

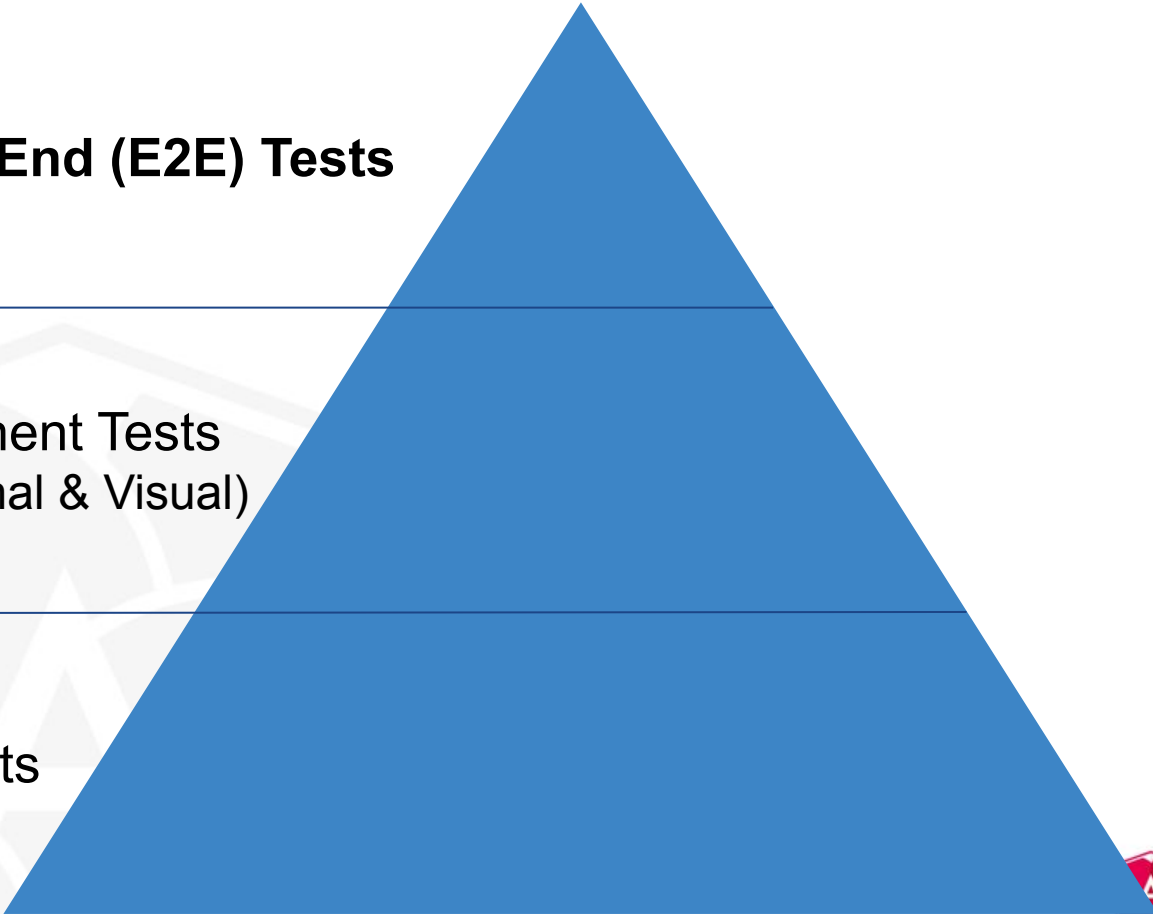


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# Angular Testing

## 6 - E2E Basics

**End-to-End (E2E) Tests**

A blue pyramid diagram is positioned on the right side of the slide. It is divided into three horizontal sections by two thin blue lines. The top section is the smallest, the middle section is medium-sized, and the bottom section is the largest. To the left of the pyramid, the text 'End-to-End (E2E) Tests' is aligned with the top section, 'Component Tests (Functional & Visual)' is aligned with the middle section, and 'Unit Tests' is aligned with the bottom section. The pyramid itself is a solid blue color.

**Component Tests  
(Functional & Visual)**

**Unit Tests**



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## 2 Core Technologies for E2E Frameworks

1. WebDriver
2. Chrome DevTool Protocol (CDP)



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# WebDriver

- W3C Standard
- Cross-Browser Support
- Known to be flaky
- WebDriver BiDi as successor
- Popular E2E Tools
  - Protractor
  - Selenium
  - NightWatch
  - WebDriverIO



# CDP (Chrome DevTools Protocol)

- Debugging Tool for Chromium-based Browsers
- Puppeteer as primary library
- Playwright incl. Safari
- Much more stable
- Constrained to CDP-Browsers



Cross Browser  
Support

Reliability

WebDriver



CDP  
(Chrome DevTools Protocol)



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Cross Browser  
Support

Reliability

WebDriver



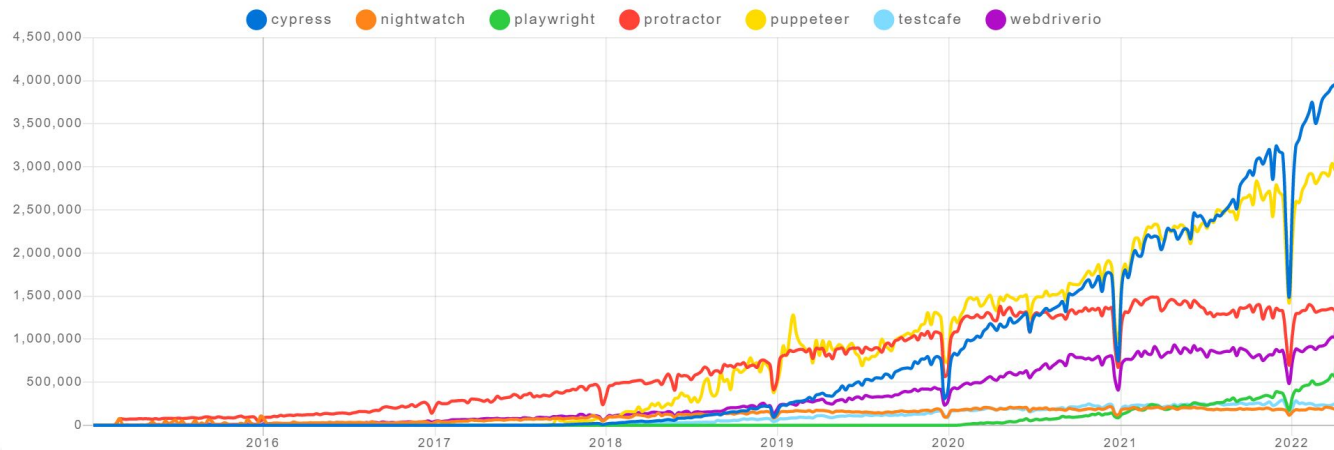
CDP  
(Chrome DevTools Protocol)
















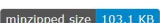


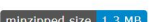



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## Stats

			Stars	Issues	Version	Updated ②	Created ②	Size
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	nightwatch	 	11,056	168	2.1.3	9 days ago	8 years ago	minzipped size  369.1 KB
	playwright	  	37,040	492	1.21.1	11 days ago	7 years ago	bundlephobia  429
	protractor	  	8,789	679	7.0.0	2 years ago	9 years ago	minzipped size  61.7 KB
	puppeteer	  	77,424	1,856	13.7.0	a day ago	9 years ago	minzipped size  103.1 KB
	testcafe	  	9,302	385	1.18.6	11 days ago	9 years ago	minzipped size  1.3 MB
	webdriverio	  	7,472	162	7.19.5	16 days ago	8 years ago	





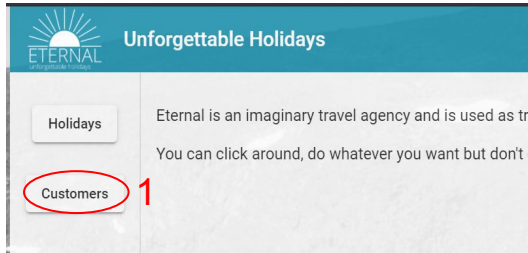
# Cypress

- Node.js Application
- Great Developer Experience
- Good Documentation
- Easy Setup
- Internal "IDE"
- CI Features like Videorecording and Screenshots

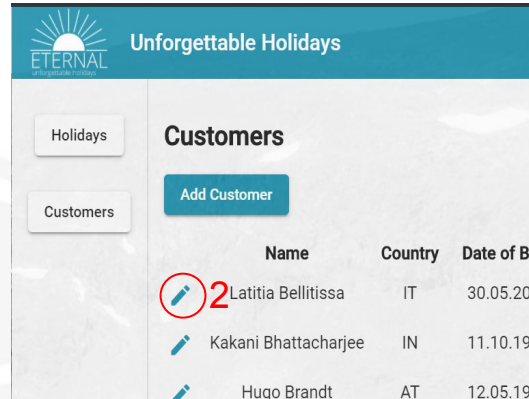


# The Await Feature

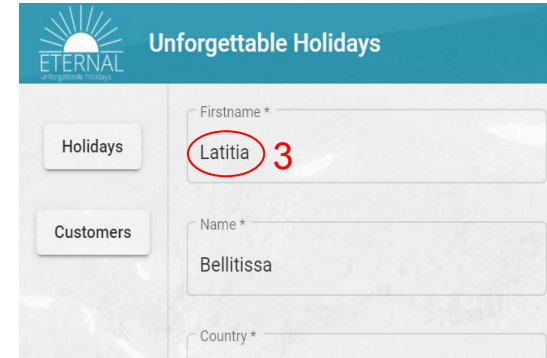




1. Select Customers



2. Select Customer



3. Edit Firstname



# Unforgettable Holidays

Holidays

Customers

Firstname \*

Latitia

Name \*

Bellitissa

Country \*

Italy

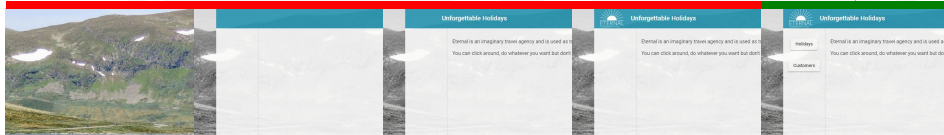
Birthdate \*

30.5.2002

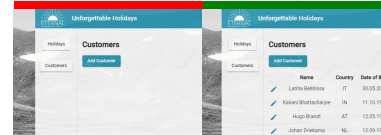


# Non-Waiting Style

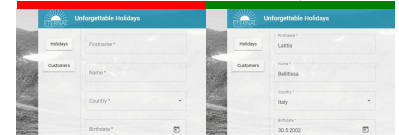
## 1. Select Customers



## 2. Select Customer

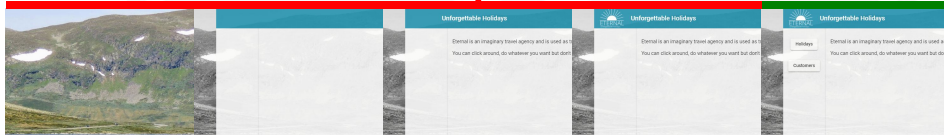


## 3. Edit Firstname

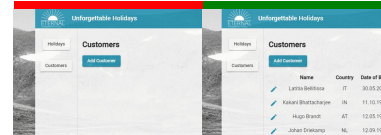


# Non-Waiting Style

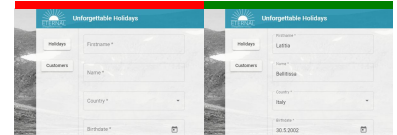
## 1. Select Customers



## 2. Select Customer

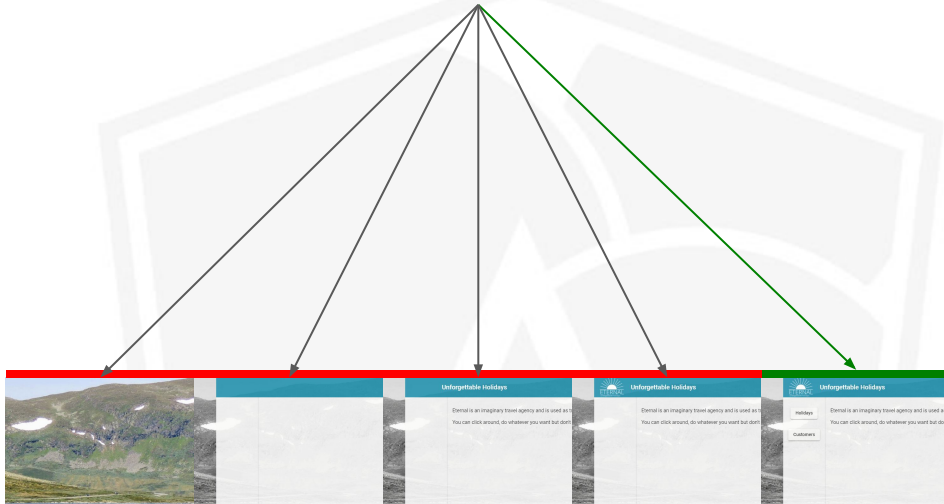


## 3. Edit Firstname

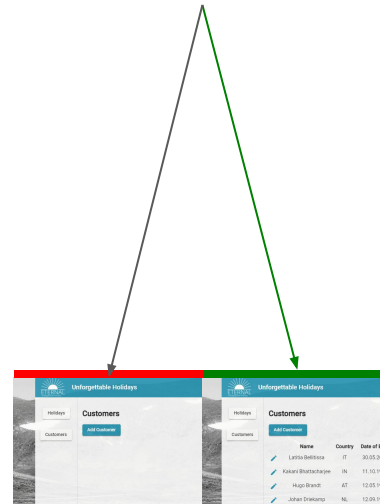


# Waiting Style

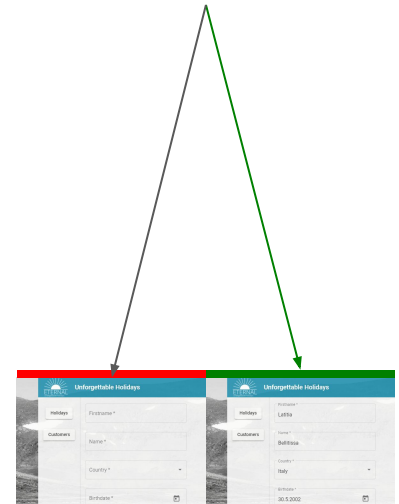
## 1. Select Customers



## 2. Select Customer



## 3. Edit Firstname



# Commands

- Methods of "cy." object
- Run asynchronously
  - "Feels" like a Promise (thenable) but isn't
  - Don't use async/await
- Are chainable





# Commands

- `cy`
  - `.visit(url: string)`
    - Can only be run at the beginning
    - Domain can't be changed
  - `.get(selector)`
    - Uses jQuery selectors
  - `.contains`
  - `.click`
  - `.type`



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# An E2E Test in Cypress

```
it('should rename Latitia to Laetitia', () => {  
  
  cy.visit('');  
  
  cy.get('mat-drawer a').contains('Customers').click();  
  
  cy.get('div').contains('Latitia Bellitissa').siblings('.edit').click();  
  
  cy.get('input:first').clear().type('Laetitia');  
  
  cy.get('button[type=submit]').click();  
  
  cy.get('div').contains('Bellitissa').should('have.text', 'Laetitia Bellitissa');  
  
});
```



# Assertions Implicit

- Behaves like a normal command
- Does waiting as well
- Good for single assertions

```
cy  
  
  .get('h1')  
  
  .should(  
  
    'have.text',  
  
    ' Unforgettable Holidays '  
  
  );
```



# Assertions Explicit

- More verbose
- Good for multiple assertions
- Messaging

```
cy.get('h1').should(($h1) => {  
  
  expect($h1).to.have  
  
    .text(' Unforgettable Holidays ');  
  
});
```



# Cypress Goodies

- lodash: Cypress.\_
- jQuery: Cypress.\$
- Uses Mocha and Chai
  - Not Jest
  - Very similar commands



# When not to use Cypress?

- Cross Browser Support
- ~~Multiple Super Domains~~ ← Available since v9.6



Demo



# Flakiness / Unreliability

```
describe('Customers', () => {  
  
  it('should add a customer', () => {  
  
    cy.visit('');  
  
    cy.get('a').contains('Customers').click();  
  
    cy.get('a').contains('Add Customer').click();  
  
  });  
  
});
```



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# Flakiness / Unreliability

- Commands are not retried when they are successful
- Chains are multiple commands
- `cy.get` & `cy.contains` are commands

```
cy.get('a').contains('Add Customer').click();
```

↑

1

↑

2



# Prevent Flakiness by Assertion

```
describe('Customers', () => {  
  
  it('add customer', () => {  
  
    cy.visit('');  
  
    cy.get('a').contains('Customers').click();  
  
    cy.get('a').should('contain', 'Add Customer');  
  
    cy.get('a').contains('Add Customer').click();  
  
  });  
  
});
```



# Prevent Flakiness by a better Selection

```
describe('Customers', () => {  
  
  it('add customer', () => {  
  
    cy.visit('');  
  
    cy.get('mat-drawer a').contains('Customers').click();  
  
    cy.get('mat-drawer-content a').contains('Add Customer').click();  
  
  });  
  
});
```



# Prevent Flakiness by a much better Selection

```
describe('Customers', () => {  
  
  it('add customer', () => {  
  
    cy.visit('');  
  
    cy.get('[data-test=btn-customers]').click();  
  
    cy.get('[data-test=btn-add-customer]').click();  
  
  });  
  
});
```



Lab Time

