

# Automated Web Accessibility Testing with axe-webdriverjs

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# What is Web Accessibility

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“Web accessibility means that websites, tools, and technologies are designed and developed so that people with disabilities can use them. More specifically, people can:

- perceive, understand, navigate, and interact with the Web
- contribute to the Web”

~Web Accessibility Initiative (WAI)

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# Challenges of Web Accessibility Testing

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- > Web Content Accessibility Guidelines (WCAG)
  - WCAG “quick reference” has over 70 guidelines
- > W3C (World Wide Web Consortium) started an unofficial draft on the Challenges with WCAG Conformance and Testing
- > Screen readers can be intimidating for new users





# What is aXe

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## axe-core

- > Open source engine behind various accessibility test tools such as Google Lighthouse and Accessibility Insights for Web



# What is aXe Web Driver JS

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## axe-webdriverjs

- > Chainable API to execute axe-core
- > Produces report in JSON format



# How Are We Using Axe



Development

- Angular app
- Protractor tests with axe



Source Code Management

- Trigger build
- Prevents code with failed tests to be merged

CI Server

- Runs tests

# Setup axe-webdriverjs

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## Add axe-webdriverjs to package.json

```
> "devDependencies": {  
    "axe-webdriverjs": "^2.2.0" }
```





# Write axe-webdriverjs Test

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## Add function to run axe-webdriverjs

```
runAccessibilityChecks () {
  const AxeBuilder = require('axe-webdriverjs');
  const util = require('util');

  AxeBuilder(browser.driver)
    .withTags(['wcag2a', 'wcag2aa'])
    .analyze()
    .then(results => {
      expect(results.violations.length).toBe(0, '\n' +
util.inspect(results.violations, false, null, true));
    })
    .catch(err => {
      console.log('Error running accessibility report: ' + err);
    });
}
```



# Add to Existing Test Suite

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Add test to existing e2e test suite for every page

```
describe('Page for Demo', () => {  
  
  beforeEach(() => {  
    browser.get(browser.baseUrl);  
  });  
  
  it('should have no accessibility violations', () => {  
    runAccessibilityChecks();  
  });  
}
```



# Setup Travis CI

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## Add travis.yml

```
language: node_js
```

```
addons:
```

```
  chrome: stable
```

```
script: ng e2e
```



# GitHub Branch Protection

## Protect matching branches

**Require pull request reviews before merging**

When enabled, all commits must be made to a non-protected branch and submitted via a pull request with the required number of approving reviews and no changes requested before it can be merged into a branch that matches this rule.

Required approving reviews: 1 ▼

**Dismiss stale pull request approvals when new commits are pushed**

New reviewable commits pushed to a matching branch will dismiss pull request review approvals.

**Require review from Code Owners**

Require an approved review in pull requests including files with a designated code owner.

**Restrict who can dismiss pull request reviews**

Specify people or teams allowed to dismiss pull request reviews.

**Require status checks to pass before merging**

Choose which [status checks](#) must pass before branches can be merged into a branch that matches this rule. When enabled, commits must first be pushed to another branch, then merged or pushed directly to a branch that matches this rule after status checks have passed.

**Require branches to be up to date before merging**

This ensures pull requests targeting a matching branch have been tested with the latest code. This setting will not take effect unless at least one status check is enabled (see below).

Status checks found in the last week for this repository

Codacy/PR Quality Review

continuous-integration/travis-ci


Required

coverage/coveralls

**Require signed commits**

# Failed Test Example

## Failed test in Travis CI prevents code merge

uw-it-edm / content-services-ui  build passing

Current Branches Build History Pull Requests > [Build #6899](#) More options





**✗ feature/a11y-demo** negative test for demo purposes ✗ #6899 failed

- Commit 347e4aa
- Compare 347e4aa8063c
- Branch feature/a11y-demo
- Huai Chan

Ran for 7 min 12 sec  
Total time 16 min 46 sec  
2 months ago

[Build jobs](#) [View config](#)

**✗ Test** 7 min 12 sec

✓ # 6899.1	AMD64		</> Node.js: lts/*	job=yarn run= test-cover= TZ=America/Los	3 min 18 sec
✓ # 6899.2	AMD64		</> Node.js: lts/*	job=yarn test= TZ=Europe/Brussels	2 min 49 sec
✗ # 6899.3	AMD64		</> Node.js: lts/*	job=yarn e2e-local=	7 min 12 sec
✓ # 6899.4	AMD64		</> Node.js: lts/*	job=yarn build= --prod= --configuration=tr	3 min 27 sec

# Resources

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- > EDM Github [uw-it-edm/content-services-ui](#)
- > [axe-core API documentation](#)
- > [Rules](#) checked by axe-core
- > [Accessibility Testing with axe-webdriverjs](#) by Marcy Sutton



# Thank You

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