

Mecanismo de busca com Node.js e MongoDB

Seminário Alcides Maya 2020

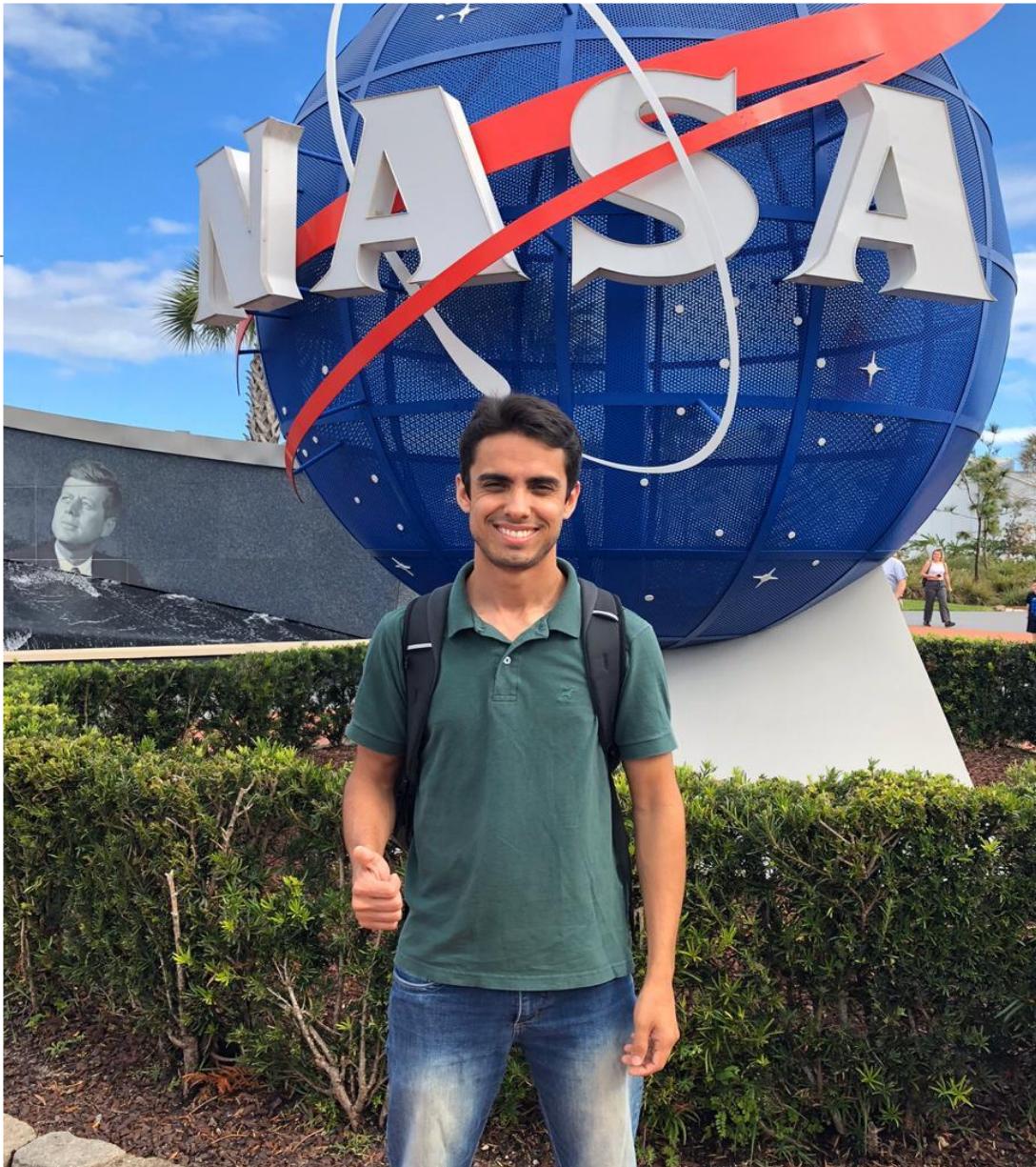
Luiz Duarte

Ajudo times e empresas a atingirem o seu máximo potencial em negócios de tecnologia e inovação.

Desde 2006 no mercado de TI, atuando em empresas públicas, privadas, startups e grandes corporações bilionárias.

14
ANOS

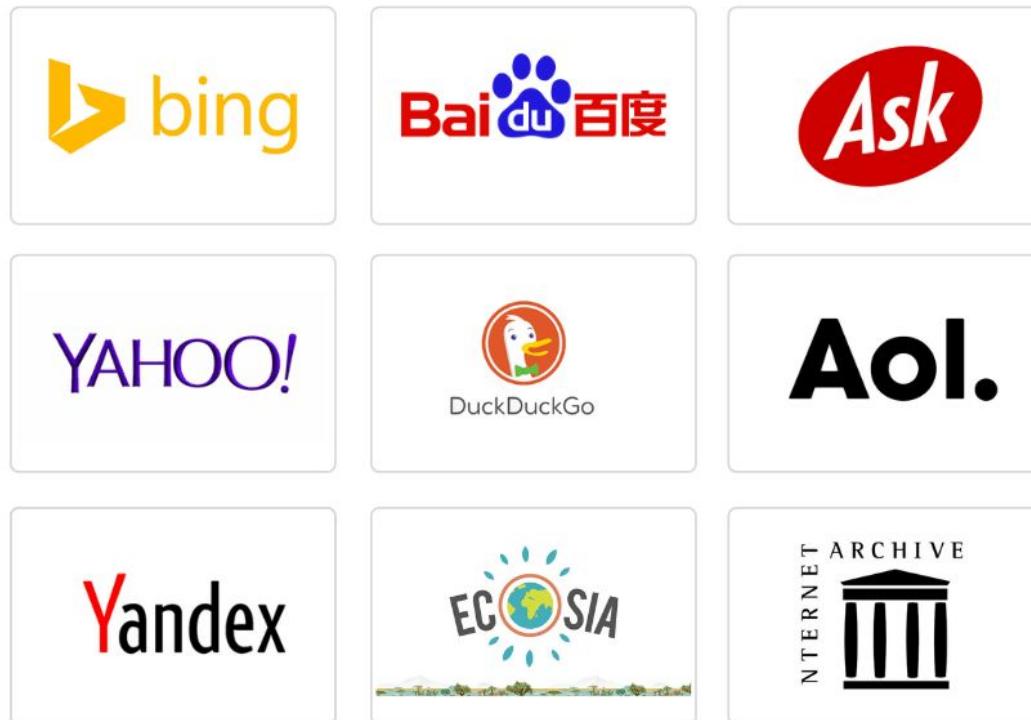
**PROGRAMADOR
LÍDER TÉCNICO
AGILE COACH
ESCRITOR
EMPREENDEDOR
PROFESSOR**



O que vamos ver?

- Mecanismo de busca
- MongoDB
- Node.js
- Indo Além

Mecanismo de Busca



2010

AS MELHORES OFERTAS DE VEÍCULOS EM UM SÓ LUGAR!

=buscaacelerada

CARROS MOTOS CAMINHÕES NÁUTICOS

QUE CARRO DESEJA BUSCAR? **BUSCAR**

▼ BUSCA AVANÇADA

Por quê o Busca acelerada é diferente?

2010

AS MELHORES OFERTAS DE VEÍCULOS EM UM SÓ LUGAR!

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SÓ FAMOSOS

Todas as notícias dos famosos num só lugar! Experimente ;)

ex.: Anitta

BUSCAR

SEJA BUSCAR?

BUSCAR

▼ BUSCA AVANÇADA

Por quê o Busca acelerada é diferente?

QUEM SOMOS EVENTOS MATERIAIS AVANÇADOS CONTATO



ARQUITETURA ENGENHARIA CIVIL TECNOLOGIA ESPECIALISTAS



2010



AS MELHORES OFERTAS DE VEÍCULOS EM UM SÓ LUGAR!

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Todas as notícias dos famosos num só lugar! Experimente ;)

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BUSCAR

SEJA BUSCAR?

▼ BUSCA AVANÇADA

Por quê o Busca acelerado?

QUEM SOMOS EVENTOS MATERIAIS AVANÇADOS CONTATO



ARQUITETURA ENGENHARIA CIVIL TECNOLOGIA ESPECIALISTAS



Quer garantir a assertividade
do seu planejamento?

EM E-BOOK, ANDRÉ
QUINDERE APRESENTA
METODOLOGIA PARA
PLANNER

ANDRÉ QUINDERE x 25/11/2019



CIDADE MATARAZZO: OBRA
DO COMPLEXO PRIMA PELA
ENGENHARIA

JULIANA NAKAMURA x 25/11/2019

CENTRALIZAR DECISÕES PREJUDICA
INOVAÇÃO NA CONSTRUÇÃO

BRUNO LOTURCO x 05/12/2019



HOME A EMPRESA PRODUTOS CURSOS

ÁREA DO CLIENTE
usuário senha OK



CONTATO



A informação segura é o
nossa negócio desde 2000.



Aviso Coronavirus
1) Precisamos prever fazendo nossa parte com
responsabilidade social.

Novo eSocial 2020
2) Curso com 6 meses de atualização garantida e
mentoria!

Cálculo Integrado ICMS-ST
3) Conheça essa nova ferramenta que irá mudar a sua
rotina de trabalho

Teste nosso produto
4) Nossa equipe de consultoria conta com os
melhores profissionais do mercado para sanar suas
dúvidas

COLLEÇÕES

TRABALHISTA



Legislação Trabalhista, direitos e deveres
admissão e demissão de empregados, CLT,
Previdência Social, Benefícios, Custojo,
Referência, Previdenciária, FGTS, GEIP/SEEP

CONTÁBIL



Contabilidade, Legislação societária, CNPJ,
IRPJ, CSLL, PIS/PASEP e COFINS, SIMPLES
Nacional, MEI, Lucro Presumido, Lucro Real,
Referência, Declarações Estaduais e Municipais,
Referências de IRPF e Contribuições Federais

FISCAL



ICMS, IPI e ISSQN, Escrituração de livros
fiscais, SPED Fiscal, Notas Fiscais, emissão de
guias, Declarações Estaduais e Municipais,
transporte de mercadorias e Simples Nacional

Por que?

- Funcionalidade de busca
- Criar um negócio digital

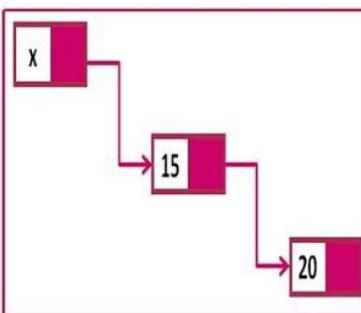
Antes de começar...



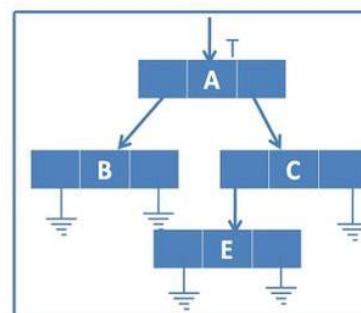
Antes de começar...



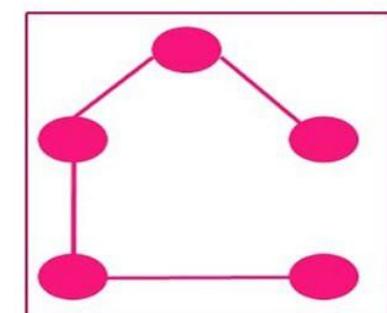
Sorting



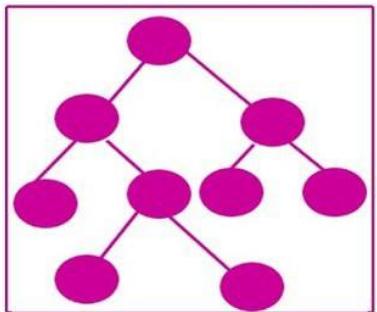
Link list



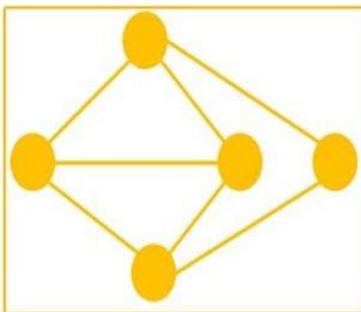
list



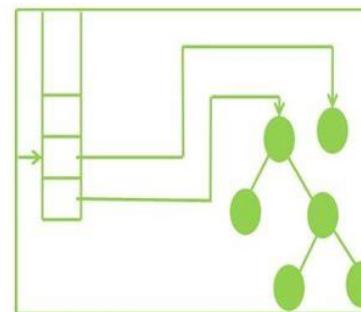
spanning tree



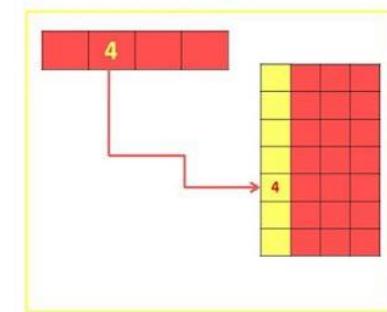
Tree



Graph



Stack



Hashing

By...navinkumardhoprephotography.com

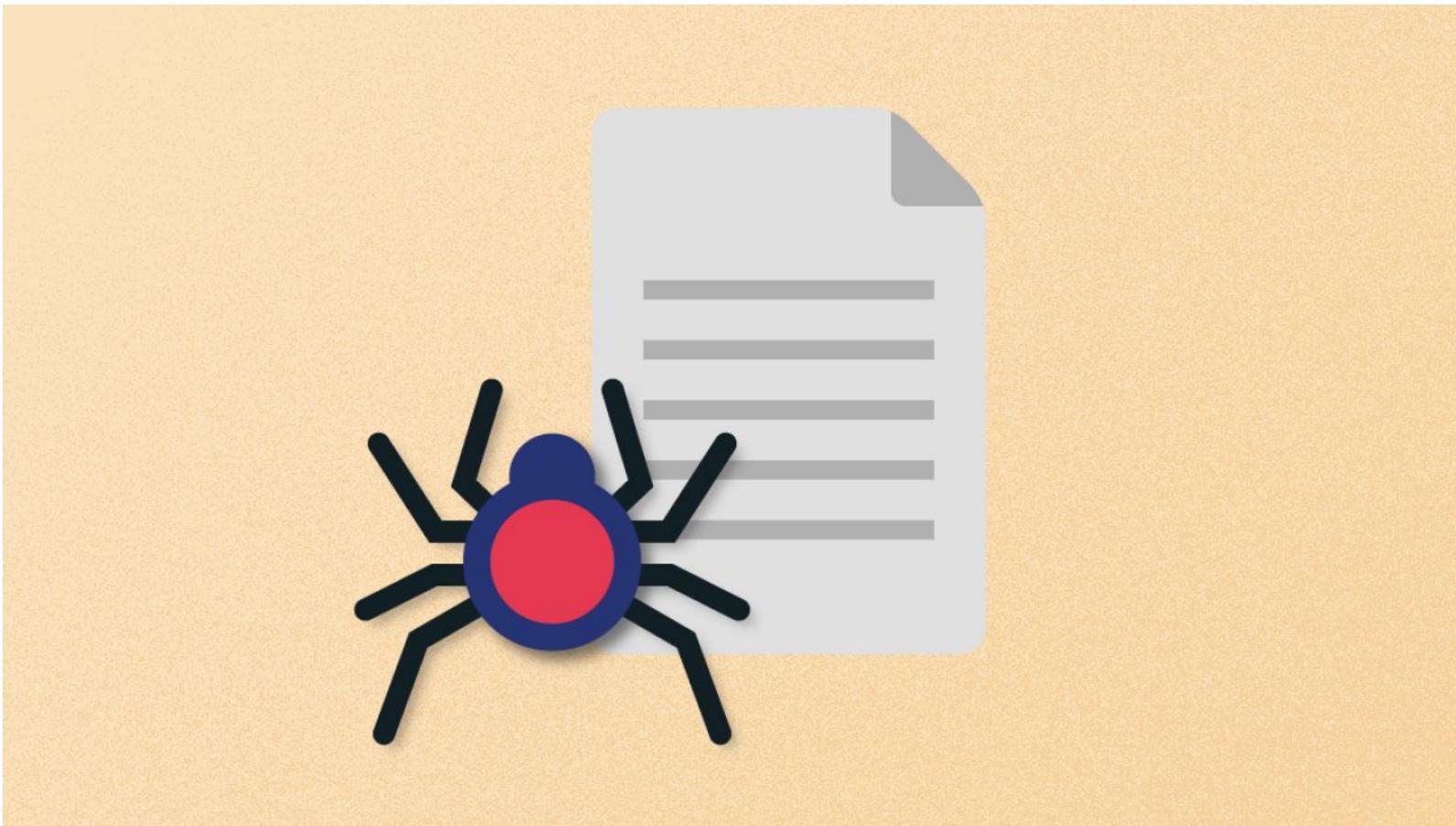
O que vamos precisar?



Fontes de Dados



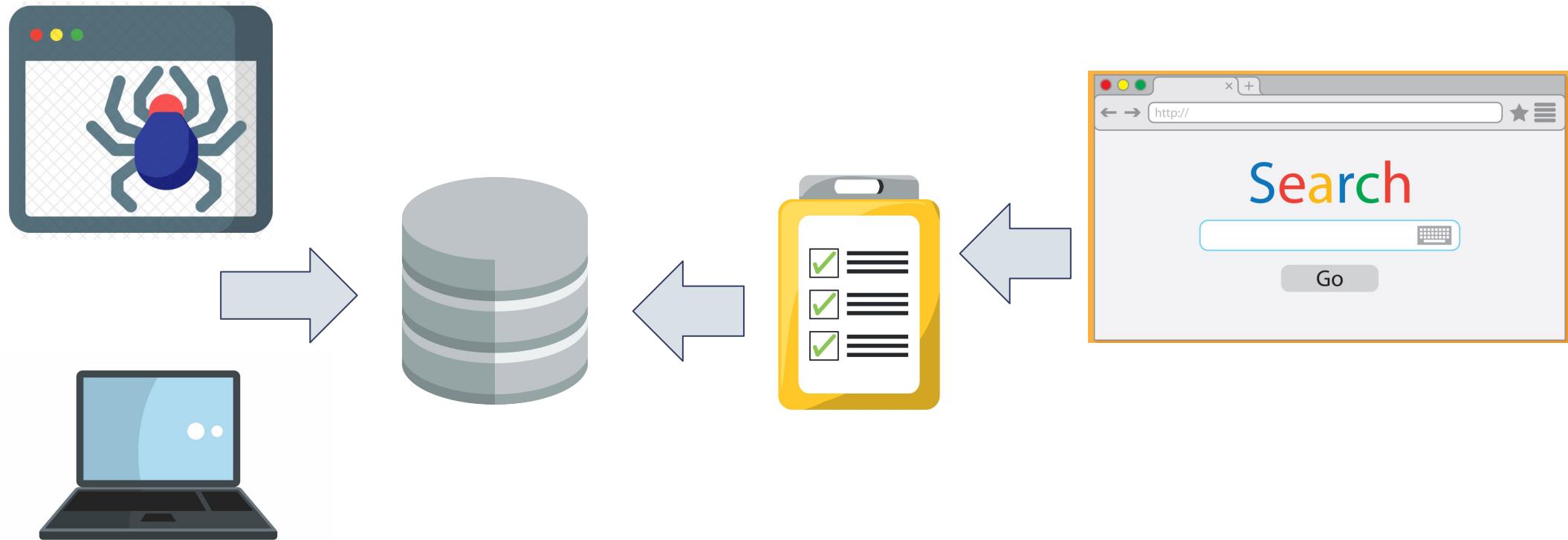
Fontes de Dados



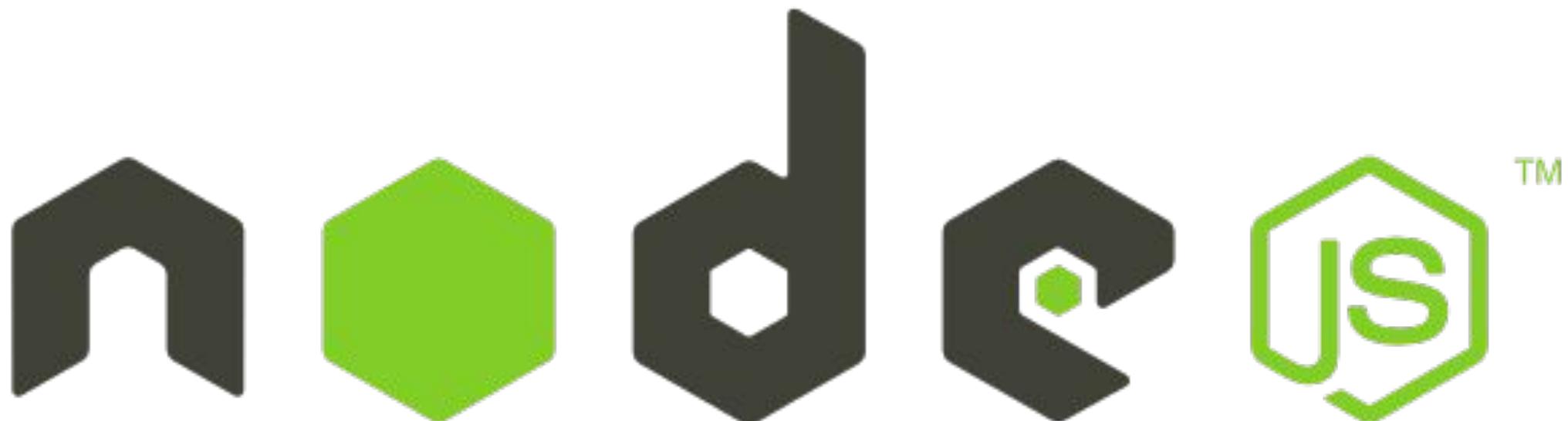
Índice de Busca

INDEX	TABLE
E00127	Tyler
E01234	John
E03033	George
E04242	Adam
E10001	David
E10297	Rich
E16398	Nathan
E21437	Richard
E27002	David
E41298	Tim
E43128	Kim
E63535	Timothy
	Bennett
	Rappi
	Woltman
	Smith
	McClellan
	Holcomb
	Adams
	Potter
	Motsinger
	Sampair
	Arlich
	Grove
	E10297
	E21437
	E00127
	E63535
	E01234
	E41298
	E43128
	E27002
	E03033
	E10001
	E16398

Arquitetura



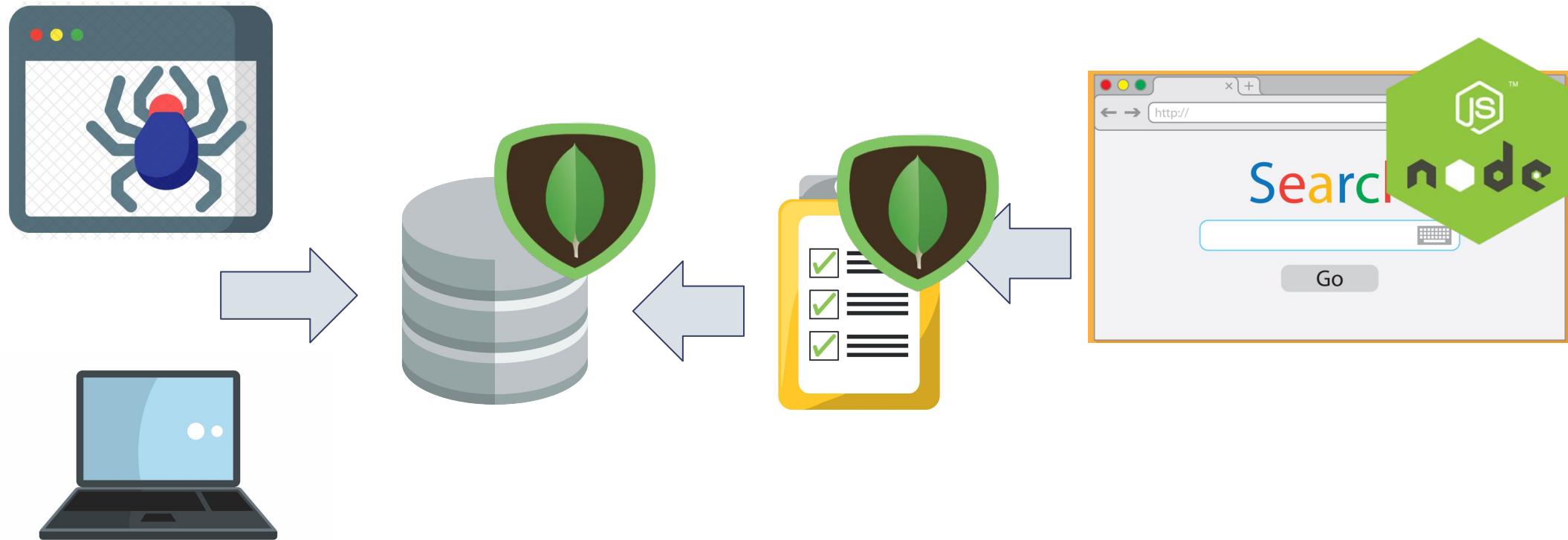
Aplicação



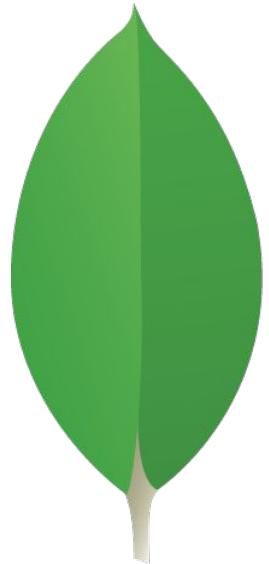
Banco de Dados/Índice



Arquitetura

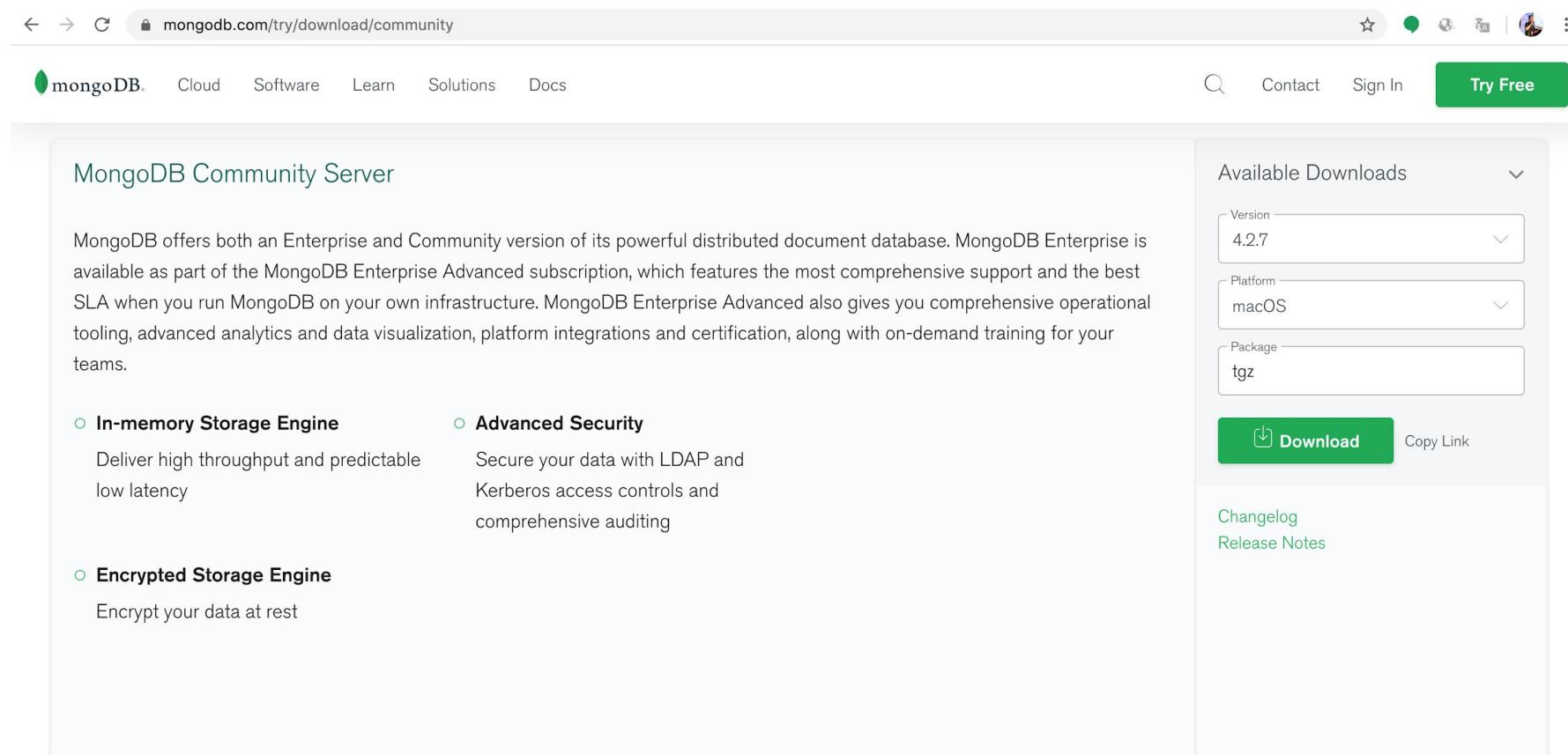


Primeiro Passo



mongoDB®

Baixando e Instalando

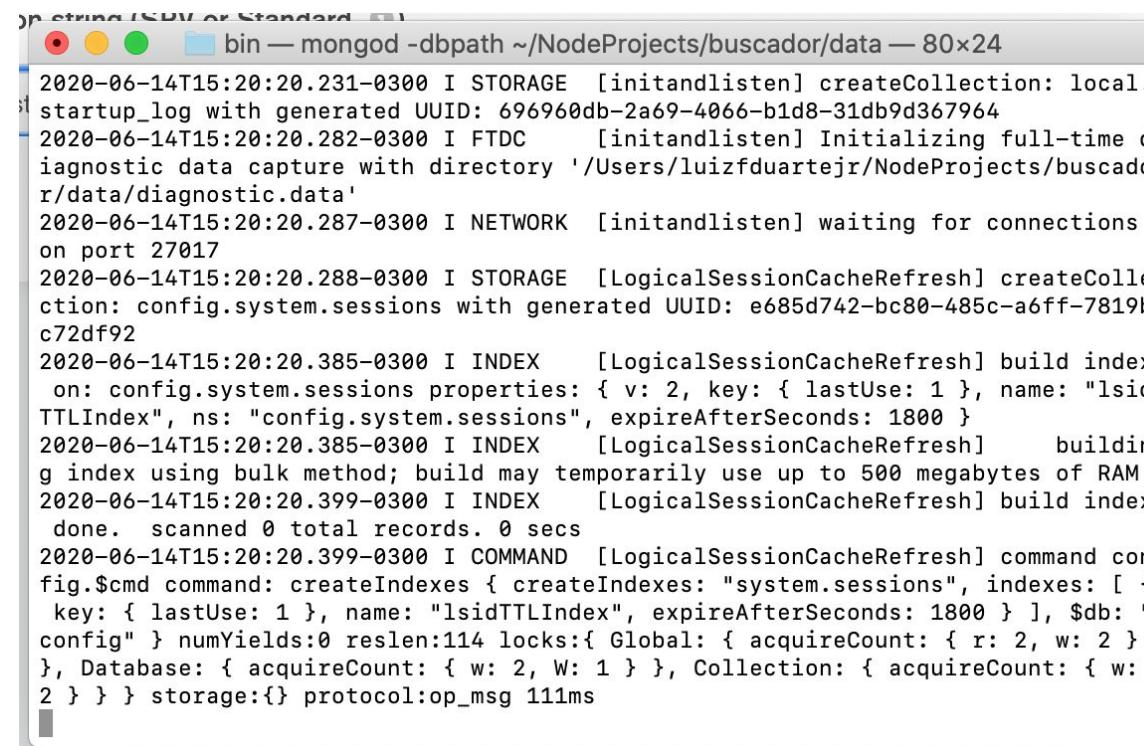


The screenshot shows the MongoDB Community Server download page. At the top, there's a navigation bar with links for Cloud, Software, Learn, Solutions, Docs, Contact, Sign In, and a prominent green "Try Free" button. Below the navigation, the title "MongoDB Community Server" is displayed. A main text block explains that MongoDB offers both Enterprise and Community versions, highlighting the Enterprise Advanced subscription's features like comprehensive support and operational tooling. To the right, a sidebar titled "Available Downloads" allows users to select a version (4.2.7), platform (macOS), and package type (tgz). It includes a large green "Download" button and links for "Changelog" and "Release Notes". On the left, there are three sections: "In-memory Storage Engine" (delivering high throughput and low latency), "Advanced Security" (securing data with LDAP and Kerberos), and "Encrypted Storage Engine" (encrypting data at rest).

<https://www.mongodb.com/try/download/community>

Subindo Servidor

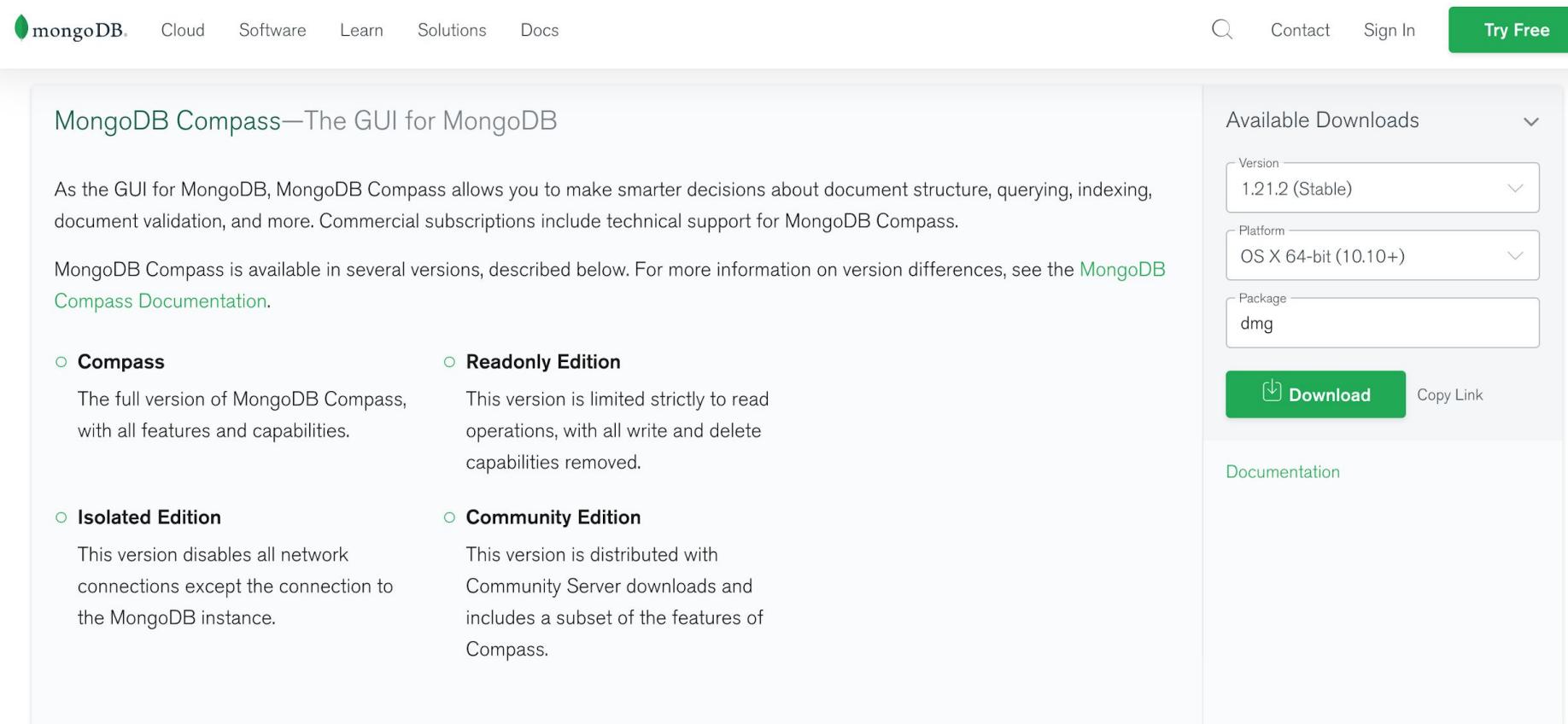
- mongod --dbpath pasta-do-projeto/data



A screenshot of a terminal window titled "bin — mongod --dbpath ~/NodeProjects/buscador/data — 80x24". The window displays the startup logs of a MongoDB instance. The logs show the database creating collections, initializing full-time diagnostic data capture, and waiting for connections on port 27017. It also shows the creation of indexes for the "config.system.sessions" collection and the execution of a command to create indexes on the "system.sessions" collection.

```
2020-06-14T15:20:20.231-0300 I STORAGE [initandlisten] createCollection: local.startup_log with generated UUID: 696960db-2a69-4066-b1d8-31db9d367964
2020-06-14T15:20:20.282-0300 I FTDC [initandlisten] Initializing full-time diagnostic data capture with directory '/Users/luizfduartejr/NodeProjects/buscador/data/diagnostic.data'
2020-06-14T15:20:20.287-0300 I NETWORK [initandlisten] waiting for connections on port 27017
2020-06-14T15:20:20.288-0300 I STORAGE [LogicalSessionCacheRefresh] createCollection: config.system.sessions with generated UUID: e685d742-bc80-485c-a6ff-781bc72df92
2020-06-14T15:20:20.385-0300 I INDEX [LogicalSessionCacheRefresh] build index on: config.system.sessions properties: { v: 2, key: { lastUse: 1 }, name: "lsid TTLIndex", ns: "config.system.sessions", expireAfterSeconds: 1800 }
2020-06-14T15:20:20.385-0300 I INDEX [LogicalSessionCacheRefresh] building index using bulk method; build may temporarily use up to 500 megabytes of RAM
2020-06-14T15:20:20.399-0300 I INDEX [LogicalSessionCacheRefresh] build index done. scanned 0 total records. 0 secs
2020-06-14T15:20:20.399-0300 I COMMAND [LogicalSessionCacheRefresh] command config.$cmd command: createIndexes { createIndexes: "system.sessions", indexes: [ { key: { lastUse: 1 }, name: "lsidTTLIndex", expireAfterSeconds: 1800 } ], $db: "config" } numYields:0 reslen:114 locks:{ Global: { acquireCount: { r: 2, w: 2 } }, Database: { acquireCount: { w: 2, W: 1 } }, Collection: { acquireCount: { w: 2 } } } storage:{} protocol:op_msg 111ms
```

GUI Client



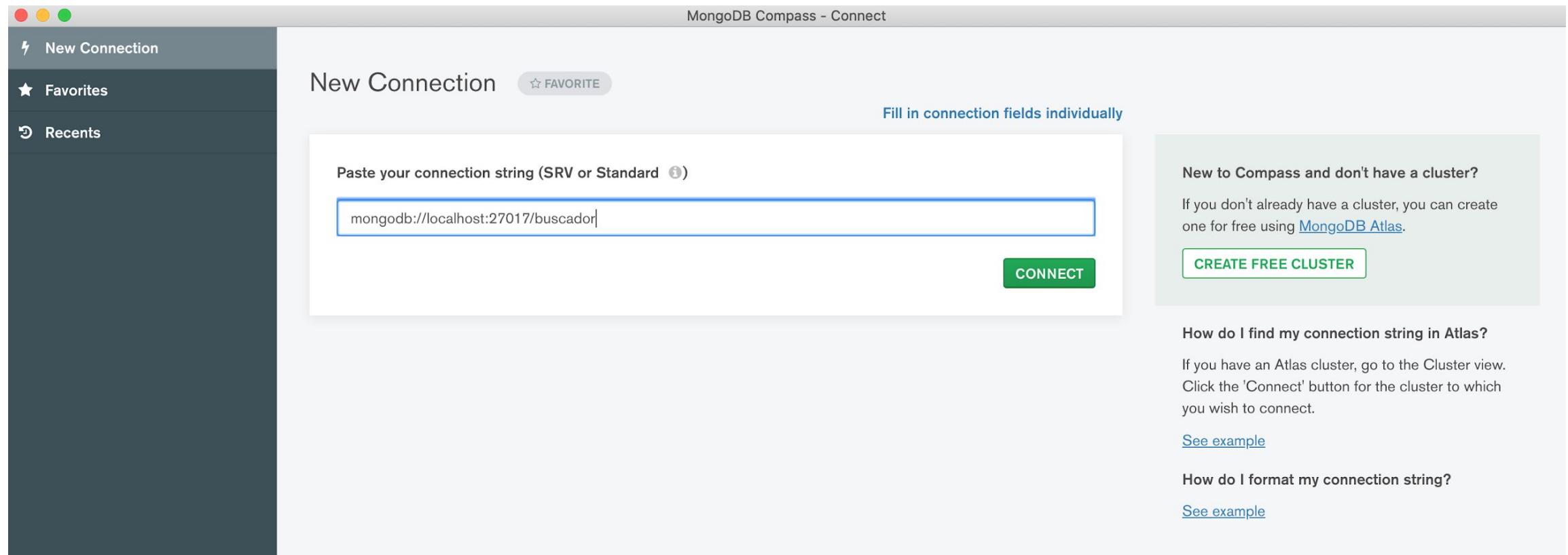
The screenshot shows the MongoDB Compass download page. At the top, there's a navigation bar with the MongoDB logo, Cloud, Software, Learn, Solutions, Docs, a search icon, Contact, Sign In, and a prominent green "Try Free" button. Below the navigation, the title "MongoDB Compass—The GUI for MongoDB" is displayed. A brief description follows: "As the GUI for MongoDB, MongoDB Compass allows you to make smarter decisions about document structure, querying, indexing, document validation, and more. Commercial subscriptions include technical support for MongoDB Compass." It then describes the availability of MongoDB Compass in several versions: "MongoDB Compass is available in several versions, described below. For more information on version differences, see the [MongoDB Compass Documentation](#)". The page lists four editions:

- Compass**: The full version of MongoDB Compass, with all features and capabilities.
- Readonly Edition**: This version is limited strictly to read operations, with all write and delete capabilities removed.
- Isolated Edition**: This version disables all network connections except the connection to the MongoDB instance.
- Community Edition**: This version is distributed with Community Server downloads and includes a subset of the features of Compass.

On the right side, a sidebar titled "Available Downloads" is open, showing dropdown menus for "Version" (set to 1.21.2 (Stable)), "Platform" (set to OS X 64-bit (10.10+)), and "Package" (set to dmg). Below these is a large green "Download" button with a download icon, and a "Copy Link" link next to it. At the bottom of the sidebar, there's a link to "Documentation".

<https://www.mongodb.com/try/download/compass>

Conectando no Servidor



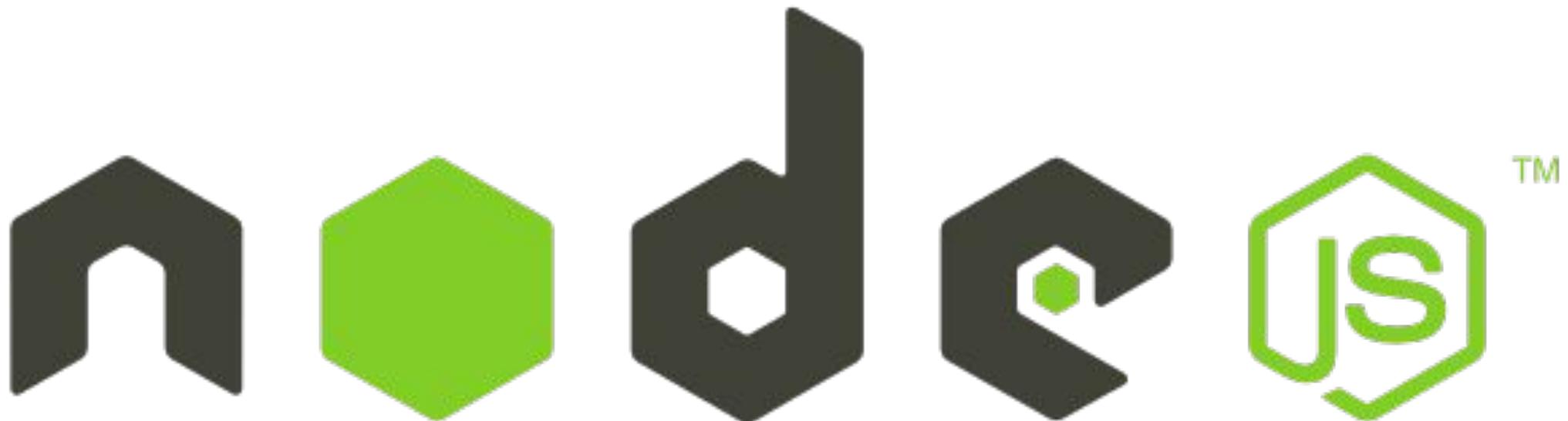
Dados Indexáveis

```
> _id: ObjectId("573a1390f29313caabcd4135")
  plot: "Three men hammer on an anvil and pass a bottle of beer around."
> genres: Array
  runtime: 1
< cast: Array
  0: "Charles Kayser"
  1: "John Ott"
  num_mflix_comments: 1
  title: "Blacksmith Scene"
  fullplot: "A stationary camera looks at a large anvil with a blacksmith behind it..."
< countries: Array
  0: "USA"
  released: 1893-05-09T00:00:00.000+00:00
< directors: Array
  0: "William K.L. Dickson"
  rated: "UNRATED"
> awards: Object
  lastupdated: "2015-08-26 00:03:50.133000000"
  year: 1893
> imdb: Object
  type: "movie"
> tomatoes: Object
```

Simplificação de Dados



Camada de Aplicação



Instalando o Node.js



Downloads

Latest LTS Version: 12.18.0 (includes npm 6.14.4)

Download the Node.js source code or a pre-built installer for your platform, and start developing today.

LTS Recommended For Most Users	Current Latest Features
 Windows Installer <small>node-v12.18.0-x86.msi</small>	 macOS Installer <small>node-v12.18.0.pkg</small>
Windows Installer (.msi)	32-bit
Windows Binary (.zip)	64-bit
macOS Installer (.pkg)	32-bit
macOS Binary (.tar.gz)	64-bit
Linux Binaries (x64)	64-bit
Linux Binaries (ARM)	ARMv7
Source Code	ARMv8
	<small>node-v12.18.0.tar.gz</small>

<https://nodejs.org/en/download/>

Instalando o VS Code

The screenshot shows the top navigation bar of the Visual Studio Code website. It includes the logo, links for Docs, Updates, Blog, API, Extensions, and FAQ, a search bar labeled "Search Docs", and a prominent blue "Download" button. A notification banner at the bottom states "Version 1.46 is now available! Read about the new features and fixes from May." with a close button.

Download Visual Studio Code

Free and built on open source. Integrated Git, debugging and extensions.



[Windows](#)
Windows 7, 8, 10



[.deb](#) [.rpm](#)
Debian, Ubuntu Red Hat, Fedora, SUSE



[Mac](#)
macOS 10.10+

User Installer 64 bit 32 bit
System Installer 64 bit 32 bit
.zip 64 bit 32 bit

.deb 64 bit
.rpm 64 bit
.tar.gz 64 bit

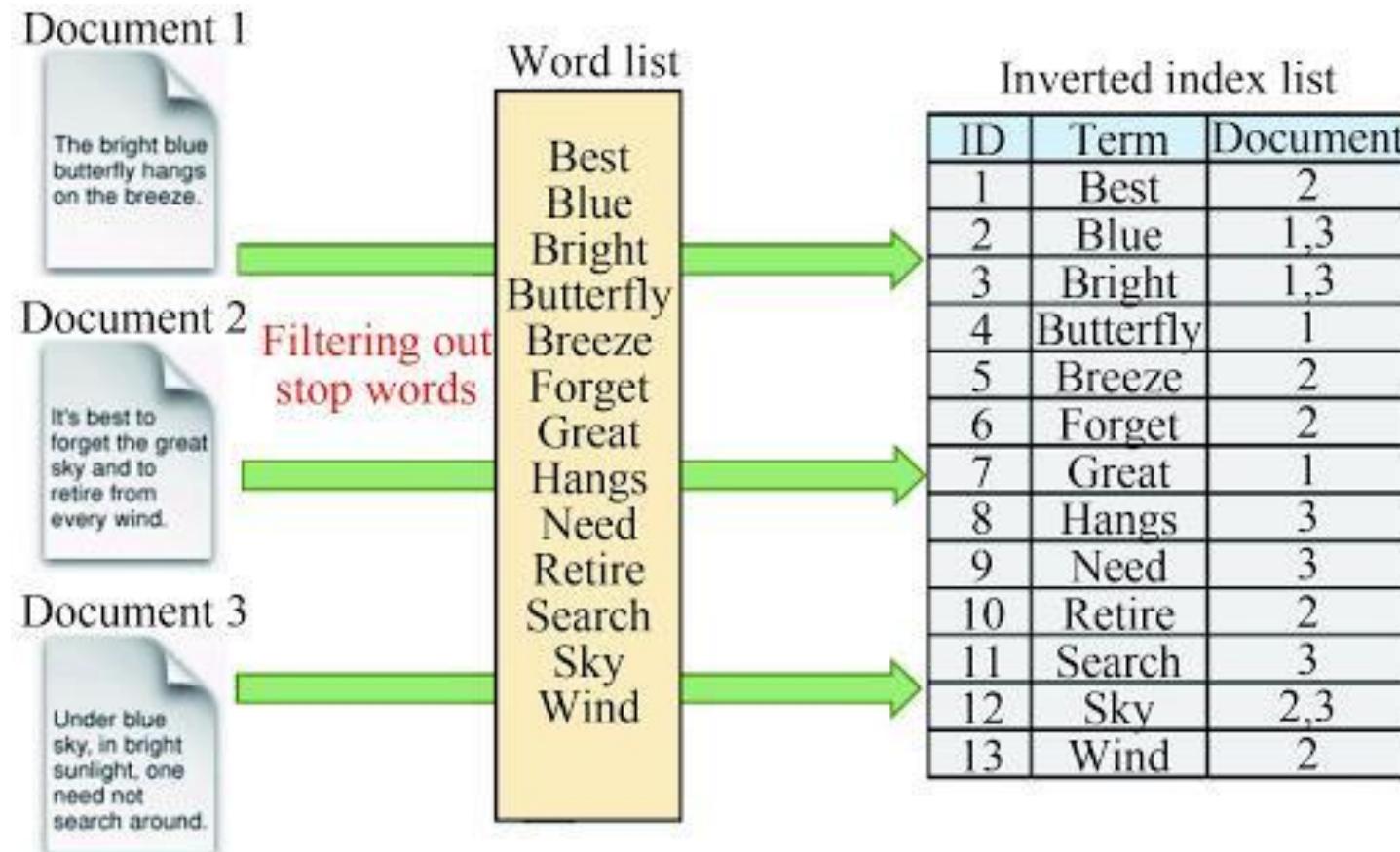
[Snap Store](#)

<https://code.visualstudio.com/download>

Simplificação de Dados

```
JS simplificacao.js > ...
1  //simplificacao.js
2  > function generateTags(movie){...
20 }
21
22 > function updateMovies(movies){...
28 }
29
30 > function findAllMovies(){...
32 }
33
34 const mongoClient = require('mongodb').MongoClient;
35 mongoClient.connect('mongodb://localhost:27017/netflix')
36 >   .then(conn => {
39   })
40   .then(arr => updateMovies(arr))
41   .catch(err => console.log(err));
42
43 module.exports = {}
```

Índice Invertido



Criando o índice

MongoDB Compass - localhost:27017/netflix.movies2

Local

3 DBS 1 COLLECTIONS C

HOST localhost:27017

CLUSTER Standalone

EDITION MongoDB 4.0.10 Community

Filter your data

admin

config

local

netflix

movies

movies2

...

netflix.movies2

Indexes

netflix.movies2

Documents Aggregations Schema Explain Plan Indexes Validation

CREATE INDEX

Name and Definition	Type	Size	Usage	Properties	Drop
id	REGULAR ⓘ	225.3 KB	1 since Sun Jun 14 2020	UNIQUE ⓘ	
tags	REGULAR ⓘ	2.6 MB	0 since Sun Jun 14 2020		✖

DOCUMENTS 23.5k TOTAL SIZE 33.7MB AVG. SIZE 1.5KB INDEXES 2 TOTAL SIZE 2.7MB AVG. SIZE 1.4MB

Testando o índice

The screenshot shows the MongoDB Compass interface connected to a Local host at port 27017. The sidebar on the left lists databases (admin, config, local, netflix, movies, movies2) and collections (movies2). The main area displays the netflix.movies2 collection with the following details:

- Documents: 23.5k
- Total Size: 33.7MB
- Avg. Size: 1.5KB
- Indexes: 2
- Total Size: 2.7MB
- Avg. Size: 1.4MB

A filter is applied: {tags: {\$in: ["WESTERN", "WATER"]}}. The results show two documents:

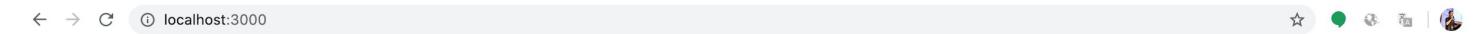
```
_id: ObjectId("573a1394f29313caabce0553")
plot: "On a small island in the South Pacific, the Navy's P.R. department is ..."
> genres: Array
> runtime: 103
> rated: "APPROVED"
> cast: Array
> title: "Hell and High Water"
> fullplot: "A privately-financed scientist and his colleagues hire an ex-Navy offi..."
> released: 1954-02-06T00:00:00.000+00:00
> directors: Array
> awards: Object
> lastupdated: "2015-08-18 00:29:17.377000000"
> year: 1954
> imdb: Object
> countries: Array
> type: "movie"
> tomatoes: Object
> tags: Array

_id: ObjectId("573a1394f29313caabce0554")
plot: "On a small island in the South Pacific, the Navy's P.R. department is ..."
> genres: Array
> runtime: 107
> rated: "APPROVED"
> cast: Array
> num_mflix_comments: 1
> title: "Don't Go Near the Water"
> fullplot: "On a small island in the South Pacific, the Navy's P.R. department is ..."
> released: 1957-12-01T00:00:00.000+00:00
> directors: Array
> awards: Object
> lastupdated: "2015-08-09 00:34:07.617000000"
> year: 1957
> imdb: Object
> countries: Array
> type: "movie"
> tomatoes: Object
> tags: Array
```

Criando a aplicação

- npm install -g express-generator
- express -e app
- cd app
- npm install
- npm start
- localhost:3000

Criando a aplicação



Express

Welcome to Express

Estilizando com Bootstrap

B Home Documentation Examples Icons Themes Expo Blog v4.5 ▾  Download

Build fast, responsive sites with Bootstrap

Quickly design and customize responsive mobile-first sites with Bootstrap, the world's most popular front-end open source toolkit, featuring Sass variables and mixins, responsive grid system, extensive prebuilt components, and powerful JavaScript plugins.



[Get started](#) [Download](#)

Currently v4.5.0

<https://getbootstrap.com/docs/4.5/getting-started/download/>

views/index.ejs

```
<!doctype html>
<html lang="en">
  <head>
    <!-- Required meta tags -->
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
    <title><%= title %></title>
    <!-- Bootstrap CSS -->
    <link rel="stylesheet"
      href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.0/css/bootstrap.min.css">
  </head>
```

views/index.ejs

```
<!-- jQuery first, then Popper.js, then Bootstrap JS -->
<script src="https://code.jquery.com/jquery-3.5.1.slim.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/popper.js@1.16.0/dist/umd/popper.min.js"></script>
<script src="https://stackpath.bootstrapcdn.com/bootstrap/4.5.0/js/bootstrap.min.js"></script>
</body>
</html>
```

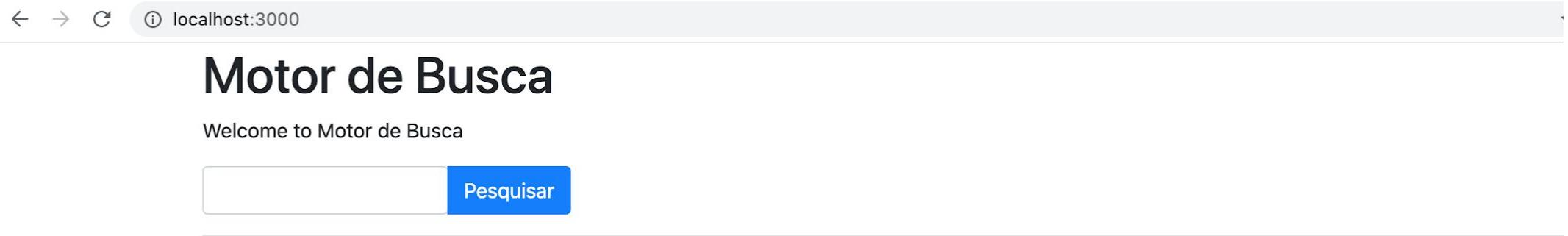
views/index.ejs

```
<body>
  <div class="container">
    <h1><%= title %></h1>
    <p>Welcome to <%= title %></p>
    <form action="" method="GET">
      <div class="btn-group" role="group">
        <input type="text" class="form-control" name="q" value='<%= query %>' />
        <input type="submit" value="Pesquisar" class="btn btn-primary" />
      </div>
    </form>
    <hr />
  </div>
```

routes/index.js

```
return res.render('index', { title: 'Motor de Busca', movies: [], query: " "});
```

Caixa de busca



routes/index.js

```
function simplify(text){  
  const regex = /[\s,\.,;\\(\\)\\-\\+]/;  
  return text.toUpperCase().split(regex);  
}
```

routes/index.js

```
router.get('/', function(req, res, next) {
  if(!req.query.q)
    return res.render('index', { title: 'Motor de Busca', movies: [], query: " " });
  else {
    const query = simplify(req.query.q);
    const mongoClient = require("mongodb").MongoClient;
    mongoClient.connect("mongodb://localhost:27017")
      .then(conn => conn.db("netflix"))
      .then(db => db.collection("movies2").find({tags: {$all: query }}))
      .then(cursor => cursor.toArray())
      .then(movies => {
        return res.render('index', {title: 'Motor de Busca', movies, query: req.query.q});
      })
    }
});
```

views/index.ejs

```
<ul class="list-group">
<% for(let i=0; i < movies.length; i++) { %>
<li class="list-group-item">
  <strong><%= movies[i].title %></strong> (<%= movies[i].year %>)
  <div class="text-muted">Starring <%= movies[i].cast %> and directed by <%
  movies[i].directors %>. </div>
</li>
<% } %>
</ul>
```

Resultados de busca

localhost:3000/?q=robin+williams+drama+1998



Motor de Busca

Welcome to Motor de Busca

robin williams drama 19

Pesquisar

What Dreams May Come (1998)

Starring Robin Williams,Cuba Gooding Jr.,Annabella Sciorra,Max von Sydow and directed by Vincent Ward.

Patch Adams (1998)

Starring Robin Williams,Daniel London,Monica Potter,Philip Seymour Hoffman and directed by Tom Shadyac.

Blog



Tutorial de ReactJS com Node.js

O React, resumidamente, é uma biblioteca para construção de interfaces, muito utilizado em Single Page Applications (SPA), uma arquitetura de front-end que permite que, quando você altere de uma página para outra na sua aplicação web, não seja necessário um carregamento completo da mesma, mas sim apenas o conteúdo que é diferente. Isso além de proporcionar uma experiência mais suave ao usuário, dá uma performance muito superior.

E o melhor: tudo isso inteiramente usando JavaScript!

Sim, o HTML, CSS, comportamentos...toda a interface é codificada usando somente JavaScript.

Eu tive a oportunidade de trabalhar no Banco Topázio, onde tanto o Internet Banking quanto o Mobile Banking eram feitos usando ReactJS e React Native, respectivamente, e achei muito legal essa experiência.



Referências

Teoria:

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Open Mic

