Why Cypress?

What you'll learn

- The solutions Cypress provides for testing
- The features of Cypress App, Cypress Cloud, UI Coverage, and Cypress Accessibility
- Our mission and what we believe in
- Key differences between Cypress and other testing tools

In a nutshell

Cypress is a next generation front end testing tool built for the modern web. We address the key pain points teams face when testing modern applications and maintaining test suites.

Our users are typically developers, QA engineers, and teams looking to build web applications and increase the quality of their existing applications.

Cypress provides solutions for:

- End-to-end testing
- Component testing
- Accessibility testing
- UI Coverage
- and more...

Cypress can test anything that runs in a browser and surface insights into how to improve the health of your test suite and the quality of your application.

Products

- Cypress App, a free, open source, locally installed app for writing and running tests.
- Cypress Cloud, a paid service for recording tests, surfacing test results, and providing test analytics.
- UI Coverage, a paid add-on providing a visual overview of test coverage across every page and component of your app, offering clear insights into uncovered areas that everyone can understand.
- Cypress Accessibility, a paid add-on providing accessibility checks, which helps detect barriers for people with disabilities using your application.

Cypress is a robust solution that can improve the quality of your application.

- **First:** Cypress helps you set up and start writing tests every day while you build your application locally. *Test Driven Development at its best!*
- **Next:** After building up a suite of tests and integrating Cypress with your CI Provider, Cypress Cloud can record your test runs surfacing exactly what happened during the test in Test Replay. You'll never have to wonder: *Why did this fail?*
- **Finally:** Add on Cypress Accessibility to get continuous feedback on accessibility issues and regressions, and UI Coverage to ensure you've tested every part of your application.

Features

Below are listed some of the key features of each product.

Cypress App

- **Time Travel:** Cypress takes snapshots as your tests run. Hover over commands in the Command Log to see exactly what happened at each step.
- **Debuggability:** Stop guessing why your tests are failing. Debug directly from familiar tools like Developer Tools. Our readable errors and stack traces make debugging lightning fast.
- **Automatic Waiting:** Never add waits or sleeps to your tests. Cypress automatically waits for commands and assertions before moving on. No more async hell.
- **Spies, Stubs, and Clocks:** Verify and control the behavior of functions, server responses, or timers. The same functionality you love from unit testing

is right at your fingertips.

- **Network Traffic Control:** Easily control, stub, and test edge cases without involving your server. You can stub network traffic however you like.
- **Consistent Results:** Our architecture doesn't use Selenium or WebDriver. Say hello to fast, consistent and reliable tests that are flake-free.
- **Cross Browser Testing:** Run tests within Firefox and Chrome-family browsers (including Edge and Electron) locally and in a Continuous Integration pipeline.

Cypress Cloud

- **Test Replay:** Record to Cypress Cloud and replay the test exactly as it executed during the run for zero-configuration debugging using Test Replay.
- **Smart Orchestration:** Once you're set up to record to Cypress Cloud, easily parallelize your test suite, rerun failed specs first with Spec Prioritization, and cancel test runs on failures with Auto Cancellation for tight feedback loops.
- **Flake Detection:** Discover and diagnose unreliable tests with Cypress Cloud's Flaky test management.
- **Branch Review:** Quickly identify the impact a pull request might have on your test suite in a single view using Branch Review. Compare which tests are failing, flaky, pending, added, or modified between the source and base branches and prevent the merging of low-quality code.
- **Integrations:** Integrate with GitHub, GitLab, or Bitbucket to see test results directly on every push or pull request. Cypress Cloud also integrates with Slack, Jira, and Microsoft Teams to keep your team in the loop.
- **Test Analytics:** Track test results over time with Test Analytics to identify trends, regressions, and improvements in your test suite. Use our Data Extract API to extract the data that is important to your team.

UI Coverage

- **Visualize Coverage:** UI Coverage provides a visual overview of test coverage across every page and component of your app, offering clear insights into uncovered areas that everyone can understand.
- **Results API:** Use the UI Coverage Results API to programmatically access test coverage data and integrate it into your existing workflows.

Cypress Accessibility

- **Accessibility Checks:** Maximize the value of your existing Cypress tests by instantly adding thousands of accessibility checks with no setup, code changes, or performance penalty.
- **Run-level reports:** Get a detailed report of accessibility issues found in your test runs with Run-level reports.
- **Results API:** Use the Cypress Accessibility's Results API to programmatically access Accessibility results in a CI environment.

Solutions

Cypress can be used to ensure several different types of test. This can provide even more confidence that your application under test is working as intended and accessible to all users.

End-to-end Testing

Cypress was originally designed to run end-to-end (E2E) tests on anything that runs in a browser. A typical E2E test visits the application in a browser and performs actions via the UI just like a real user would.

```
it('adds todos', () => {
  cy.visit('https://example.cypress.io/')
  cy.get('[data-cy="new-todo"]').type('write tests{enter}')
  // confirm the application is showing one item
  cy.get('[data-cy="todos"]').should('have.length', 1)
})
```

Component Testing

Cypress Component Testing provides a component workbench for you to quickly build and test components from multiple front-end UI libraries — no matter how simple or complex.

Learn more about how to test components for React, Angular, Vue, and Svelte.

React Angular Vue Svelte

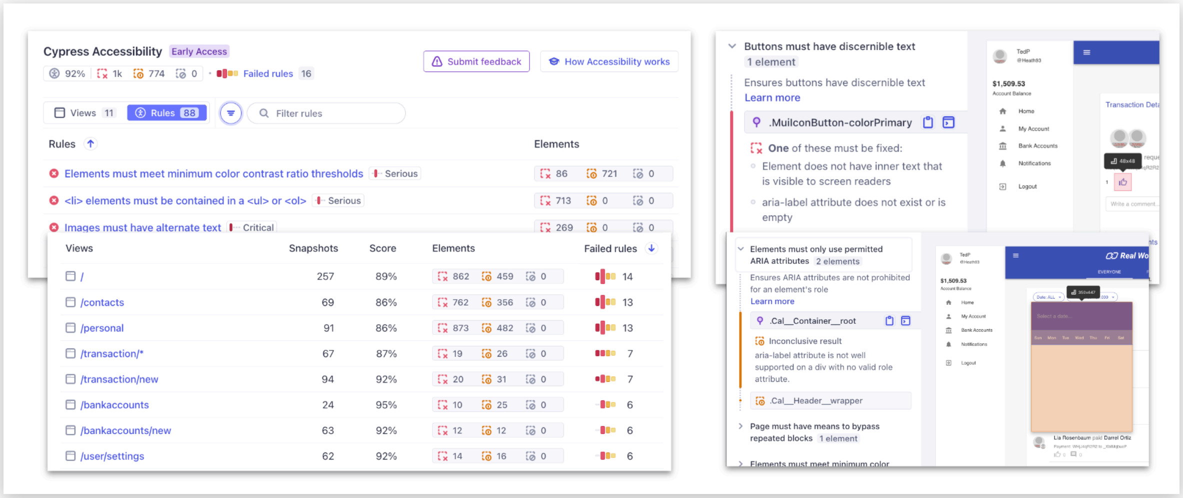
```
import Button from './Button'

it('uses custom text for the button label', () => {
  cy.mount(<Button>Click me!</Button>)
  // Assert that a button component has the correct text
  cy.get('button').should('contains.text', 'Click me!')
})
```

Accessibility Testing

You can write Cypress tests to check the accessibility of your application, and use plugins to run broad accessibility scans. When combined with Cypress Accessibility in Cypress Cloud, insights can be surfaced when specific accessibility standards are not met through your testing - with no configuration required. See our Accessibility Testing guide for more details.

```
it('adds todos', () => {
  cy.visit('https://example.cypress.io/')
  cy.get('img#logo')
    // Assert that an image has the correct alt text
    .should('have.attr', 'alt', 'Cypress Logo')
})
```



92% 1k 774 0 · Failed rules 16

Rules	Elements
Elements must meet minimum color contrast ratio thresholds (Serious)	86 721 0
<li> elements must be contained in a <ul> or <ol> (Serious)	713 0 0
Images must have alternate text (Critical)	269 0 0

Views	Snapshots	Score	Elements	Failed rules
/	257	89%	862 459 0	14
/contacts	69	86%	762 356 0	13
/personal	91	86%	873 482 0	13
/transaction/*	67	87%	19 26 0	7
/transaction/new	94	92%	20 31 0	7
/bankaccounts	24	95%	10 25 0	6
/bankaccounts/new	63	92%	12 12 0	6
/user/settings	62	92%	14 16 0	6

Buttons must have discernible text 1 element
Ensures buttons have discernible text
Learn more
.MuiIconButton-colorPrimary
One of these must be fixed:
- Element does not have inner text that is visible to screen readers
- aria-label attribute does not exist or is empty

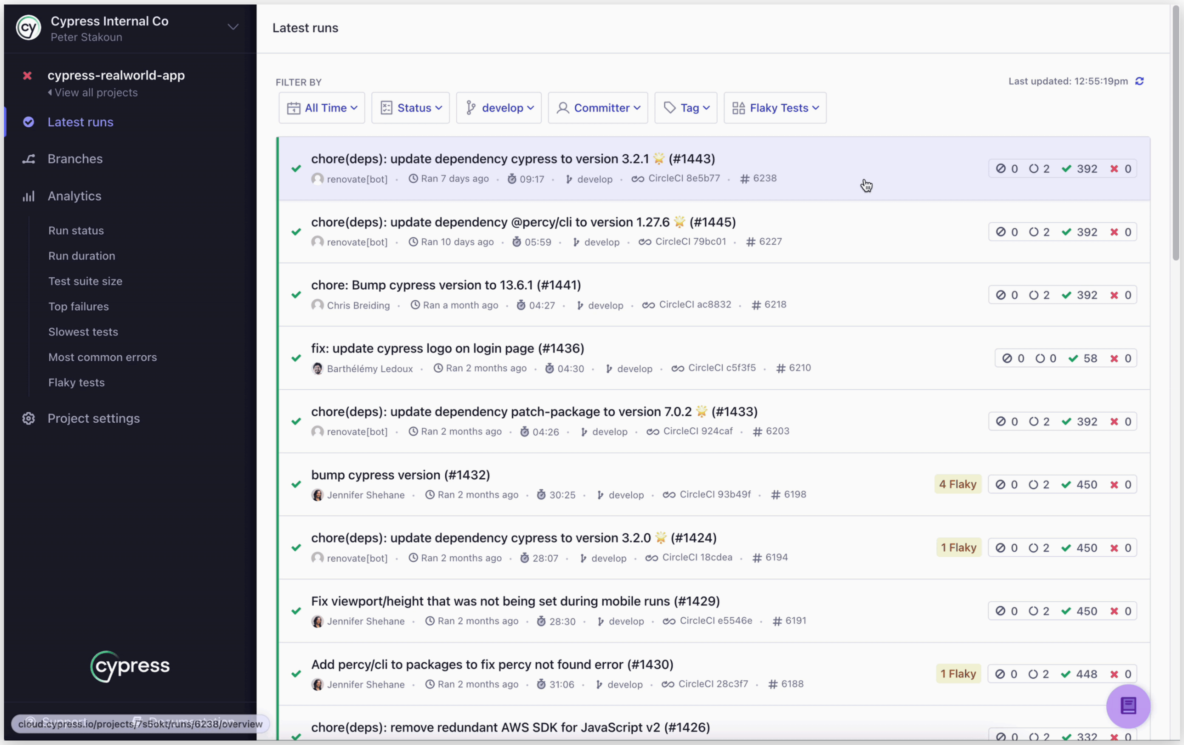
Elements must only use permitted ARIA attributes 2 elements
Ensures ARIA attributes are not prohibited for an element's role
Learn more
.Cal__Container__root
Inconclusive result
aria-label attribute is not well supported on a div with no valid role attribute.
.Cal__Header__wrapper

Page must have means to bypass repeated blocks 1 element

Elements must meet minimum color

UI Coverage

You can increase release confidence by closing testing gaps in critical app flows using UI Coverage. Leverage data-driven insights to cover untested areas, reduce incidents, and improve app quality.



Latest runs

Last updated: 12:55:19pm

chore(deps): update dependency cypress to version 3.2.1 (#1443)
renovate[bot] · Ran 7 days ago · 09:17 · develop · CircleCI 8e5b77 · # 6238 — 0 2 392 0

chore(deps): update dependency @percy/cli to version 1.27.6 (#1445)
renovate[bot] · Ran 10 days ago · 05:59 · develop · CircleCI 79bc01 · # 6227 — 0 2 392 0

chore: Bump cypress version to 13.6.1 (#1441)
Chris Breiding · Ran a month ago · 04:27 · develop · CircleCI ac8832 · # 6218 — 0 2 392 0

fix: update cypress logo on login page (#1436)
Barthélémy Ledoux · Ran 2 months ago · 04:30 · develop · CircleCI c5f3f5 · # 6210 — 0 0 58 0

chore(deps): update dependency patch-package to version 7.0.2 (#1433)
renovate[bot] · Ran 2 months ago · 04:26 · develop · CircleCI 924caf · # 6203 — 0 2 392 0

bump cypress version (#1432)
Jennifer Shehane · Ran 2 months ago · 30:25 · develop · CircleCI 93b49f · # 6198 — 4 Flaky 0 2 450 0

chore(deps): update dependency cypress to version 3.2.0 (#1424)
renovate[bot] · Ran 2 months ago · 28:07 · develop · CircleCI 18cdea · # 6194 — 1 Flaky 0 2 450 0

Fix viewport/height that was not being set during mobile runs (#1429)
Jennifer Shehane · Ran 2 months ago · 28:30 · develop · CircleCI e5546e · # 6191 — 0 2 450 0

Add percy/cli to packages to fix percy not found error (#1430)
Jennifer Shehane · Ran 2 months ago · 31:06 · develop · CircleCI 28c3f7 · # 6188 — 1 Flaky 0 2 448 0

chore(deps): remove redundant AWS SDK for JavaScript v2 (#1426)
0 2 332 0

cloud.cypress.io/projects/7s5okt/runs/6238/overview

Other

Cypress can perform arbitrary HTTP calls, thus you can use it for API testing.

```
it('adds a todo', () => {
  cy.request('POST', '/todos', { title: 'Write API Tests' })
    .its('body')
    .should('contain', { title: 'Write API Tests' })
})
```

And through a large number of official and 3rd party plugins you can write many other types of tests!

Our mission

Our mission is to build a thriving testing solution that enhances productivity, makes testing an enjoyable experience, and generates developer happiness. We hold ourselves accountable to champion a testing process **that actually works**.

We believe our documentation should be approachable. This means enabling our readers to understand fully not just the **what** but the **why** as well.

We want to help developers build a new generation of modern applications faster, better, and without the stress and anxiety associated with managing tests. We aim to elevate the art of software development by leveraging test results to generate actionable insights for long-term stability by proactively identifying areas for improvement.

We know that in order for us to be successful we must enable, nurture, and foster an ecosystem that thrives on open source. Every line of test code is an investment in **your codebase**, it will never be coupled to us as a paid service or company. Tests will be able to run and work independently, *always*.

We believe testing needs a lot of ❤️ and we are here to build a tool, a service, and a community that everyone can learn and benefit from. We're solving the hardest pain points shared by every developer working on the web. We believe in this mission and hope that you will join us to make Cypress a lasting ecosystem that makes everyone happy.

Key Differences

Architecture

Most testing tools (like Selenium) operate by running outside of the browser and executing remote commands across the network. *Cypress is the exact opposite.* Cypress is executed in the same run loop as your application.

Behind Cypress is a Node server process. Cypress and the Node process constantly communicate, synchronize, and perform tasks on behalf of each other. Having access to both parts (front and back) gives us the ability to respond to your application's events in real time, while at the same time work outside of the browser for tasks that require a higher privilege.

Cypress ultimately controls the entire automation process from top to bottom, which puts it in the unique position of being able to understand everything happening in and outside of the browser. This means Cypress is capable of delivering more consistent results than any other testing tool.

Because Cypress is installed locally on your machine, it can additionally tap into the operating system for automation tasks. This makes performing tasks such as taking screenshots, recording videos, general file system operations and network operations possible.

Native access

Because Cypress operates within your application, that means it has native access to every single object. Whether it is the `window`, the `document`, a DOM element, your application instance, a function, a timer, a service worker, or anything else - you have access to it in your Cypress tests.

For instance you can:

- Stub the browser or your application's functions and force them to behave as needed in your test case.
- Expose data stores so you can programmatically alter the state of your application directly from your test code.
- Test edge cases like 'empty views' by forcing your server to send empty responses.
- Test how your application responds to errors on your server by modifying response status codes to be 500.
- Modify DOM elements directly - like forcing hidden elements to be shown.
- Use 3rd party plugins programmatically. Instead of fussing with complex UI widgets like multi selects, autocompletes, drop downs, tree views or calendars, you can call methods directly from your test code to control them.
- Prevent Google Analytics from loading *before* any of your application code executes when testing.
- Get synchronous notifications whenever your application transitions to a new page or when it begins to unload.
- Control time by moving forward or backward so that timers or polls automatically fire without having to wait for the required time in your tests.
- Add your own event listeners to respond to your application. You could update your application code to behave differently when under tests in Cypress. You can control WebSocket messages from within Cypress,

conditionally load 3rd party scripts, or call functions directly on your application.
- For Component Tests, Cypress is browser-based, allowing you to test not only your component's functionality but also styles and appearance. You can visually see your component in action and interact with it in the app.

Shortcuts

Cypress allows for browser context to be cached with `cy.session()`. This means as a user, you only need to perform authentication once for the entirety of your test suite, and restore the saved session between each test. That means you do not have to visit a login page, type in a username and password and wait for the page to load and/or redirect for every test you run. You can accomplish this once with `cy.session()` and if needed, `cy.origin()`.

Flake resistant

Cypress knows and understands everything that happens in your application synchronously. It is notified the moment the page loads and the moment the page unloads. Cypress even knows how fast an element is animating and will wait for it to stop animating. Additionally, it automatically waits for elements to become visible, to become enabled, and to stop being covered. When pages begin to transition, Cypress will pause command execution until the following page is fully loaded. You can also tell Cypress to wait on specific network requests to finish.

Debuggability

Above all else Cypress is built for usability.

- There are hundreds of custom error messages describing the exact reason Cypress failed your test.
- There is a rich UI which visually shows you the command execution, assertions, network requests, spies, stubs, page loads, or URL changes.
- The Cypress App takes snapshots of your application and enables you to time travel back to the state it was in when commands ran.
- You can use the Developer Tools while your tests run to see every console message or network request. You can inspect elements and use debugger

statements in your spec or application code - you can use all the tools you're already comfortable with. This enables you to test and develop all at the same time.

Trade offs

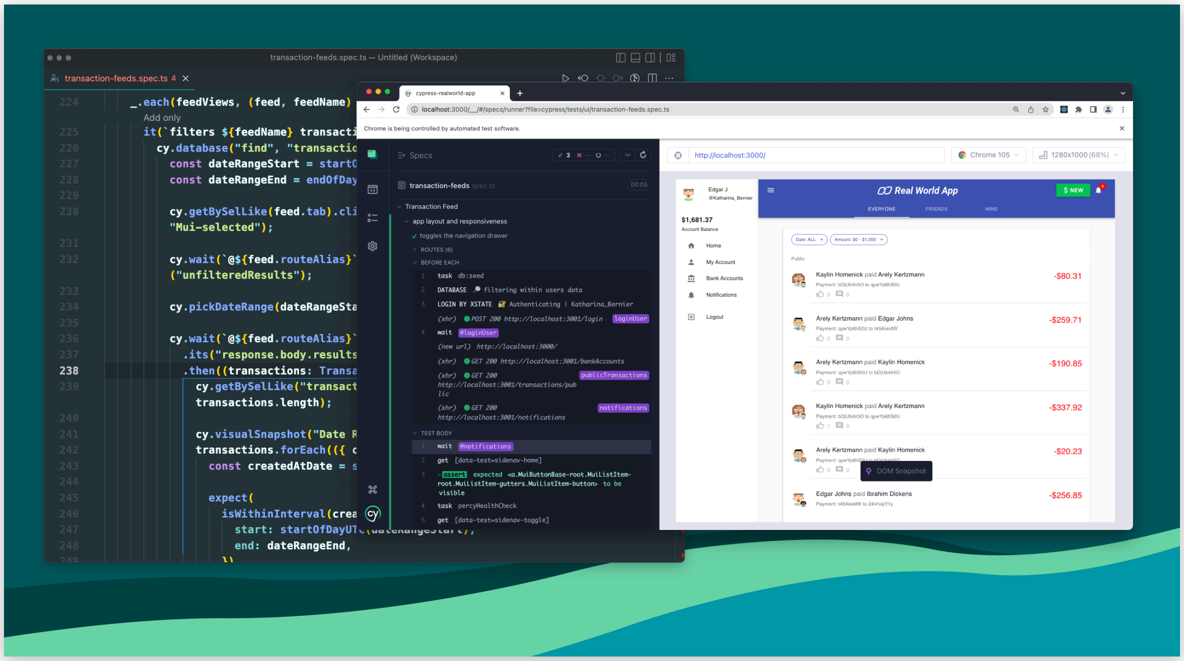
While there are many new and powerful capabilities of Cypress - there are also important trade-offs that we've made in making this possible.

If you're interested in understanding more, we've written an entire guide on this topic.

Get Started

Install Cypress so you can quickly see your first passing test within minutes for End-to-end tests or Component tests.

Cypress in the Real World


transaction-feeds.spec.ts — Untitled (Workspace)
transaction-feeds.spec.ts 4
Add only

```
    _.each(feedViews, (feed, feedName)
      it(`filters ${feedName} transacti
        cy.database("find", "transactio
          const dateRangeStart = startO
          const dateRangeEnd = endOfDay

          cy.getBySelLike(feed.tab).cli
          "Mui-selected");

          cy.wait(`@${feed.routeAlias}`
          ("unfilteredResults");

          cy.pickDateRange(dateRangeSta

          cy.wait(`@${feed.routeAlias}`
            .its("response.body.results
            .then((transactions: Transa
              cy.getBySelLike("transact
              transactions.length);

              cy.visualSnapshot("Date R
              transactions.forEach(({ c
                const createdAtDate = s

                expect(
                  isWithinInterval(crea
                    start: startOfDayUT
                    end: dateRangeEnd,
```

localhost:3000/__/#/specs/runner?file=cypress/tests/ui/transaction-feeds.spec.ts

Chrome is being controlled by automated test software.

```
BEFORE EACH
1  task  db:seed
2  DATABASE  filtering within users data
3  LOGIN BY XSTATE  Authenticating | Katharina_Bernier
   (xhr)  POST 200 http://localhost:3001/login  loginUser
4  wait  @loginUser
   (new url)  http://localhost:3000/
   (xhr)  GET 200 http://localhost:3001/bankAccounts
   (xhr)  GET 200                        publicTransactions
   http://localhost:3001/transactions/pub
   lic
   (xhr)  GET 200                        notifications
   http://localhost:3001/notifications
TEST BODY
1  wait  @notifications
2  get  [data-test=sidenav-home]
3  -assert  expected <a.MuiButtonBase-root.MuiListItem-
   root.MuiListItem-gutters.MuiListItem-button> to be
   visible
4  task  percyHealthCheck
5  get  [data-test=sidenav-toggle]
```

$1,681.37
Account Balance

Kaylin Homenick paid Arely Kertzmann -$80.31
Payment: bDjUb4ir5O to qywYp6hS0U

Arely Kertzmann paid Edgar Johns -$259.71
Payment: qywYp6hS0U to t45AiwidW

Arely Kertzmann paid Kaylin Homenick -$190.85
Payment: qywYp6hS0U to bDjUb4ir5O

Kaylin Homenick paid Arely Kertzmann -$337.92
Payment: bDjUb4ir5O to qywYp6hS0U

Arely Kertzmann paid Kaylin Homenick -$20.23

Edgar Johns paid Ibrahim Dickens -$256.85
Payment: t45AiwidW to 24VniajY1y

Cypress makes it quick and easy to start testing, and as you begin to test your app, **you'll often wonder if you're using best practices or scalable strategies**.

To guide the way, the Cypress team has created the Real World App (RWA), a full stack example application that demonstrates testing with **Cypress in practical**

and realistic scenarios.

The RWA achieves full code-coverage with end-to-end tests across multiple browsers and device sizes, but also includes visual regression tests, API tests, unit tests, and runs them all in an efficient CI pipeline. Use the RWA to **learn, experiment, tinker, and practice** web application testing with Cypress.

The app is bundled with everything you need, just clone the repository and start testing.

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