

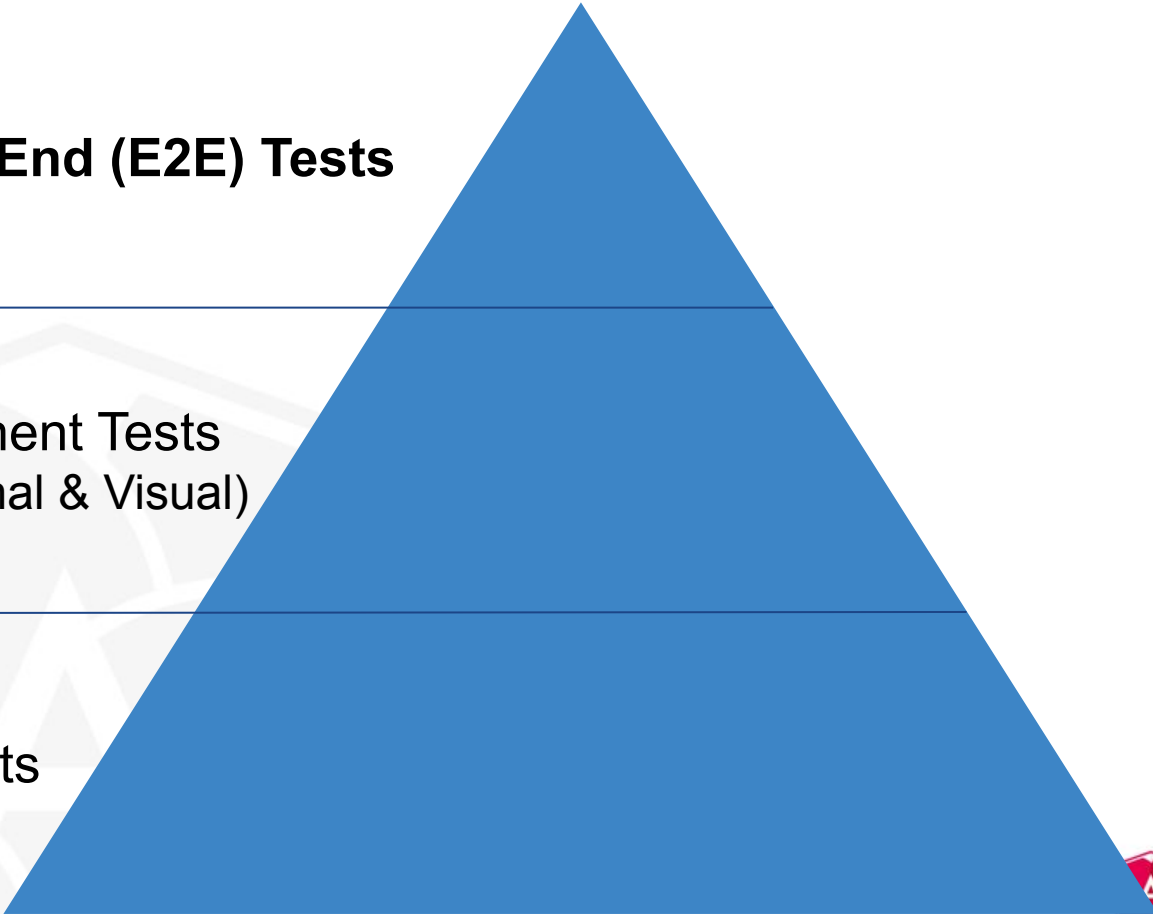


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Angular Testing

6 - E2E Basics

End-to-End (E2E) Tests



**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



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Cross Browser
Support

Reliability

WebDriver



CDP
(Chrome DevTools Protocol)



Native



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Cross Browser
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Reliability

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CDP
(Chrome DevTools Protocol)

Native



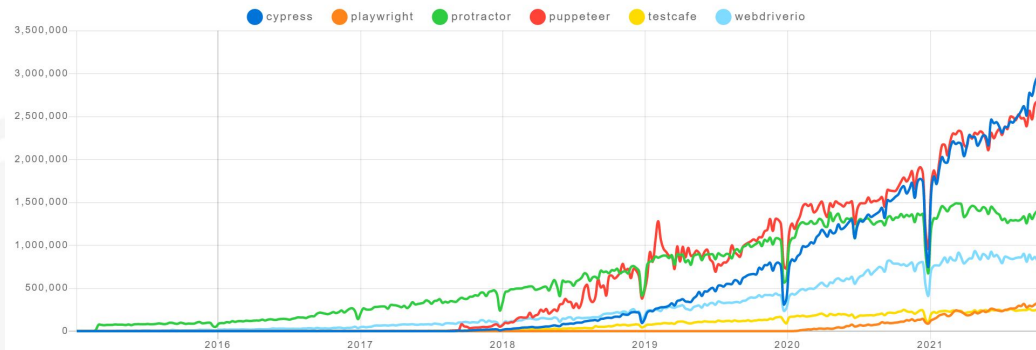
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cypress vs playwright vs protractor vs puppeteer vs testcafe vs webdriverio

Enter an npm package...

[cypress](#) x
 [playwright](#) x
 [protractor](#) x
 [puppeteer](#) x
 [testcafe](#) x
 [webdriverio](#) x
 + nightwatch
 + slimerjs
 + nightmare
 + casperjs
 + selenium

Downloads in past All time ▾



Stats

			Stars	Issues	Version	Updated ②	Created ②	Size
	cypress	npm github docs	34,213	1,792	8.6.0	13 days ago	8 years ago	minzipped size 401.6 KB
	playwright	npm github docs	-	-	1.16.1	2 days ago	7 years ago	minzipped size 364.9 KB
	protractor	npm github docs	8,755	669	7.0.0	a year ago	9 years ago	minzipped size 61.7 KB
	puppeteer	npm github docs	73,363	1,714	10.4.0	a month ago	9 years ago	minzipped size 96.5 KB
	testcafe	npm github docs	9,132	432	1.16.1	19 days ago	8 years ago	minzipped size 1.5 MB
	webdriverio	npm github docs	6,976	125	7.16.2	2 days ago	7 years ago	minzipped size 301.7 KB



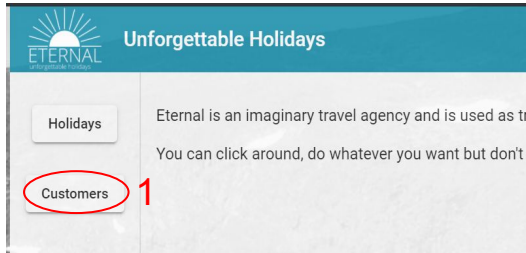
Cypress

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

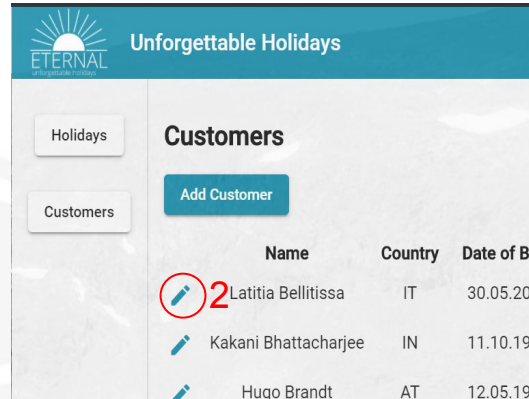


The Await Feature

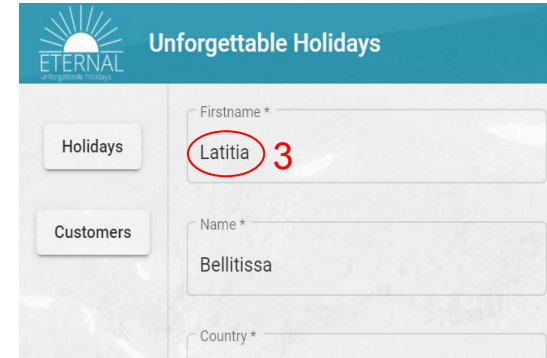




1. Select Customers



2. Select Customer



3. Edit Firstname



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Unforgettable Holidays

Holidays

Customers

Firstname *

Latitia

Name *

Bellitissa

Country *

Italy

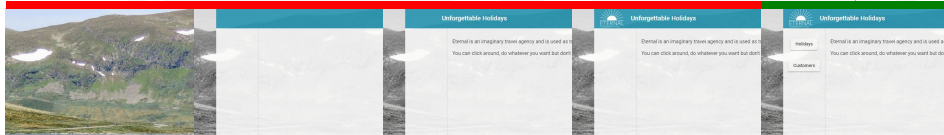
Birthdate *

30.5.2002

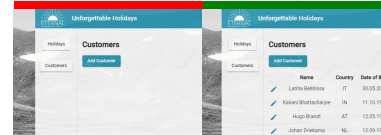


Non-Waiting Style

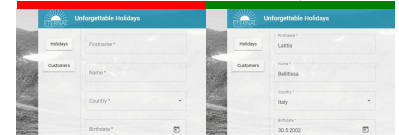
1. Select Customers



2. Select Customer

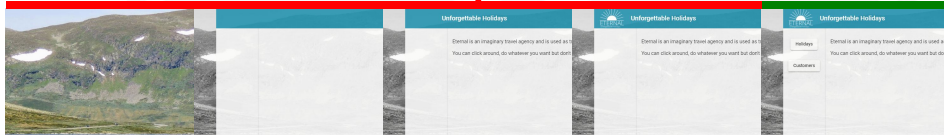


3. Edit Firstname

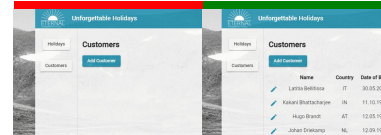


Non-Waiting Style

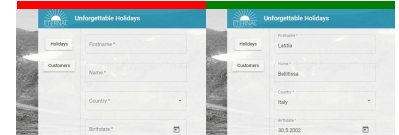
1. Select Customers



2. Select Customer

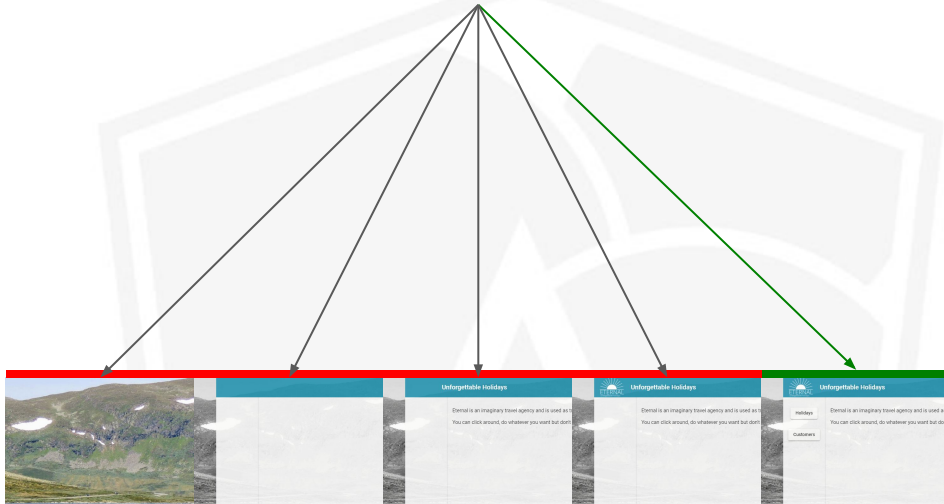


3. Edit Firstname

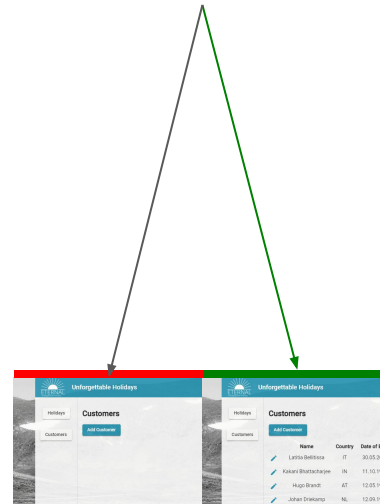


Waiting Style

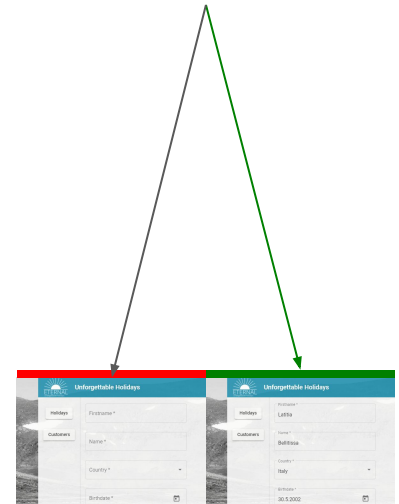
1. Select Customers



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.\$
- ~~● Moment: Cypress.moment~~
- Uses Mocha and Chai
 - Not Jest
 - Very similar commands



When not to use Cypress?

- Cross Browser Support
- Multiple Super Domains



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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



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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

