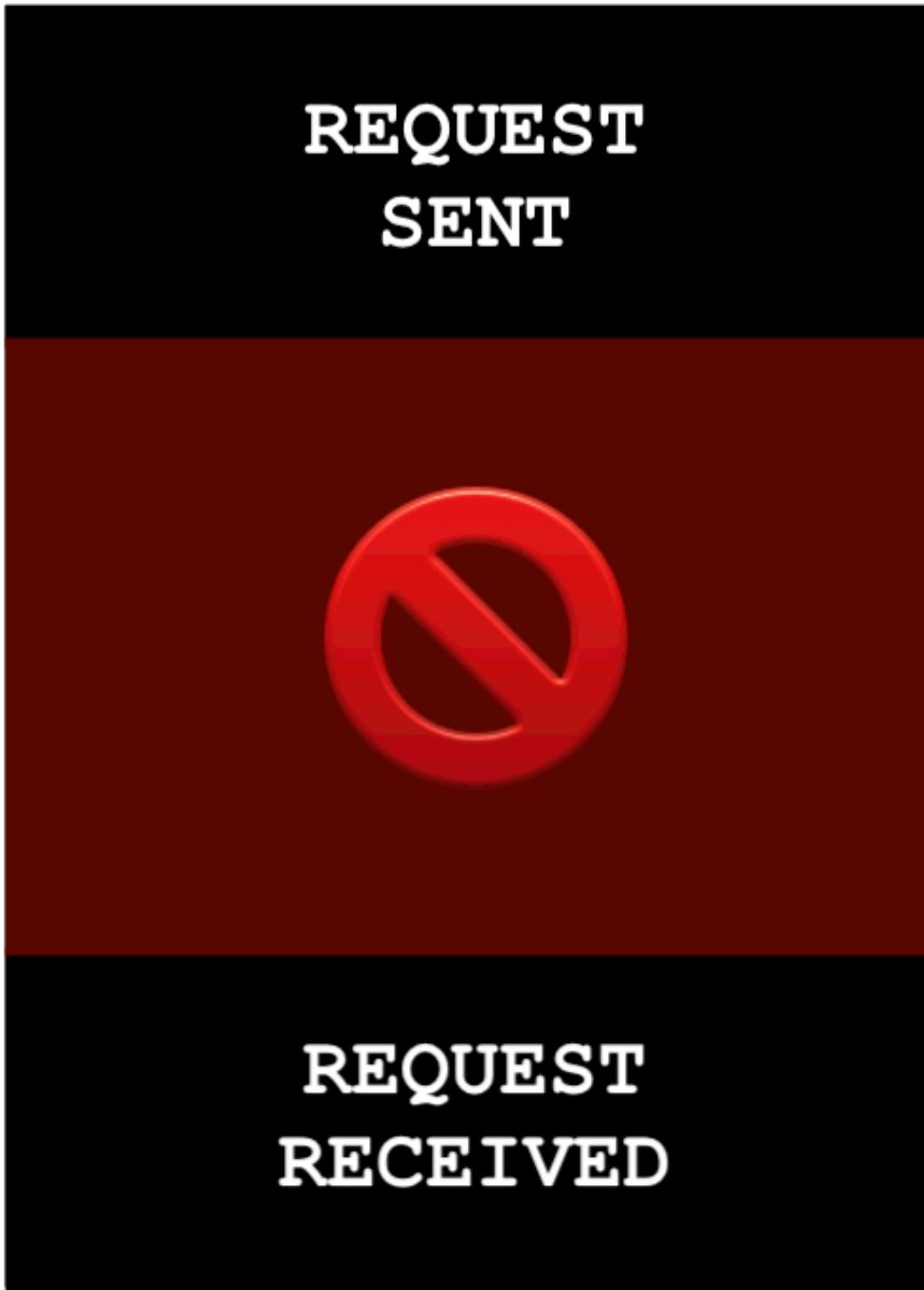
VAPOR 2.0 - DISPATCH

- › DISPATCH ON LINUX INTRODUCED
- › STILL USING A **BLOCKING** MODEL

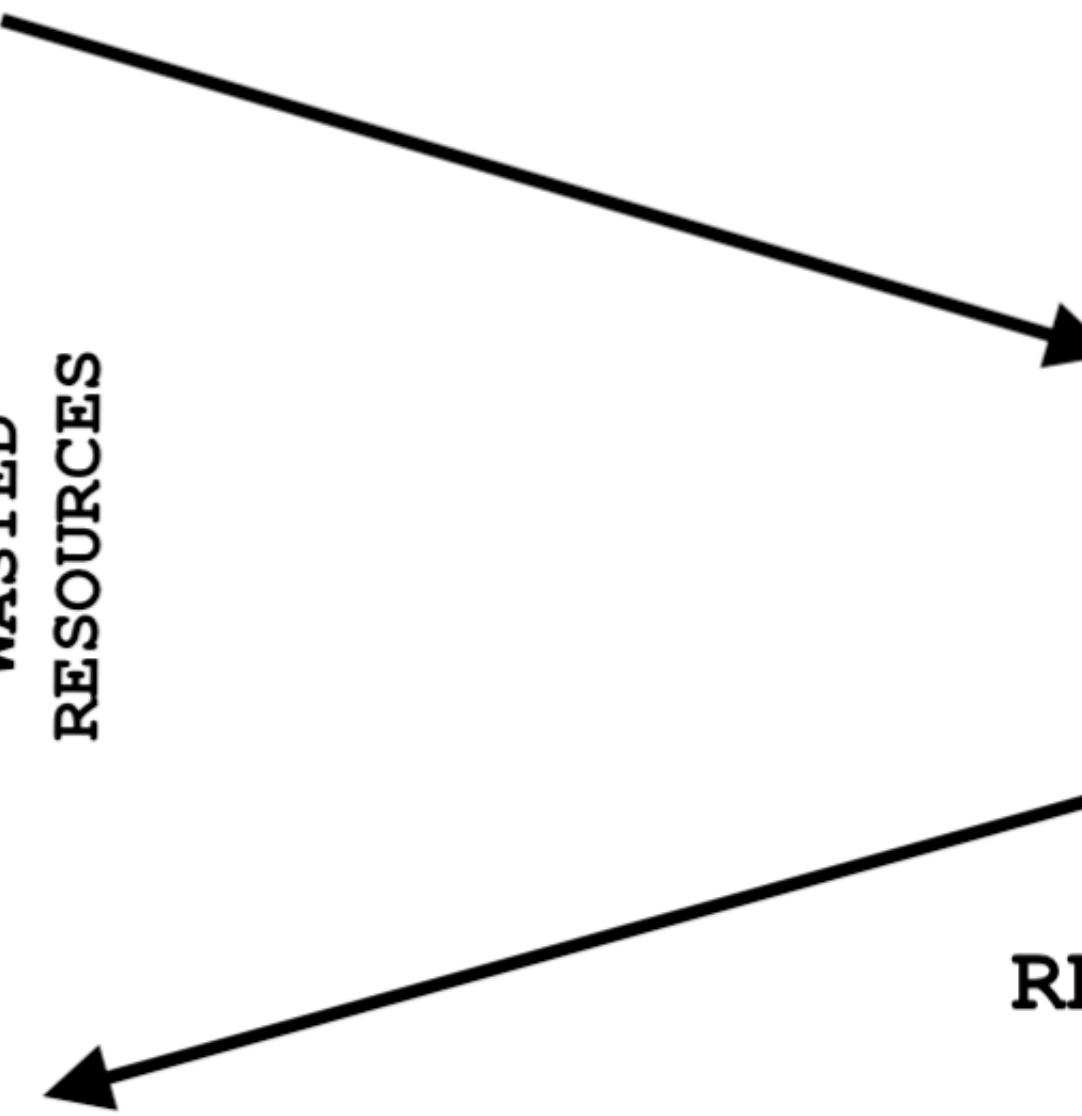
NON-BLOCKING I/O (**NIO**)

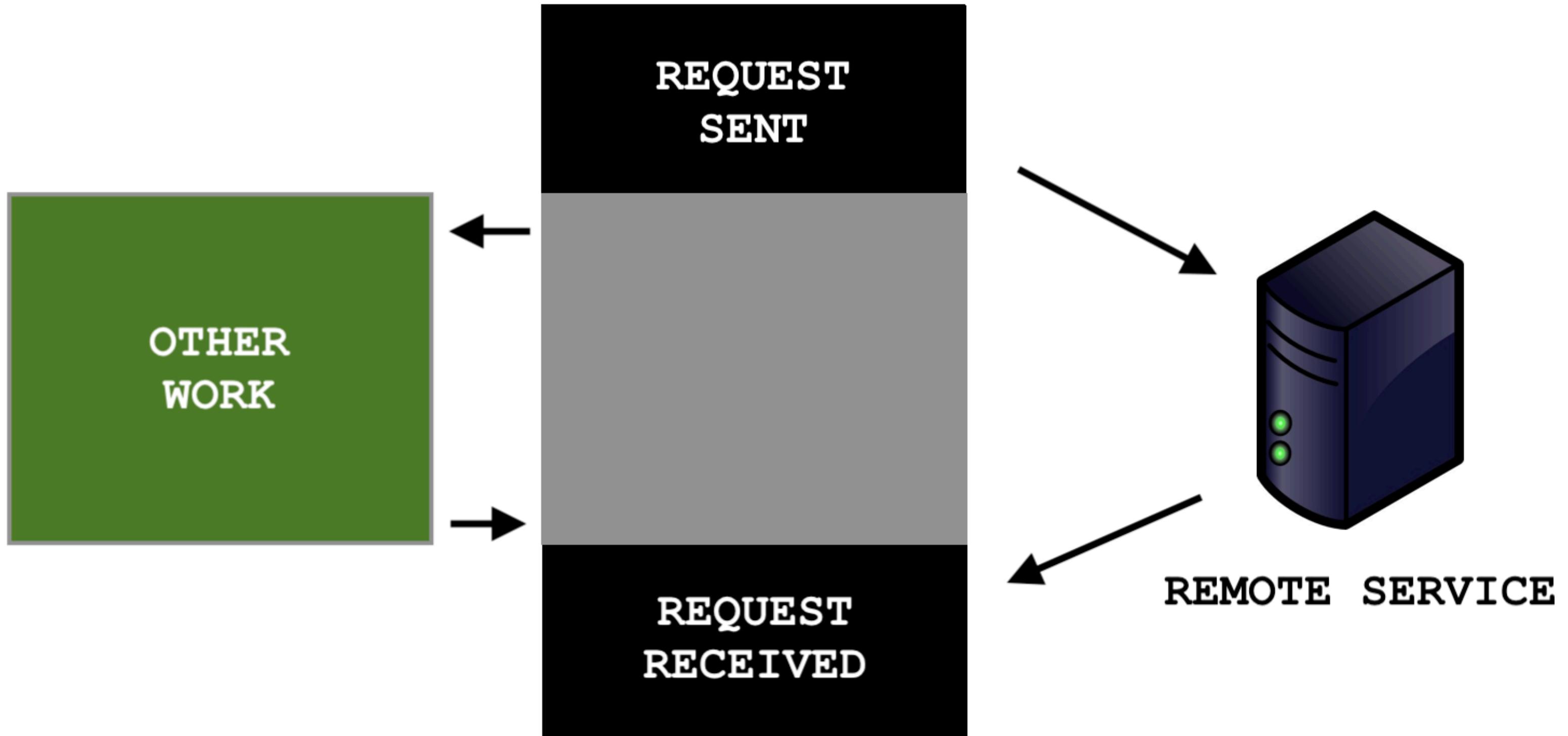
> **NON-BLOCKING** (IN THE NAME)

THREAD



WASTED
RE SOURCES



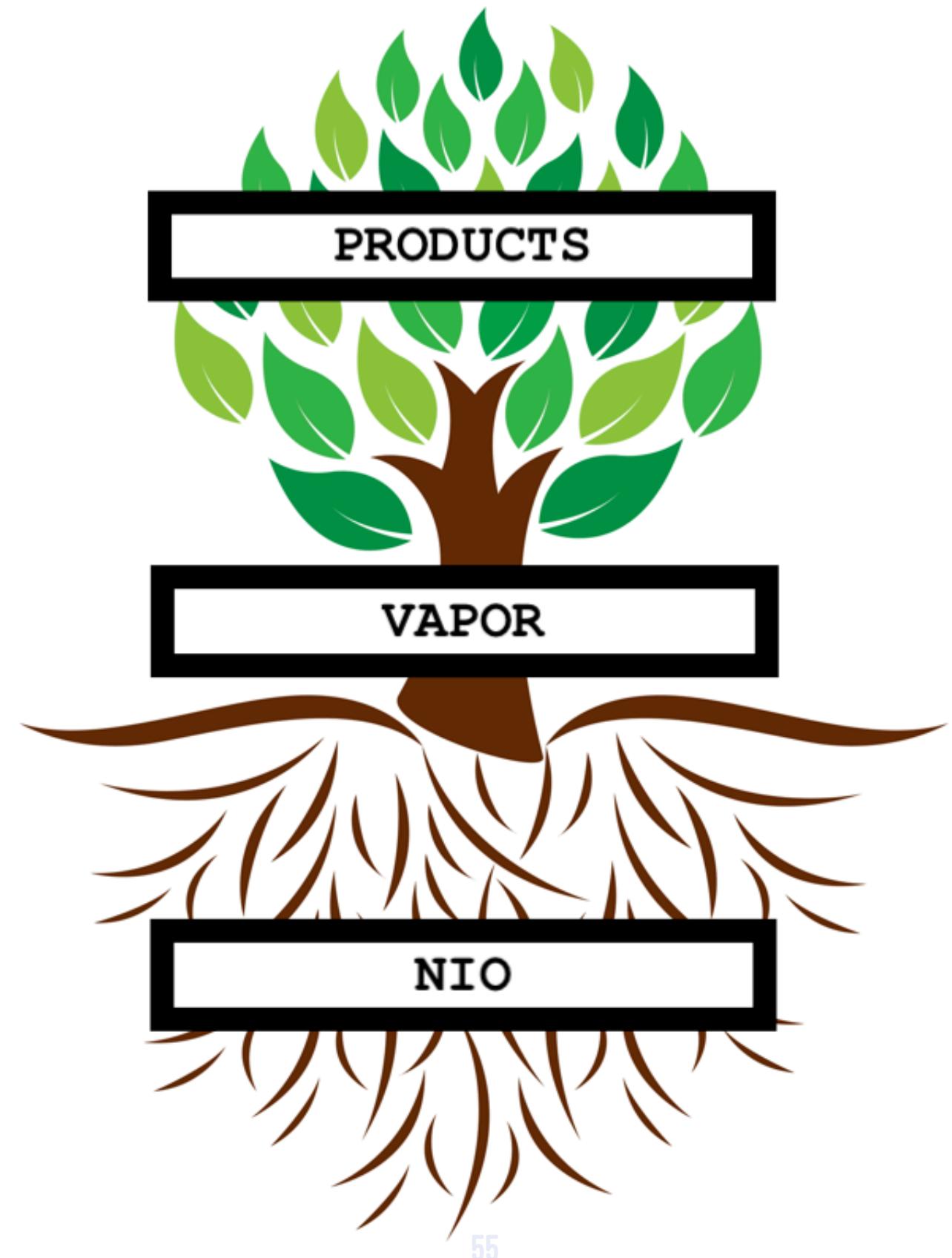


NON-BLOCKING I/O (**NIO**)

- **NON-BLOCKING** (IN THE NAME)
- HELPFUL LIBRARIES INCLUDING **HTTP** PARSERS
- WORLD CLASS TEAM WITH TONS OF EXPERIENCE

VAPOR 3 + NIO

- REPLACES MANY LOW LEVEL LIBRARIES



VAPOR 3 + NIO

- > REPLACES MANY LOW LEVEL LIBRARIES
 - > DEDICATED TEAM
- > MORE EYES ON THE CODE BASE, MORE USERS TO **BATTLE TEST**
 - > AS **NIO** IMPROVES, **VAPOR** IMPROVES

FUTURES

- > REACTIVE PROGRAMMING, PROMISES, ETC.
- > DECLARE WORK NOW TO BE COMPLETED LATER
 - > LOTS OF BLOCKS AND CLOSURES

```
extension Optional {  
    func map<T>(closure: (Wrapped) -> (T)) -> T? { }  
}
```

```
extension Array {  
    func map<T>(closure: (Element) -> (T)) -> [T] { }  
}
```

```
extension Future {  
    func map<T>(closure: (Result) -> (T)) -> Future<T> { }  
}
```

```
let foo: String?  
let bar: String? = foo.map { $0 + "!" }
```

```
let foo: [String]  
let bar: [String] = foo.map { $0 + "!" }
```

```
let foo: Future<String>  
let bar: Future<String> = foo.map { $0 + "!" }
```

```
extension Optional {  
    func map<T>(closure: (Wrapped) -> (T)) -> Optional<T> { }  
}
```

```
extension Array {  
    func map<T>(closure: (Element) -> (T)) -> Array<T> { }  
}
```

```
extension Future {  
    func map<T>(closure: (Result) -> (T)) -> Future<T> { }  
}
```

```
let foo: Optional<String>  
let bar: Optional<String> = foo.map { $0 + "!" }
```

```
let foo: Array<String>  
let bar: Array<String> = foo.map { $0 + "!" }
```

```
let foo: Future<String>  
let bar: Future<String> = foo.map { $0 + "!" }
```

SWIFT SERVER GROUP

- SHARED CODE
- BETTER ECOSYSTEM
- GOOD FOR EVERYONE

SUMMARY

- > IOS AND SERVER DEVELOPMENT IS **DIFFERENT**
- > SOLUTIONS FOR **IOS** DON'T WORK FOR **SERVER**
 - > **NIO IS AWESOME**

THANKS!

SITE

VAPOR.CODES

GITHUB

GITHUB.COM/VAPOR/VAPOR

TWITTER

TWITTER.COM/@CODEVAPOR

DISCORD

VAPOR.TEAM

NIO

GITHUB.COM/APPLE/SWIFT-NIO