



Get started with Node.js

MATF, Beograd, 10-10-2019

AGENDA

01 Web application architecture

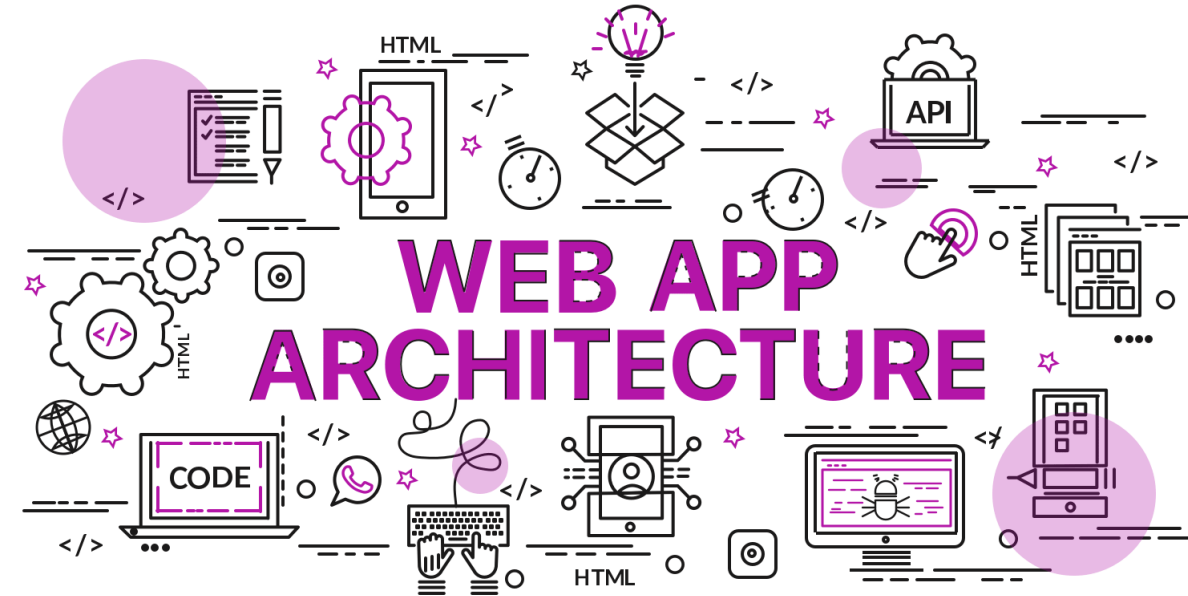
02 Communication & protocols

03 Node.js

04 Tools (npm, express ...)

Web application architecture

- What is web ?
other internet services?
- What is web application ?
- Other application types ?
web vs. desktop?
mobile applications
embedded applications
- How web application are written ?
what programming languages we can use to write web applications?



Web application architecture

- What is software architecture ?

Architecture is the fundamental organization of a system embodied in its components, their relationships to each other, and to the environment

Software architecture is the defining and structuring of a solution that meets technical and operational requirements.

Software architecture optimizes attributes involving a series of decisions, such as security, performance and manageability. These decisions ultimately impact application quality, maintenance, performance and overall success

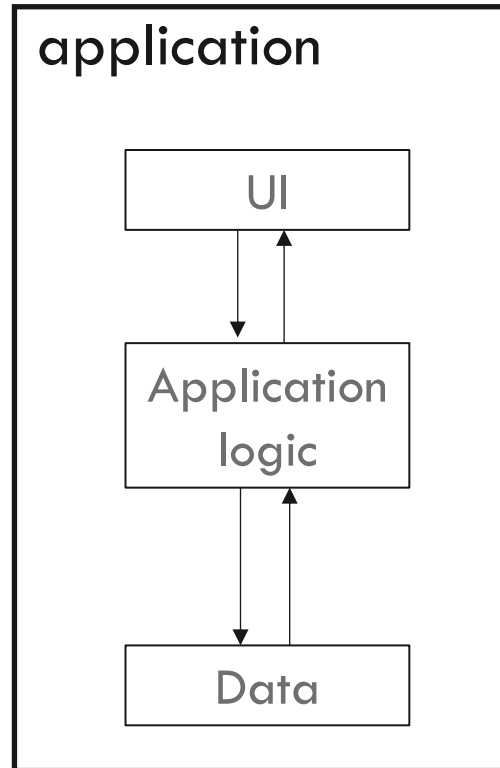
- Software architecture styles & patterns

Architecture pattern is a general, reusable solution to a commonly occurring problem in software architecture



Web application architecture

monolithic architecture style



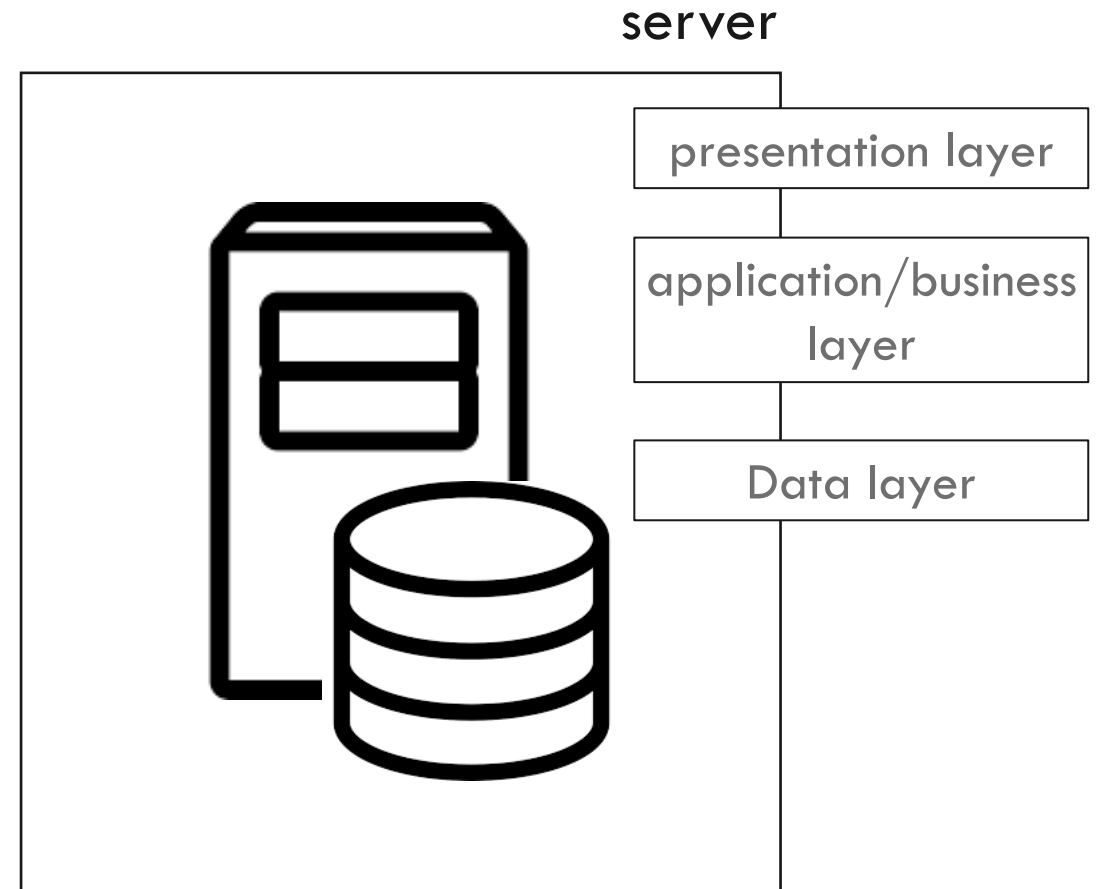
- Demo – example_01

Web application architecture

client – server (2-tier, 3-tier, n-tier)

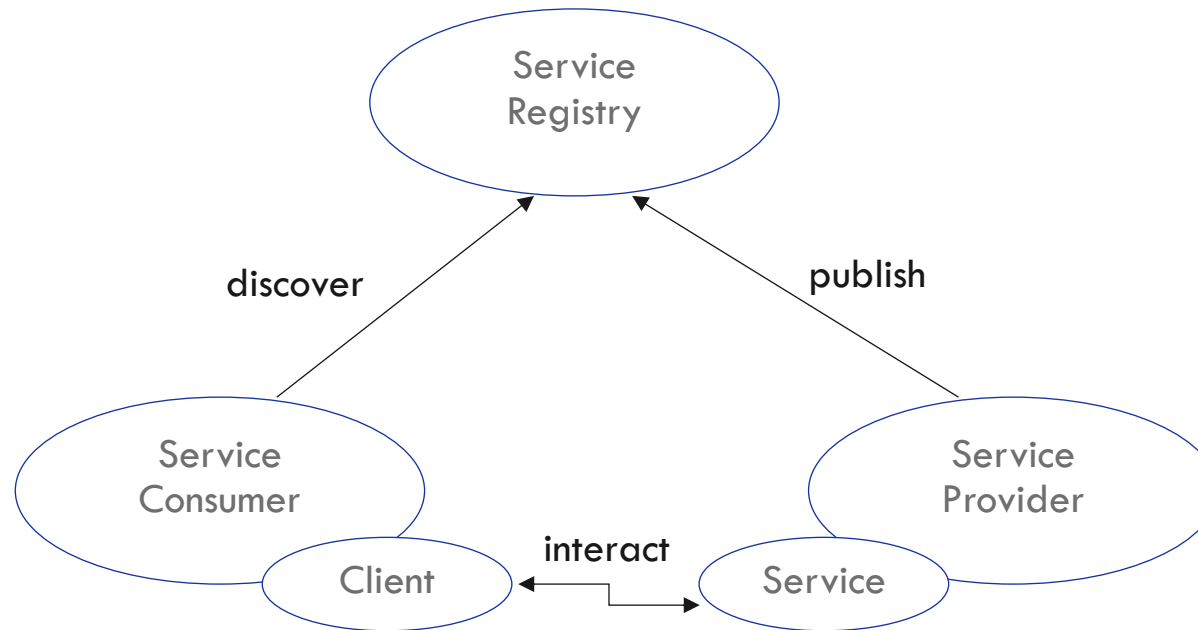


client



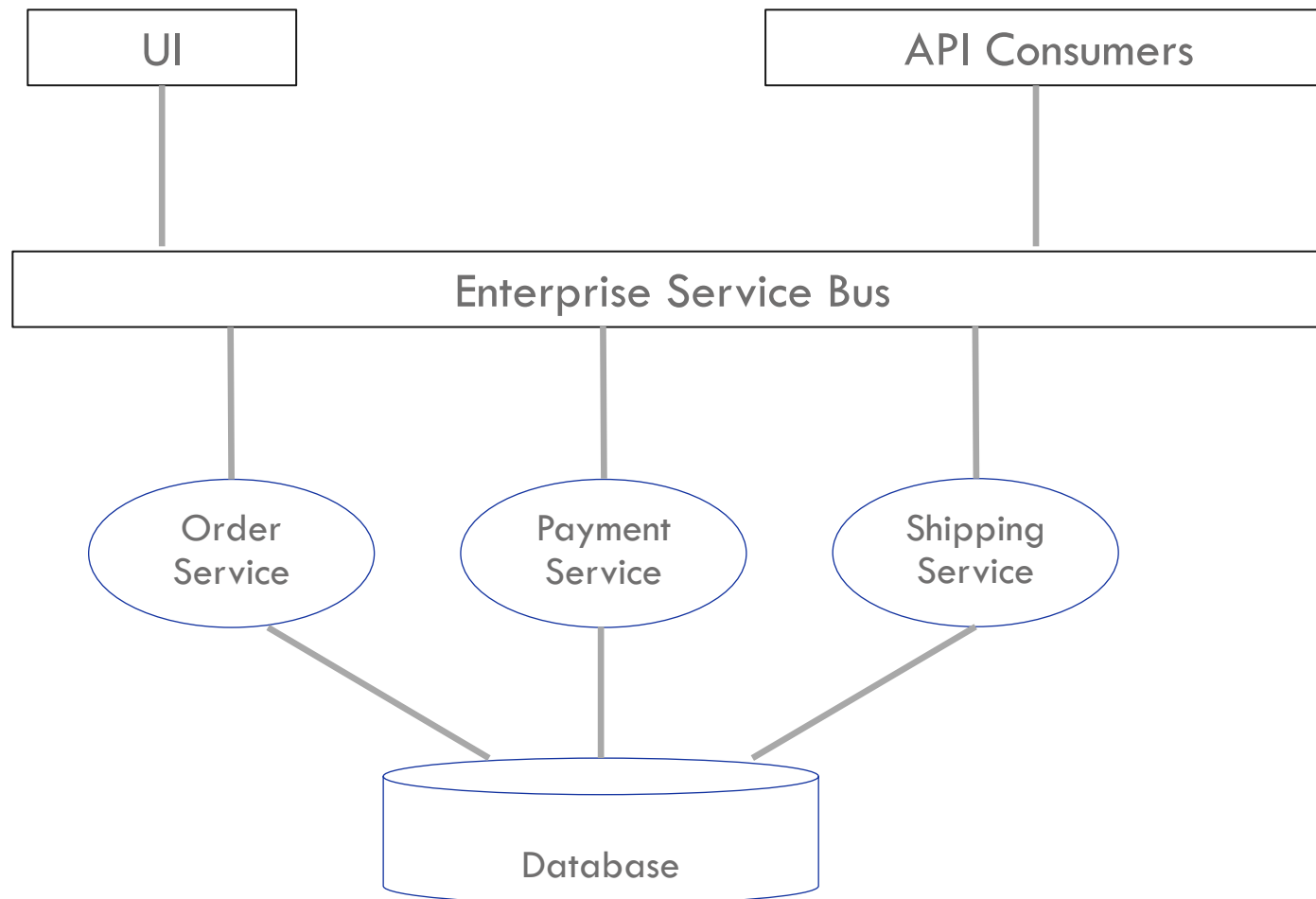
Web application architecture

Service-oriented architecture - SOA



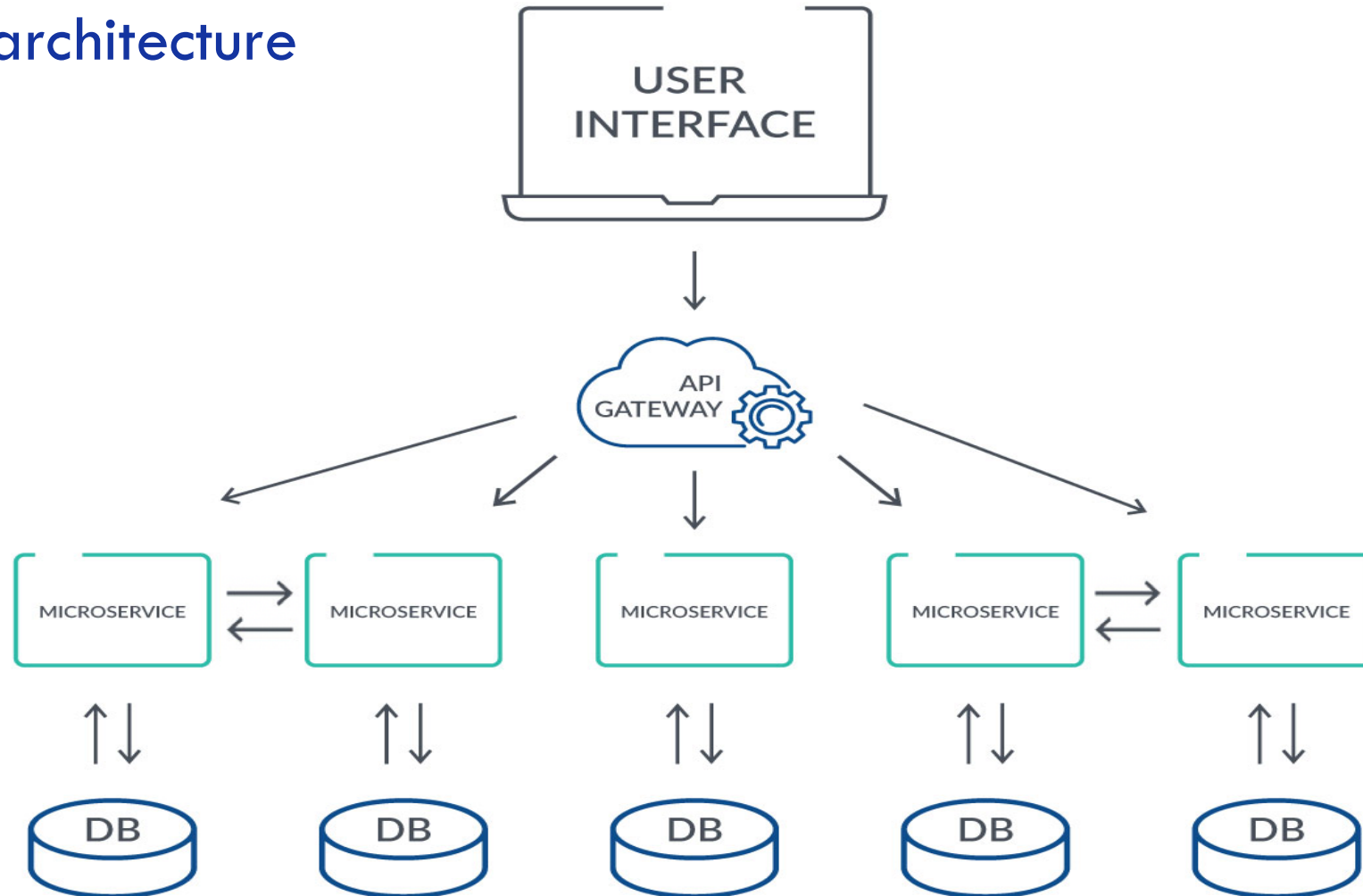
Web application architecture

Service-oriented architecture - SOA

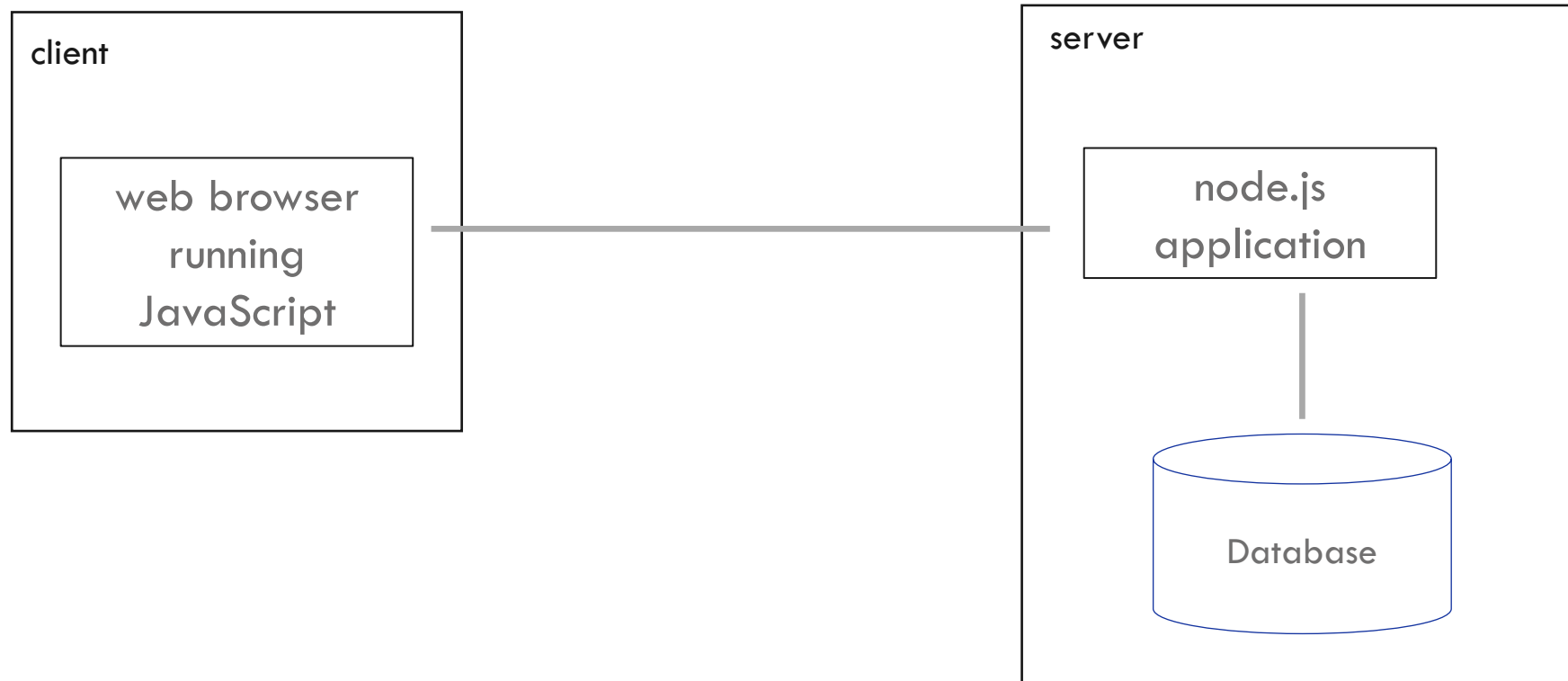


Web application architecture

Microservice architecture



Communication - protocols



Communication - protocols

- **Protocols**

http
tcp/ip
web sockets
soap

- **Data formats**

xml
JSON
binary (serialized)

- **REST**

- web services that conform to the REST architectural style, called RESTful Web services
- http methods used in REST: get, post, put, patch, delete



**Use in Technology
driven sectors**

REST

- Social Media
- Web Chat
- Mobile

SOAP

- Financial
- Telecommunication
- Payment Gateways

Communication - protocols

- **REST**

- It's all about resource
- Resource can be single or collection
- fetch resource using resource identifier
- **`http://your-api.com/crm/customer/{identifier}`**
- fetch resource collection
- **`http://your-api.com/crm/customers`**

- **Demo – example_02**

- **response - single resource**
- ```
{
 "id": "s0fj1h8df89a",
 "company": "MATF",
 "full-name": "Pera Peric",
}
```
- **response - collection**
- ```
[ {  
  "id": "s0fj1h8df89a",  
  "company": "MATF",  
  "full-name": "Pera Peric",  
},  
{  
  "id": "s0fj1h8df89a",  
  "company": "MATF",  
  "full-name": "Pera Peric",  
}]
```

Get started with Node.js

- What is node.js ?

node.js is an **open-source** server side runtime environment built on Chrome's **V8 JavaScript engine**. It provides an **event driven, non-blocking (asynchronous) I/O** and **cross-platform runtime** environment for building highly scalable server-side application using JavaScript.

part of MEAN stack

- Advantages

open source framework
lightweight – includes bare minimum modules
asynchronous by default
cross-platform – runs on windows, mac and linux

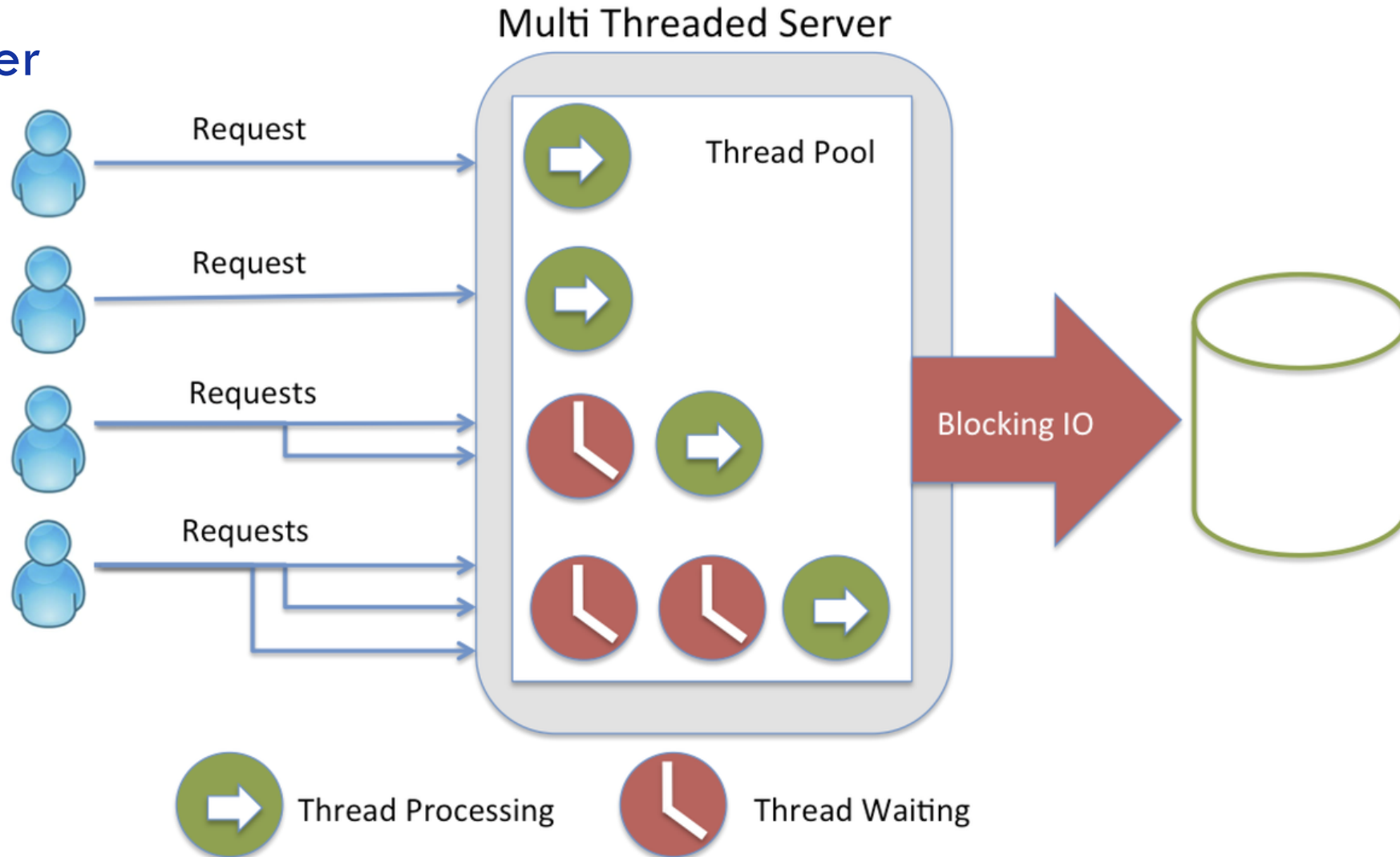
- Learning materials

[V8 JavaScript Engine](#)
[basics of understanding V8 engine](#)



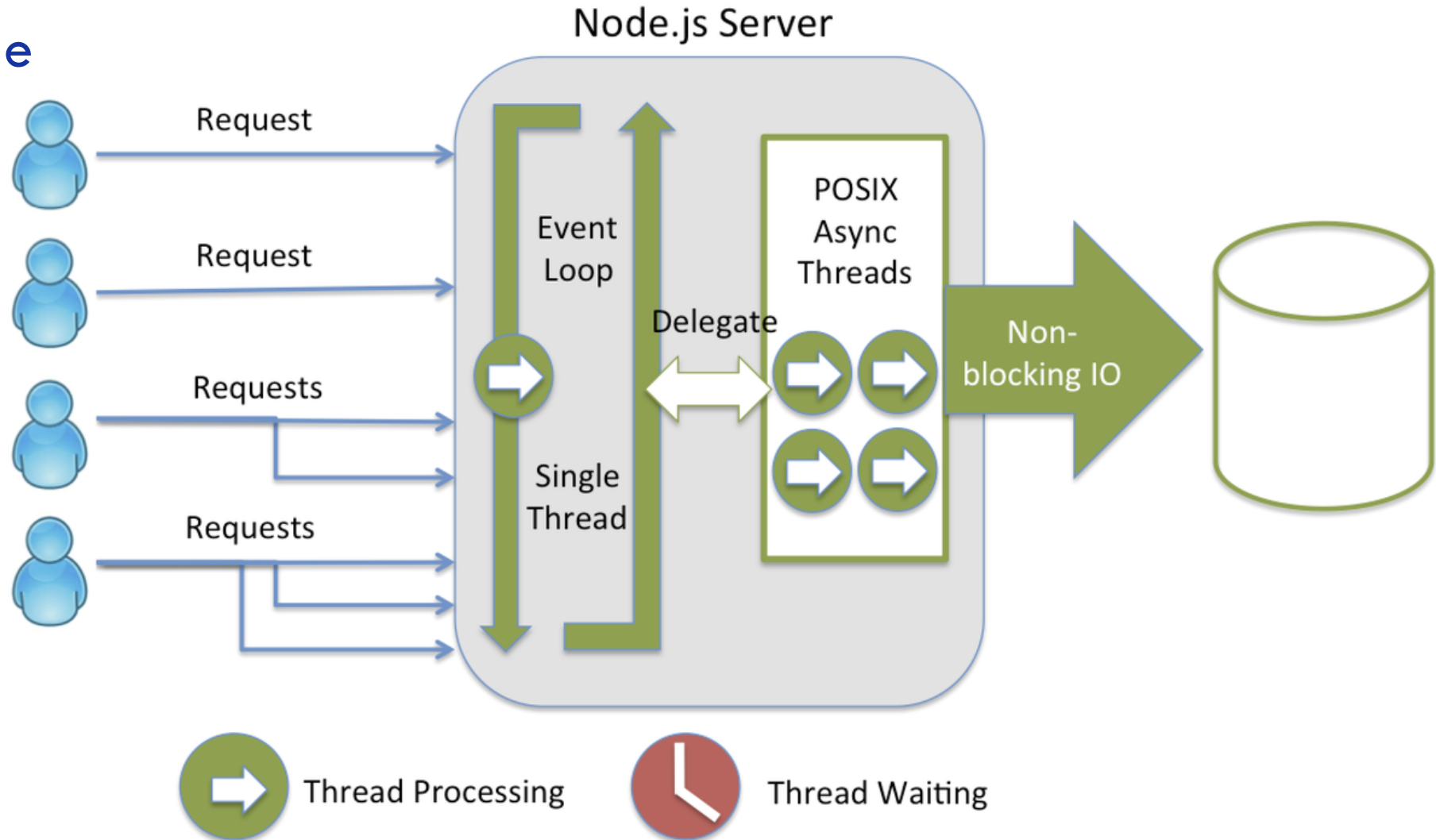
Get started with Node.js

web server



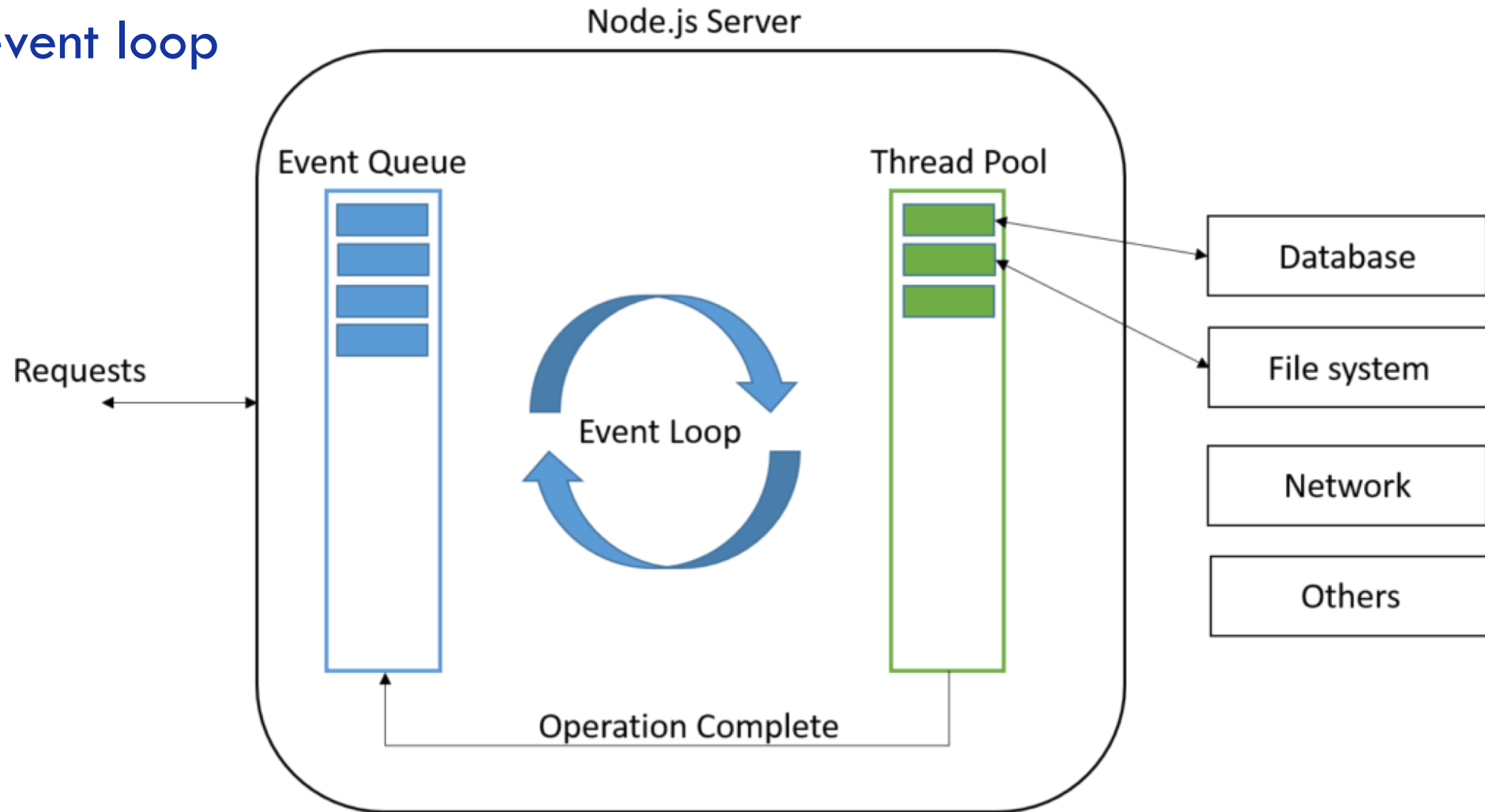
Get started with Node.js

async node



Get started with Node.js

node event loop



Get started with Node.js

- Running node.js application

- Async by default

sync vs. async
async I/O

demo – example_03

- Modules in node.js

core modules (fs, http, os, url, util ...)
local modules
third party modules

module.export()

demo example_04

The word "async" is written in a large, grey, sans-serif font. A thick blue arrow starts at the bottom of the 'y', goes up and to the right, then curves down to point at the 'n'. A horizontal blue line is positioned below the 'a' and 's'.

Tools - NPM

- Node Package Manager

npm is the world's largest software registry

module is any file or directory that can be loaded by node.js' require()

package is a file or directory that is described by a package.json

- Manage packages

npm commands:

- npm init

- npm install

- npm uninstall

- npm update

- npm publish

- npm unpublish

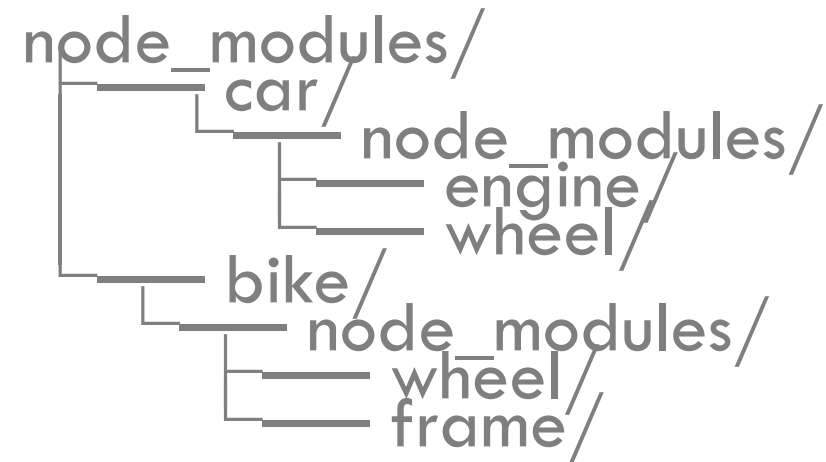
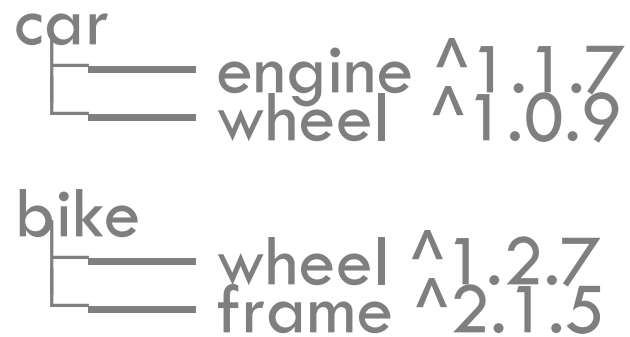
package.json

- Demo – example_05



Tools - NPM

- Package dependency



- **Yarn**
 - npm alternative
 - developed by Facebook (oss)
 - compatible with npm
 - using npm registry

- Demo – example_05



QUESTIONS ?

