

# Cypress: End-to-end JavaScript Testing

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CYPRESS - FAST, EASY, AND RELIABLE TESTING



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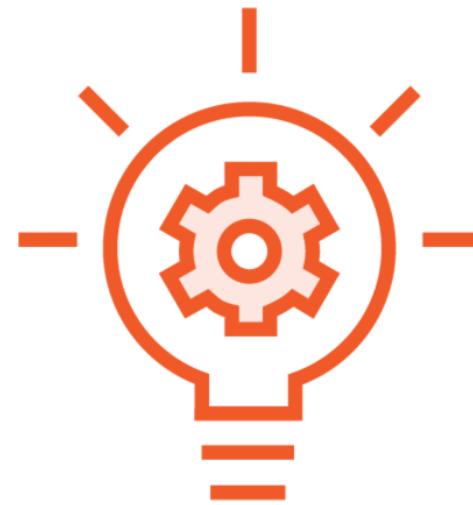
# Course Outline



What Is  
Cypress?



Writing First  
Tests



Core Concepts



Ecosystem and  
Tooling



# Overview



**What is end-to-end testing?**

**What is Cypress?**

**How is Cypress different?**

**Trade-offs**



# End-to-end Testing

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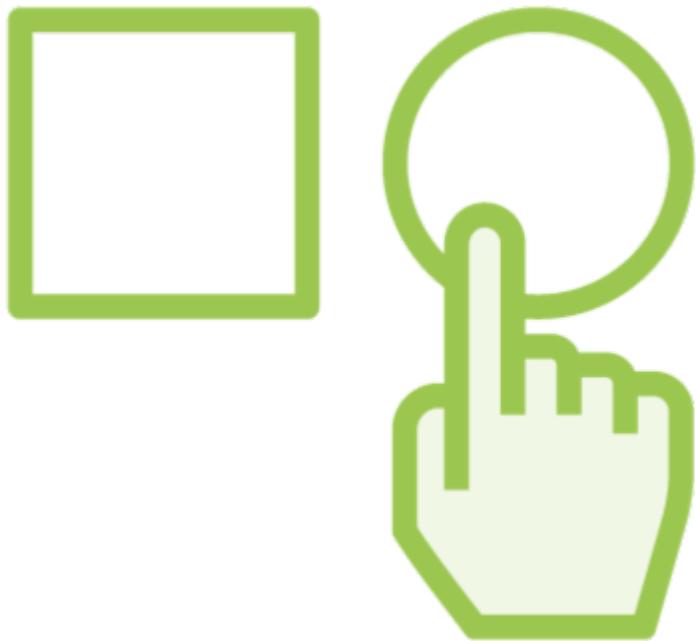
“Quality is not an act, it is a habit”

**Aristotle**



**TEST**

# Unit Tests



**Tests an isolated unit in your code (a single function, class)**

**Easiest**

**Cheapest**

**Fastest**

**Write thousands of these to validate code**



# Integration Tests



- Testing code with dependencies**
- Tests more than just an isolated unit**
- API, component tests**
- Slower than unit tests**



# End-to-end Tests

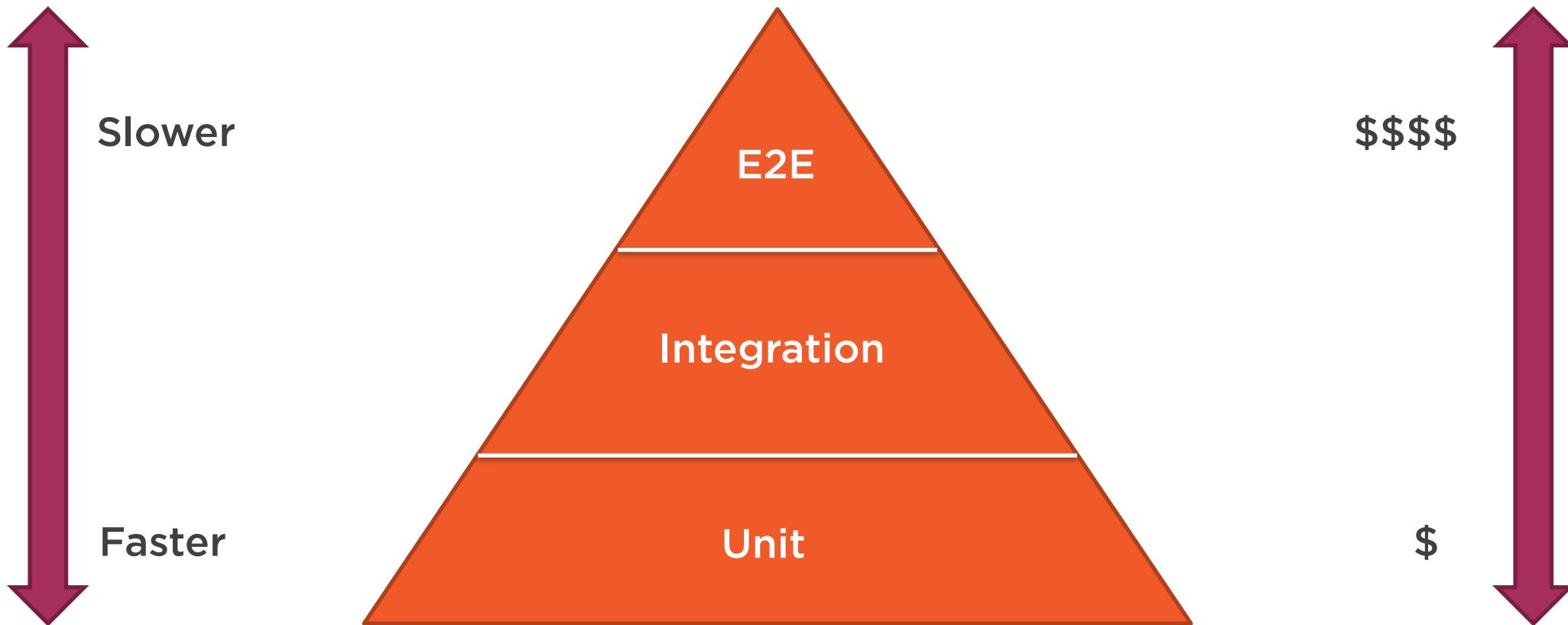


**Tests full flow of application**

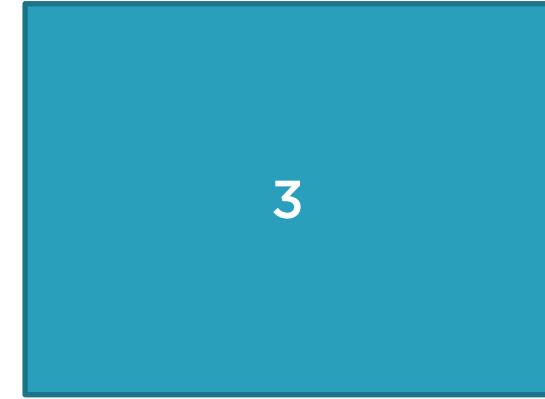
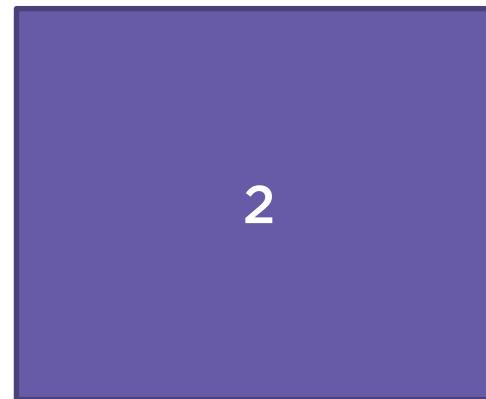
**Interacts with the application like an end user**



# Test Automation Pyramid

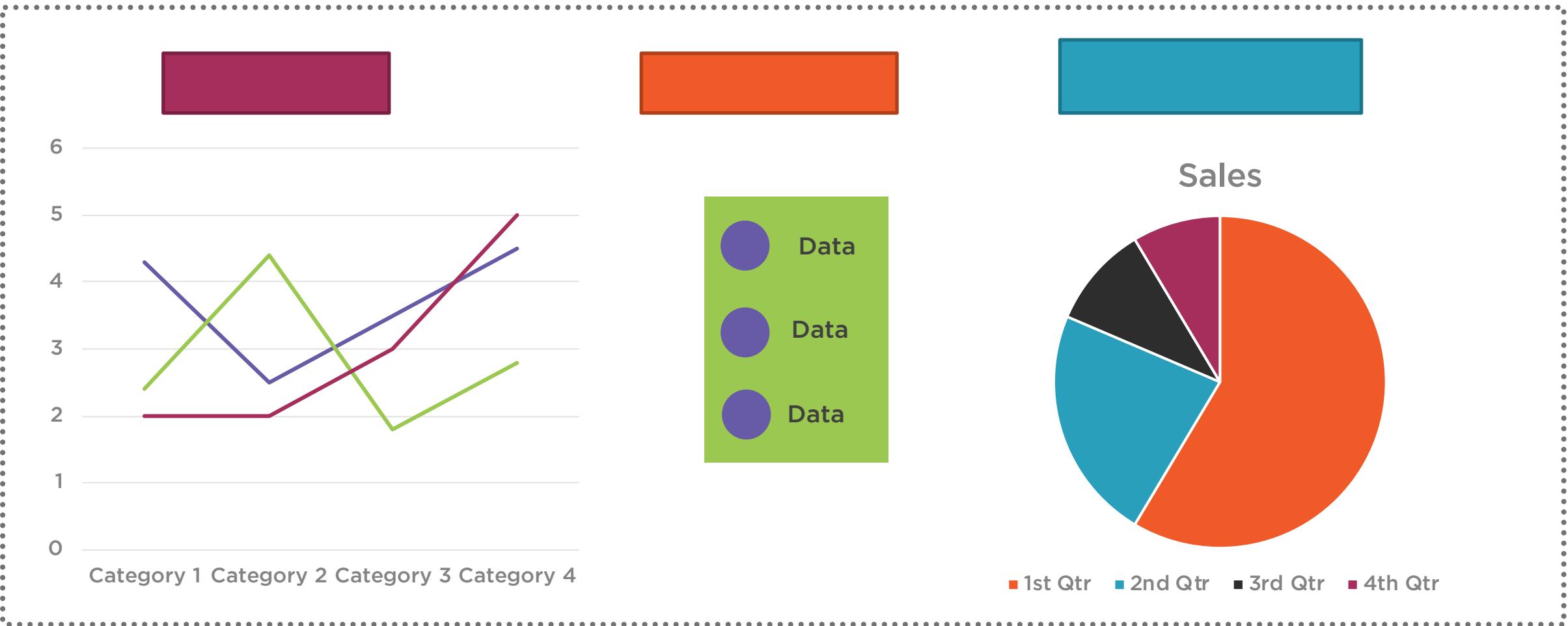


# Simple Application Testing



Just click through each button, to test the simple application.

# Scope Increase



Application gets complex, merely clicking through it manually is not efficient testing.



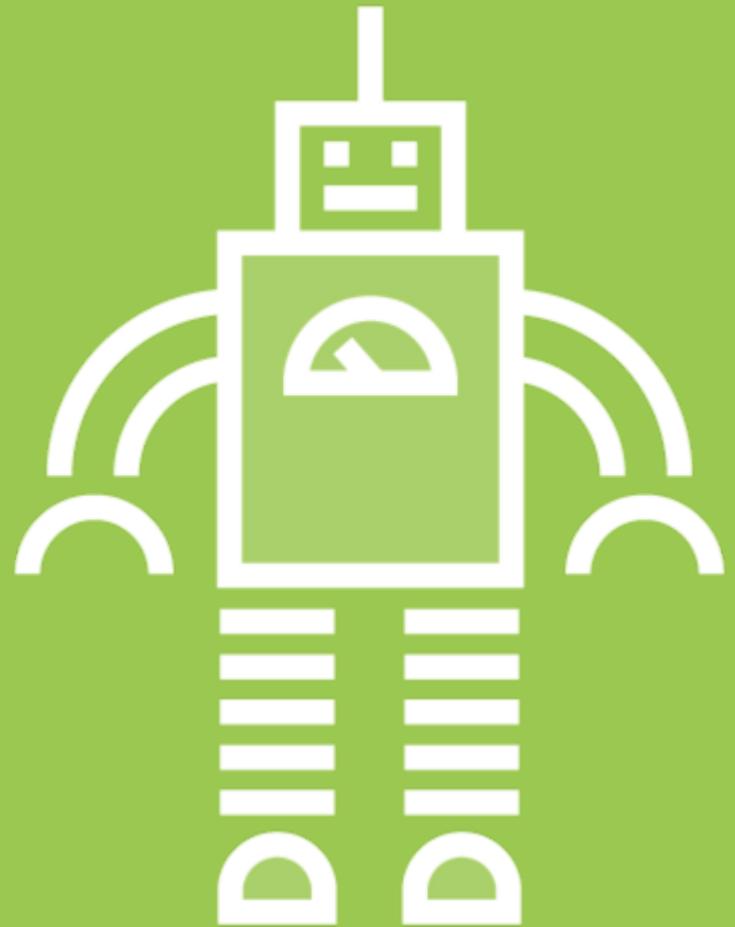
## Manual End-to-end Testing

**Hours spent manually clicking through application**

**Risky and leads to several uncaught bugs**

**Tedious, error prone, and slow**



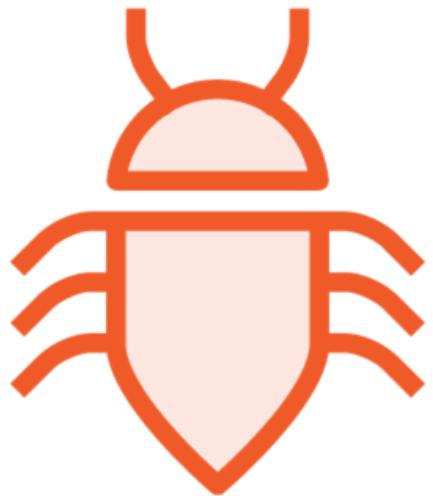


## Automated End-to-end Testing

Automated tests that test an application from start to finish, by simulating a real user scenario.



# End-to-end Testing



Catches bugs early on  
with excellent  
coverage



Saves hours spent on  
manual testing



High quality software  
for clients



# What Is Cypress?

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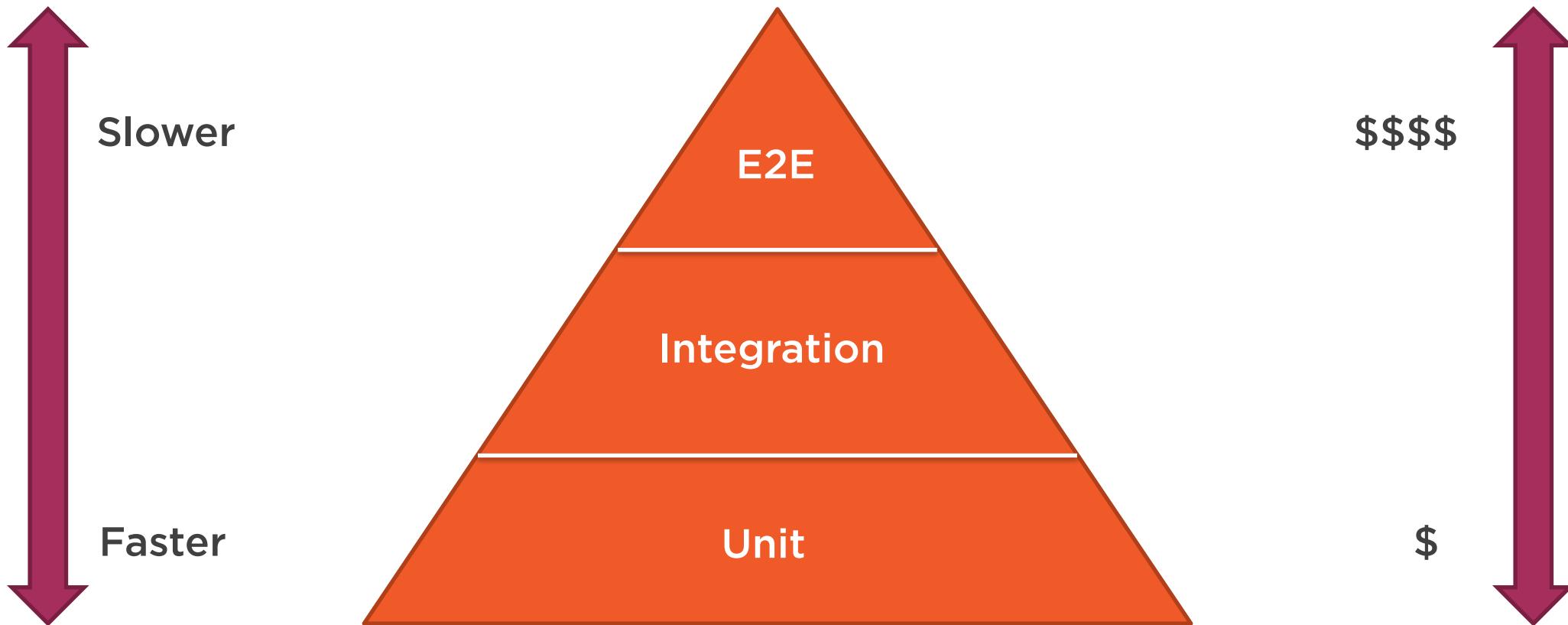


## What is Cypress?

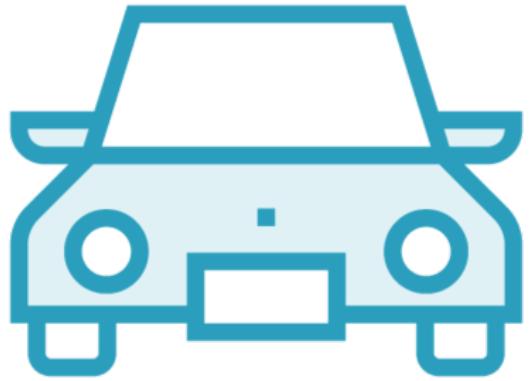
**Fast, easy, and reliable end-to-end testing  
for anything that runs on the browser**



# Test Automation Pyramid



# Cypress Changes The Status Quo



← → ⌂ [github.com/cypress-io/cypress](https://github.com/cypress-io/cypress) ⭐ ⌂ A :

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Fast, easy and reliable testing for anything that runs in a browser. <https://www.cypress.io>

test testing testing-tools test-suite test-automation test-runner tests javascript-tests cypress end-to-end-testing e2e-testing  
e2e-tests

12,608 commits 626 branches 0 packages 195 releases 140 contributors MIT

Branch: develop New pull request Create new file Upload files Find file Clone or download

flotwig Cypress v4.0 (#4226) ... Latest commit c9bccf2 1 hour ago

.github	Update issue template to be more specific about providing a fai... (#6086)	last month
.vscode	Add Firefox support (#1359)	2 hours ago
__snapshots__	[internal] use webpack for builds (#4103)	7 months ago
cli	Add Firefox support (#1359)	2 hours ago
packages	Add Firefox support (#1359)	2 hours ago
scripts	Add Firefox support (#1359)	2 hours ago

# Cypress Features



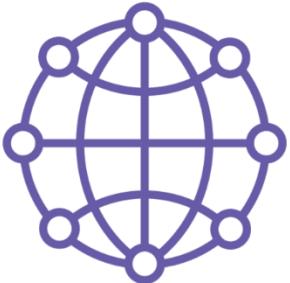
Time Travel & Debugging



Spies, Stubs, Clocks



Automatic Waiting



Network Traffic Control



Reliable & Fast



Screenshots & Videos



Cypress provides a complete end-to-end testing experience that can test anything that runs on the browser



# Readable Cypress Code

```
describe('My First Test', function() {  
  it('Visits the Kitchen Sink', function() {  
    cy.visit('https://example.cypress.io')  
  })  
})
```

Cypress tests are easy to read. Not intended to test applications you don't control.

# How Is Cypress Different?

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# End-to-end Testing

## Before Cypress

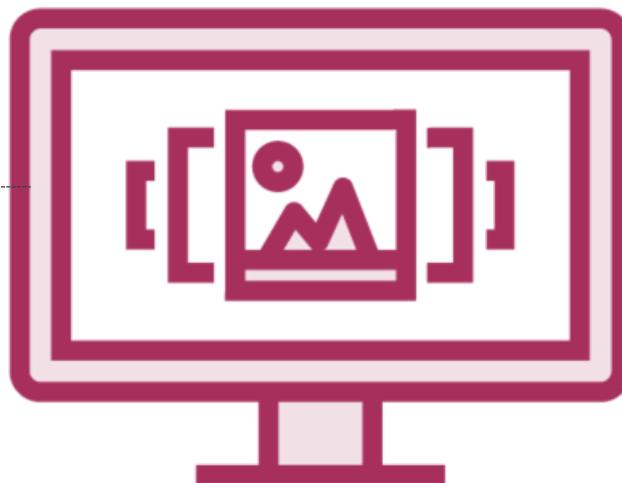
Framework (Mocha, Jasmine, Karma)

Assertion Library (Chai, Expect.js)

Install Selenium

Selenium Wrapper (Protractor, Nightwatch)

Other (Sinon, TestDouble)



## With Cypress

Cypress

Contains them all in one testing framework.

Source: [Cypress.io](https://cypress.io)



# Let's Learn More



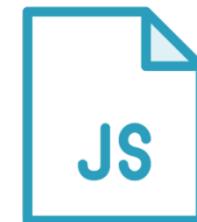
All in one inclusive testing framework



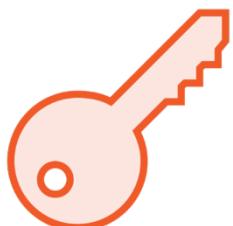
Works on any frontend framework or website



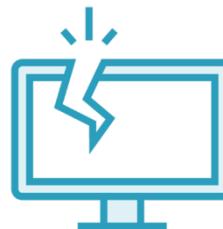
It is for both Developers and QA Engineers



Written only in JavaScript



Has native access to everything



Cypress is not flaky



# Trade-offs

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No framework is perfect!

# Runs Inside The Browser



**Impossible for Cypress to miss elements**

**JavaScript is the only supported language**

**No Node or any server side language**

**Harder to communicate with backend**

**Use `cy.exec()`, `cy.task()`, `cy.request()`**



A screenshot of a web browser window with two tabs open. The active tab is a Google search results page for the query "google". The search bar shows "google" and has a "Search" button. Below the search bar are navigation links for "All", "News", "Videos", and "Images". The main content area displays approximately 13,880,000,000 results found in 0.69 seconds. The top result is a link to "www.google.com" with the text "Google" and a green checkmark icon. Below it, there are links for "Google Accounts" (with a McAfee SECURE badge), "Google News", "Images", and a "More results from google.com »" link.

## No multi-tabs support

- Cypress runs on the browser
- Never have this support

## No reason to test browser's native behavior

**Do not test the stuff that doesn't need testing**



# Same Origin Tests Only



Cannot visit two domains of different origin  
in same test



# Same Origin Examples

```
it ('navigates', () => {
  cy.visit('https://facebook.com')
  cy.visit('https://cypress.io') // error
})

// Split visiting different origins, to a new test
it ('navigates to origin 1', () => {
  cy.visit('https://facebook.com') // works
})

it ('navigates to origin 2', () => {
  cy.visit('https://cypress.io') // works
})
```





## Temporary Trade-Offs

- There is no native or mobile events support
- Limited iframe support
- Workarounds for lack of `cy.hover()`
- No `cy.tab()` command
- Testing file uploads/downloads is app specific



# Summary



**End-to-end testing and Benefits**

**Overview of Cypress Architecture**

**Benefits**

**Trade-Offs**



# Up Next:

## Writing and Running Your First Tests

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