Deployment, charting, JWT

Services for app hosting, how to plot a chart, what is JWT

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Agenda

Deploying your app to the world

     Heroku vs Openshift

     Netlify vs Surge

     Hosting on google cloud

Charting

JWT

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Deploying your application to the world - practices

- Multiple platforms to deploy your application (PaaS - platform as a service)
- Usually trough CI/CD (continuous integration and continuous delivery) pipeline
- Credentials stored on the server
- Application served on one server, DB on other and SSO on third
  - Microservices

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Deploying your application using Heroku or Openshift

- Heroku and Openshift are Platforms as a Service for multiple languages
- Stable pipeline and logging services
- Possibility to hook directly to git repository with custom build commands so you don't have to build your app before deploying it

- Heroku has free tier with limited bandwidth and running processes

- Openshift can be run on any server and used as a PaaS with free tier as well but needs to be resubscribed

Deploying your application using Netlify or Surge

- Netlify is directly connected to Git repository and can run specific commands limited to one running command
- Netlify allows to edit domain names as 3rd domain name level (your-app.**netlify.com**)

- Surge has no web service, everything is done through CLI
- Same as Netlify it allows changing domain as 3rd domain name level (your-app.**surge.sh**)

Hosting your application on google cloud

- Similar to Heroku and Openshift
- Comes with custom GIT repository
- Option to host API and frontend app from same service
- Pay as you go
    - You'll pay for number of visits or API hits etc.

- Two options
    - Google cloud – multiple services not only for serving FE app
    - Firebase – frontend and android apps

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Charting in react

- Plotly
  - Made by company focused on data visualization and manipulation
  - Animations and data visualization out of the box
  - [Covid trends](#)
- Recharts
  - Easy to use
  - Builds on top of d3
- Nivo
  - Huge selection of charts
  - Support for SVG, Canvas and plain HTML
  - Really nice documentation where you can test your code

https://plotly.com/javascript/react/
https://github.com/recharts/recharts
https://nivo.rocks/components

Charting in react - continue

- Uber
  - Plot library build by uber company
  - Comes with a storybook to test your data
- VX
  - Direct connection to d3 in order to display data in React
  - Small bundle size
  - Aims to be a platform for your charts
- Victory
  - Easy to use
  - Very modular

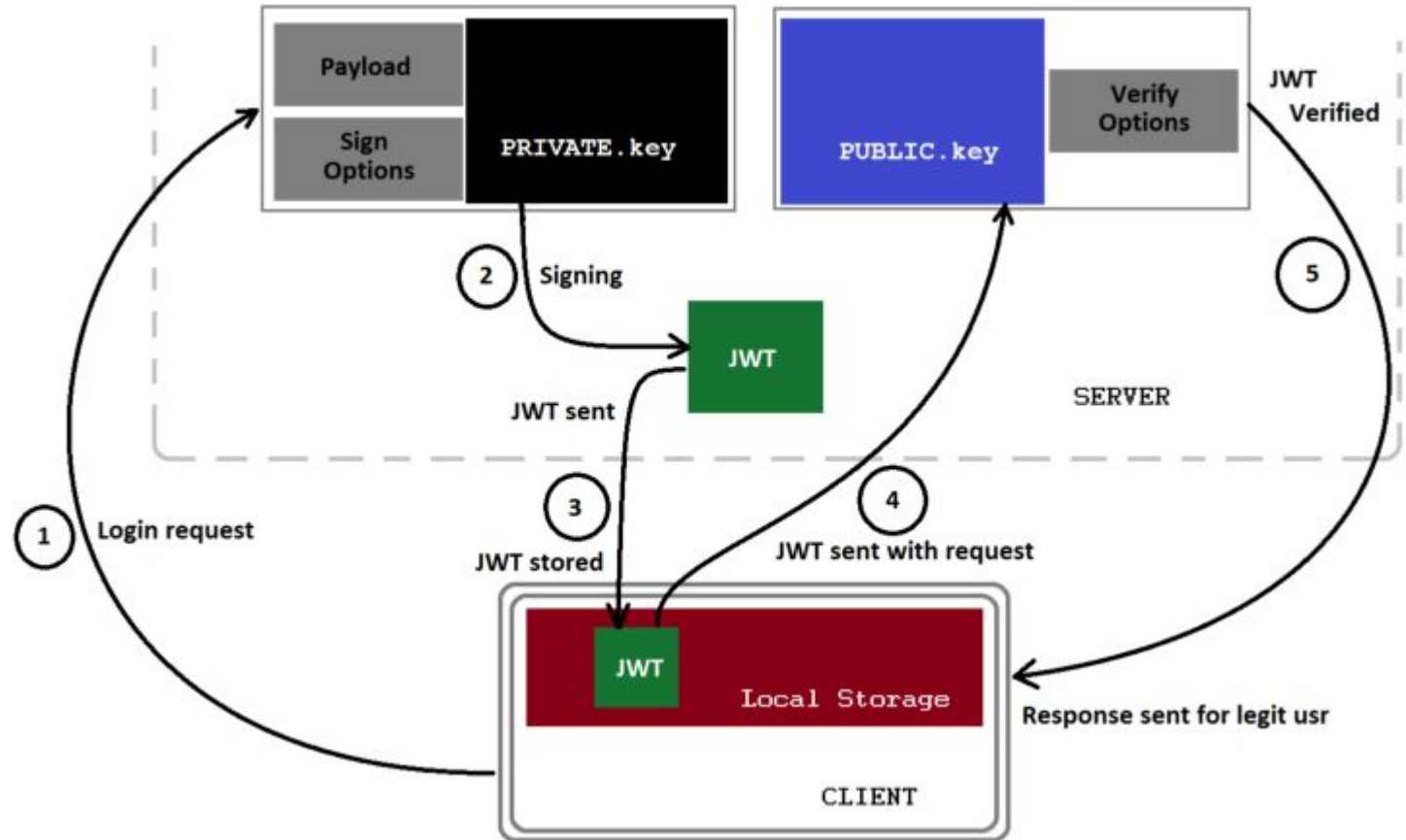- Examples https://codesandbox.io/s/recursing-hawking-wnbki9

JWT

- It's an open standard used for Authorization and Information exchange

- First auth server creates JWT token (doesn't have to be anAPI server)

  - Header – contains type and signature method

  - Payload – the actual user data

  - Signature – header + payload + secret (can be priv/pub key)

    Signatures are not encryptions!

- Requests to server contains Bearer token as Authorization method (can also be stored in cookie, not ideal way)

https://tools.ietf.org/html/rfc7519
https://developer.okta.com/blog/2019/08/22/okta-authjs-pkce

JWT – RS256

- JWT provider uses private key to generate the JWT token

- API server uses public key of JWT provider to verify the token is correct

https://siddharthac6.medium.com/json-web-token-jwt-the-right-way-of-implementing-with-node-js-65b8915d550e

JWT – HS256

- JWT provider uses secret to sign the token

- API server same secret to verify the token

Header	Payload	Signature
base64enc({ "alg": "HS256", "typ": "JWT" })	base64enc({ "iss": "toptal.com", "exp": 1426420800, "company": "Toptal", "awesome": true })	HMACSHA256(base64enc(header) + '.' +, base64enc(payload) , secretKey)

11

Project update

- Let's add a table to the project

- Let's add a chart library to the project

https://tools.ietf.org/html/rfc7519

- Old
  - jQuery
  - Ajax
  - Single Session
  - Variables
  - IE drove it in the past
  - Lodash
  - Callback hell
  - Bootstrap
- New
  - Transpilers
  - JS is slowly moving towards functional programming - map, lambda, reduce, etc.
  - SSO with JWT
  - Improved Browser API
  - Dependency hell
  - Build tools - module based codebase
  - Multiple free and opensource design systems
  - Virtual DOM, component architecture, pure functions - React

Single sign on/out/only

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Popis problemu

- Two scenarios
  - Single page web application
  - Library to used in any further project
- All build processes managed from one place
  - Easy use once we have everything all set up
- We want to use the newest javascript goodies
- Some framework so we have easier DOM manipulation
- One package manager

Historie – aneb pred vice nez 5 lety

- Bower was the main place to go for packages
  - It is slowly dying and on 02 Oct 2017 was announced that users should migrate to something else
- First there was Grunt
  - On 11 January 2012 this first task runner was introduced, it was a breakthrough in frontend development.
  - Pros: Fairly simple, easy to use
  - Cons: Temporary files, piping one file trough multiple tasks was cumbersome
- Then there was Gulp.js
  - On 26 September 2013 was released taks runner that was heavily inspired by Grunt
  - Pros: Faster, file piping
  - Cons: Config can be really confusing to newcomers
- jQuery
  - Most hated and loved library to manipulate DOM

https://bower.io/blog/2017/how-to-migrate-away-from-bower/

Proc to selhalo

- NPM took over because it simply had a lot more packages

- NPM also introduced several built in scripts, that ca be ran at certain point of installation/build

- Package managers now contain task runner

- Configs were too hard to maintain - few people really understood file piping

- Debugging of build process was not so easy

- Modern build tools have much better features
  - HTTP/2 code splitting
  - Built in minification
  - Built in sourcemaps
  - Tree shaking
  - And many more

Dnesni stav – package manager / task runner

- Yarn

  - Developed by Facebook

  - Supports workspaces - great for monorepos

  - Easier task runner and package installation

  - First to introduce lock file

- NPM

  - Developed by Google

  - Comes with node

  - Contains NPX

  - Convenient for larger teams spread across globe

- PNPN

  - Honorable mention - hard linking packages instead of downloading and installing

Dnesni stav – build nastroje

- Webpack
  - All purpose build tool
  - Extensive configuration options
  - Configuration is required
  - Extensible
- Parcel
  - Zero config file
- Rollup
  - Focus on building ES libraries

Nutnost transpileru, co to je?

- Babel
    - Javascript transpiler to provide backwards compatibility of new JS syntax quirks and fashion
    - Each file is parsed separately and compiled into native JavaScript
    - Huge collection of plugins - you can even write your own plugins
- Typescript
    - JavaScript flavor/superset with data types
    - Compiles into JavaScript
    - Custom plugins called Language Service Plugin - not that used as with babel

Babel config

- Multiple formats
  - JS, JSON, ES6
- Option to write custom functions in plugins [1]
- `BABEL_ENV` to use different config per different environment
- Option to write config in package.json

```json
{
  "presets": [
    [
      "@babel/env",
      {
        "targets": "> 0.25%, not dead"
      }
    ],
    "@babel/react",
  ],
  "plugins": [
    [
      "@babel/plugin-proposal-decorators",
      {
        "legacy": true
      }
    ],
    "babel-plugin-lodash",
    "@babel/plugin-proposal-class-properties"
  ]
}
```

[1] https://www.npmjs.com/package/babel-plugin-import

Scenar: Webova aplikace – Parcel vs Webpack

- React application
- Dev server
    - Proxy to API
- HTML template
- Tree shaking
- One config to rule them all (dev vs prod)
- Custom envs from terminal/.env file
- Static files loader – images, styles

Scenar: Knihovna – Rollup vs Webpack

- React library

- Bundled to one file and to multiple files as well

- Externals

  - 3rd party libraries not bundled in final build

- Named vs Default exports

- Multiple environments

  - ESM, UMD, CommonJs

Conclusion library

Webpack

- No native support for full ESM bundles
  - Webpack 5 promises to implement it
- Harder to set-up
- Easier to read

Rollup

- Everything has to be done through plugins +/-
- Smaller bundle size
- Supports native ESM!
- Named exports
  - You need to list all named exports

Conclusion - funny

- Webpack is like VIM

    - Hard to setup and if something breaks you have to really understand it

    - But the things that can be done with it are almost limitless

- Parcel is like MS word

    - No need to configure anything

    - If you need to tweak something up, it's really hard to do

- Rollup is like VS Code

    - One of the greatest software for one thing

    - Handles poorly web apps

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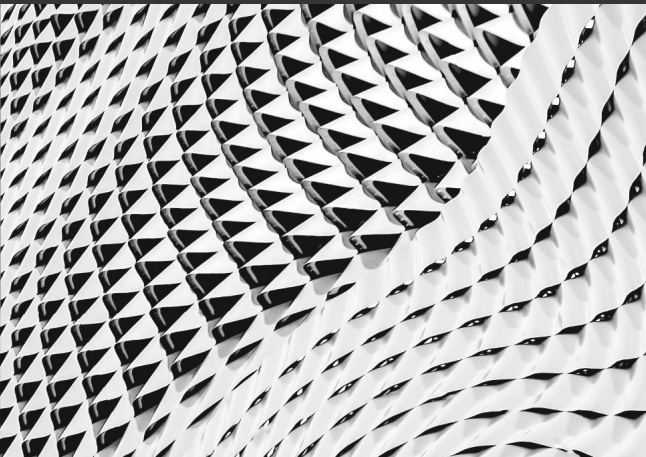
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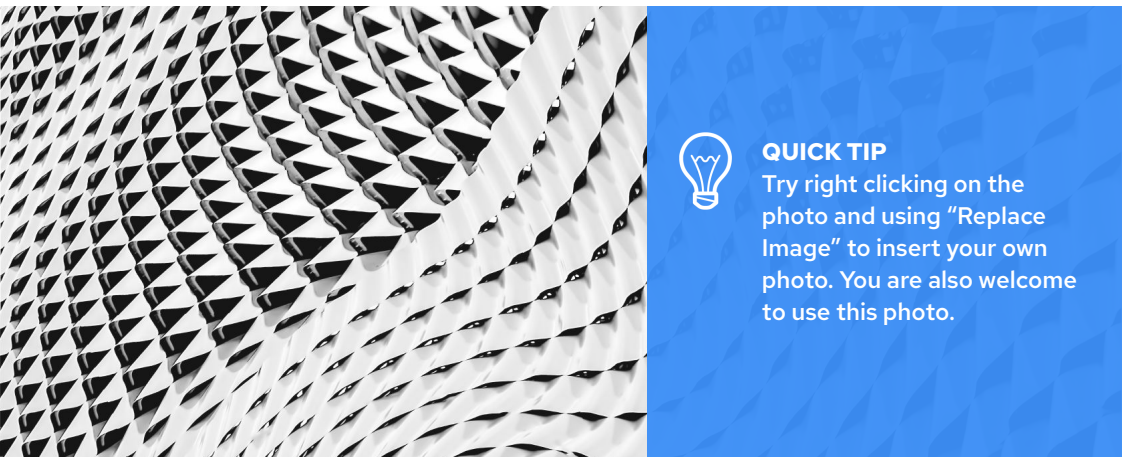
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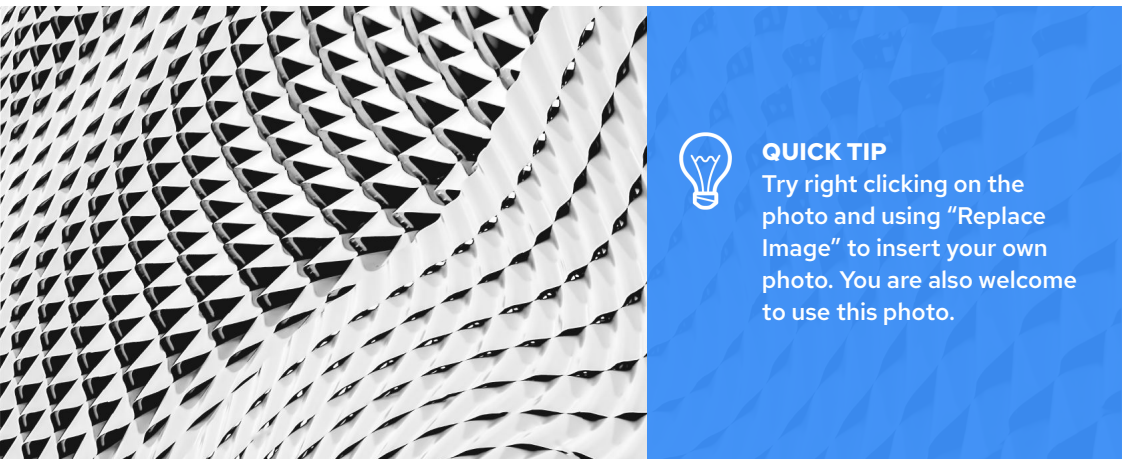# Divider title limit to two lines

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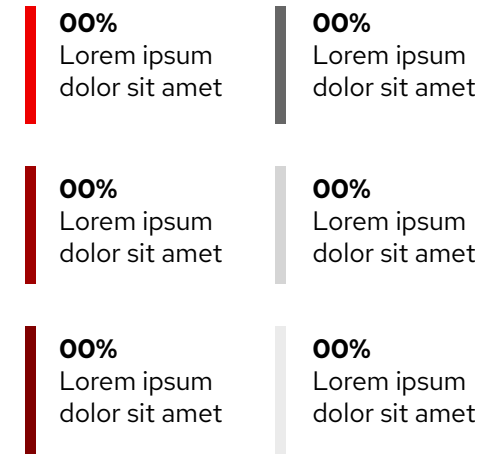Insert source data here
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What we'll discuss today

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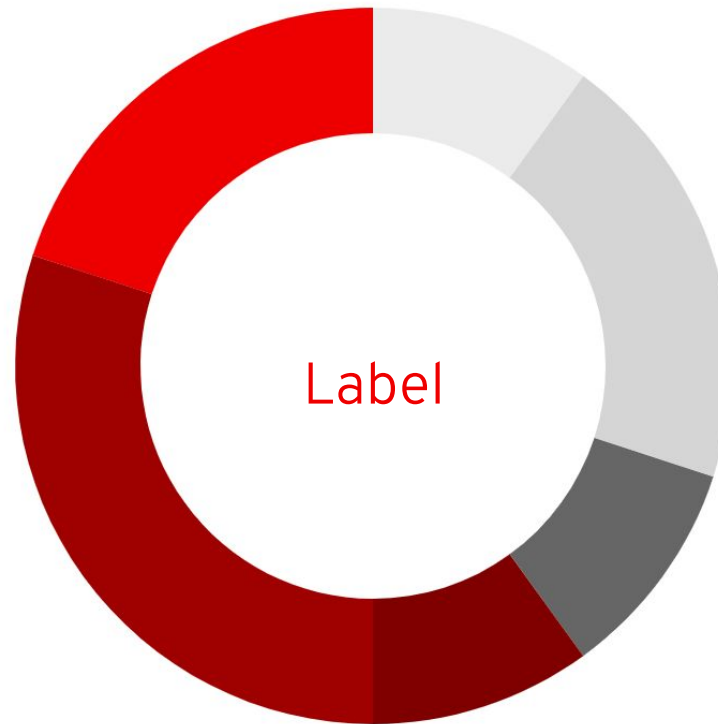
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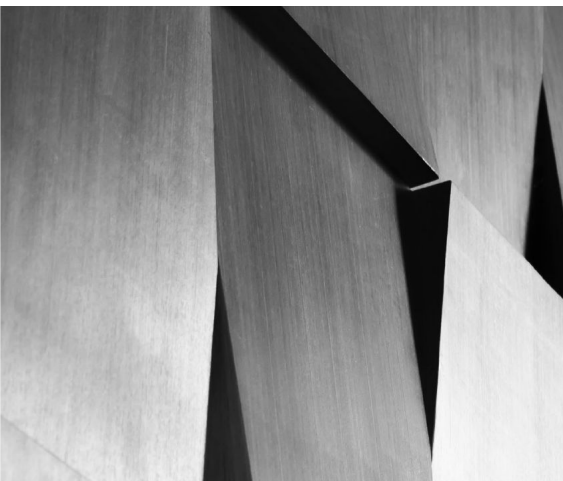# Lorem ipsum dolor sit amet, consectetuer adipiscing elit

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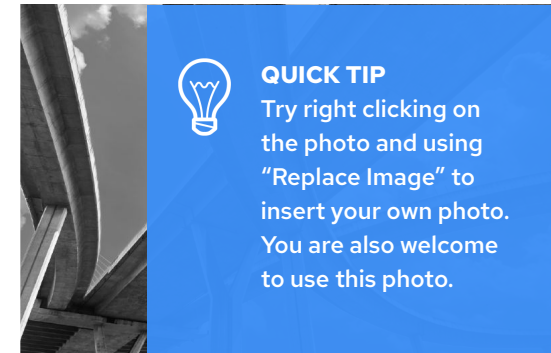
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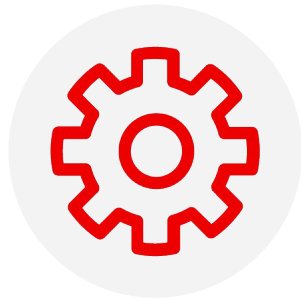Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh mod tincidunt.

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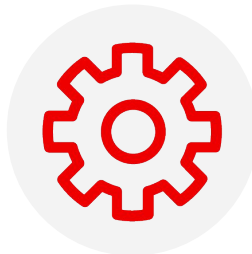Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh mod tincidunt.

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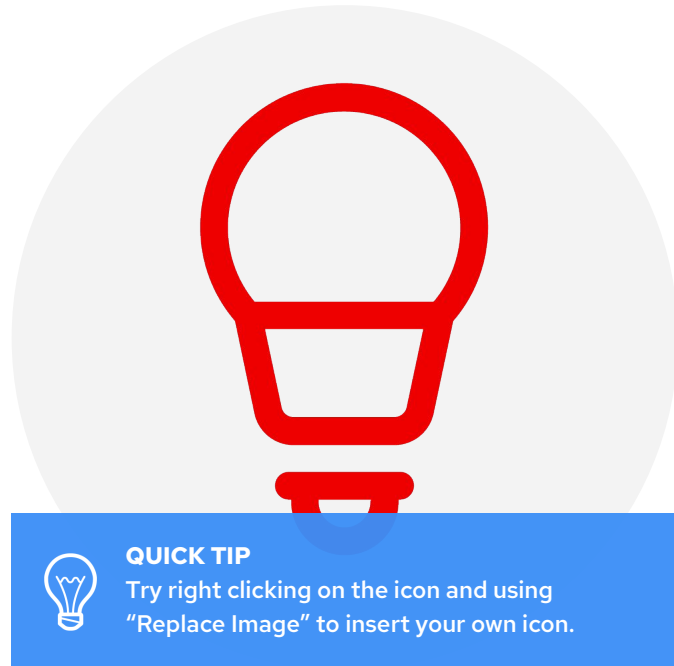
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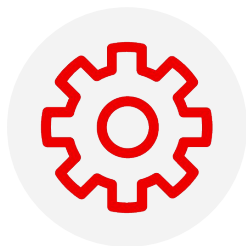Lorem ipsum dolor sit amet, consectet adipiscing elit sed dia.

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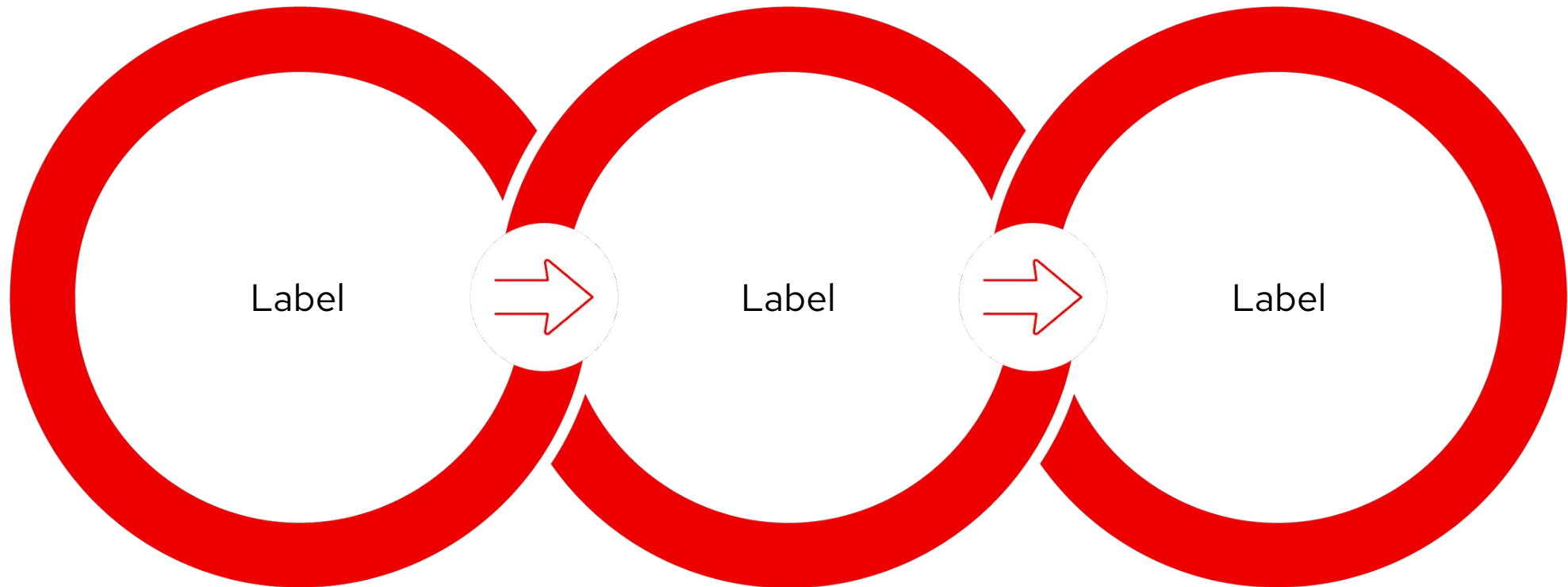Lorem ipsum dolor sit amet, consectetuer adipiscin elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore.

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QUICK TIP
Using a photo with the large quote is optional. Try right clicking on the photo and using "Replace Image" to insert your own photo.

John Doe
CTO, Acme Unlimited

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John Doe
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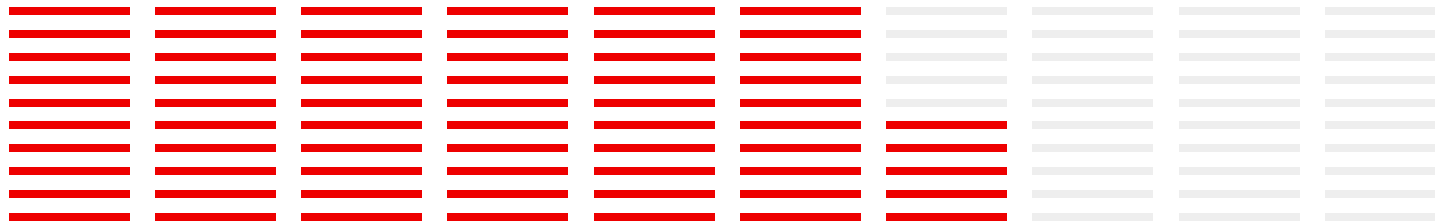
John Doe
CTO, Acme Unlimited

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This section includes:

Data slide templates

Table slide templates

Timeline slide templates

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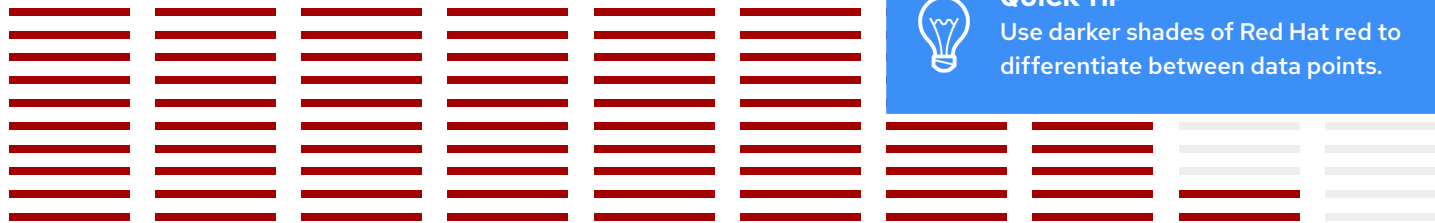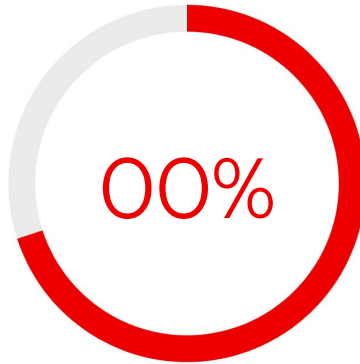Insert source data here

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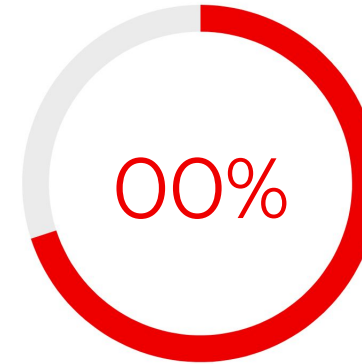# Lorem ipsum dolor sit amet, consectetuer adipiscing elit

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QUICK TIP
To edit a chart, select it and click the dropdown arrow in the top right. Select "Open source." The percentage will need to be updated manually.

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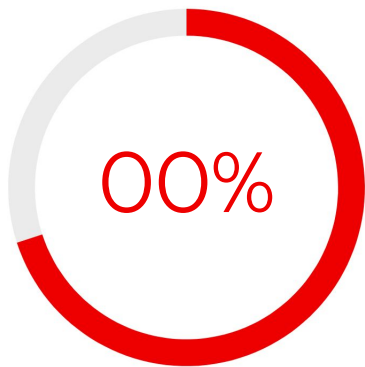Insert source data here
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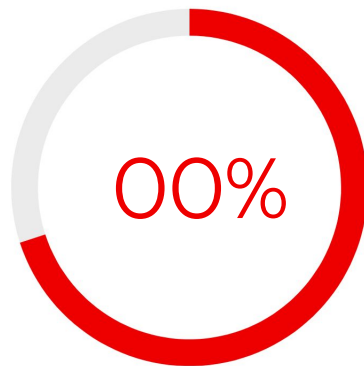
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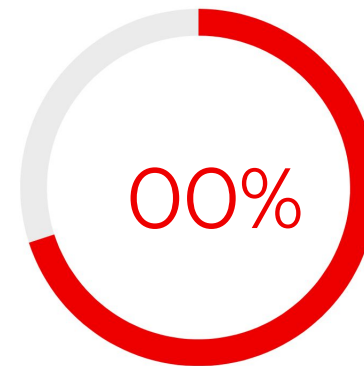
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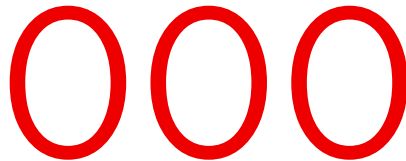Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod.

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QUICK TIP
Use the "Width Scale" in the "Size & Position" pane of the format
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Red Hat

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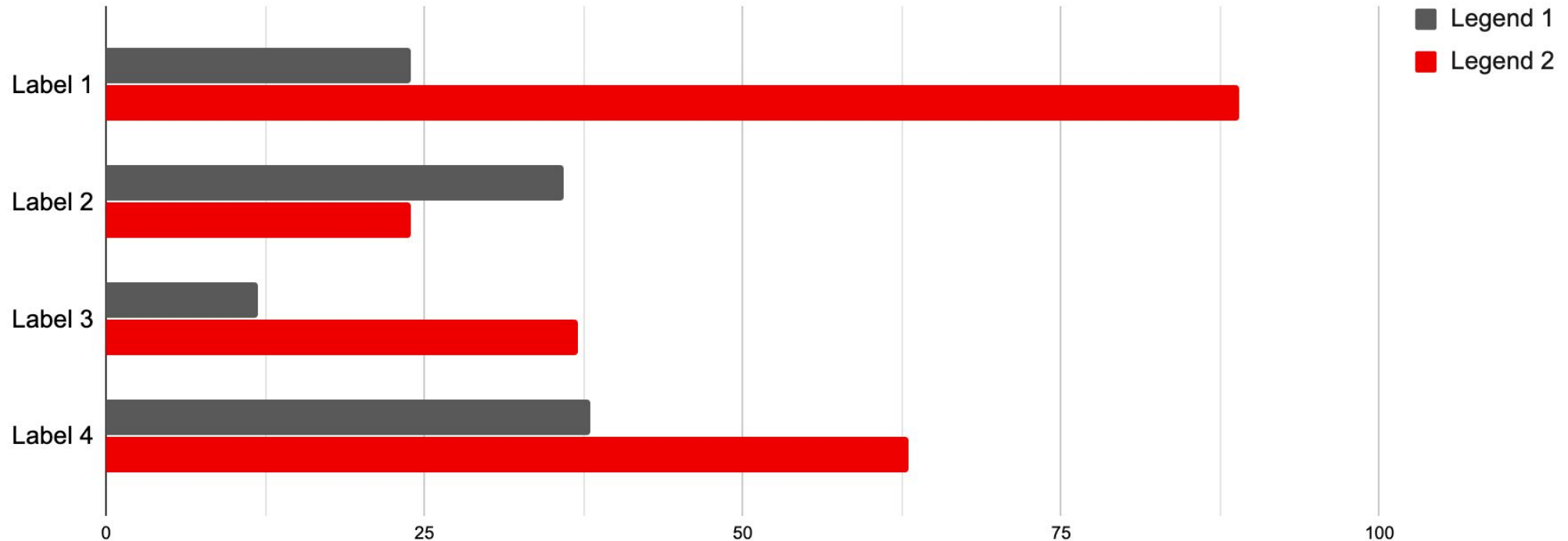
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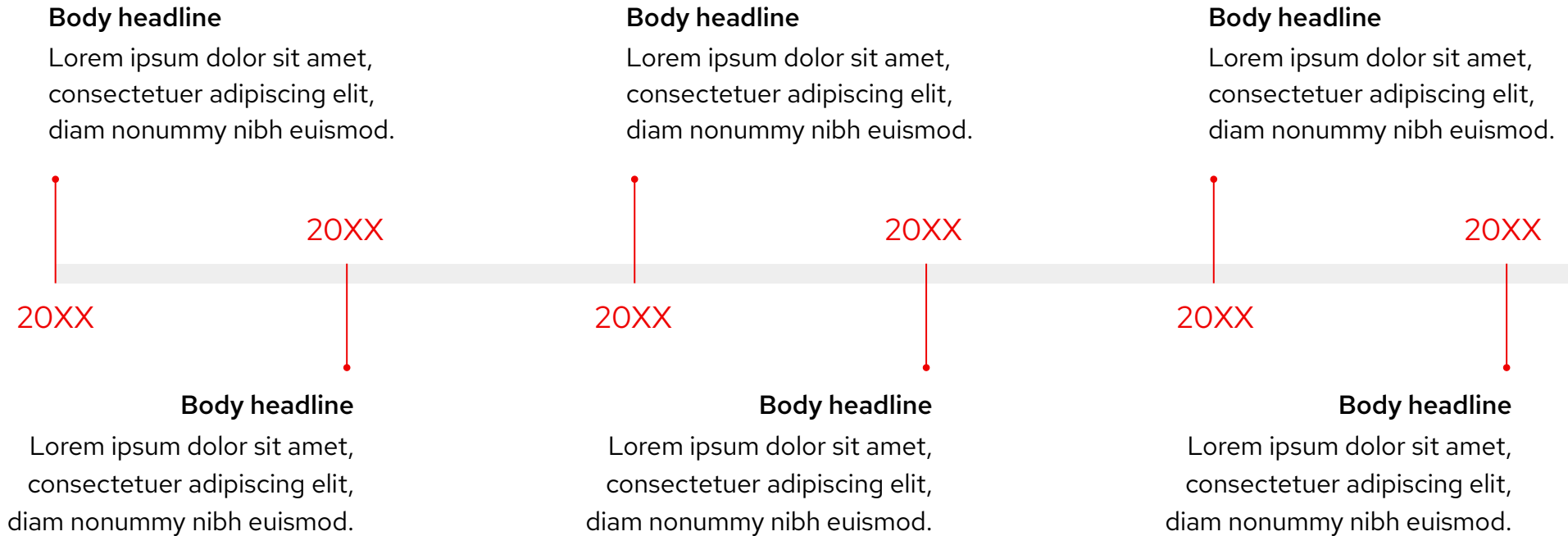# Lorem ipsum dolor sit amet, consectetuer adipiscing elit

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