

# .NET Conf

# 2022



# Building Accessible Apps with .NET MAUI

Rachel Kang (she/her)



Over 1 billion people  
currently experience  
some form of disability

	Permanent	Temporary	Situational
Touch			
			
	One arm	Arm injury	New parent
See			
			
	Blind	Cataract	Distracted driver
Hear			
			
	Deaf	Ear infection	Bartender
Speak			
			
	Non-verbal	Laryngitis	Heavy accent

## The Persona Spectrum

We use the Persona Spectrum to understand related mismatches and motivations across a spectrum of permanent, temporary, and situational scenarios. It's a quick tool to help foster empathy and to show how a solution scales to a broader audience.

<https://www.microsoft.com/design>

Designing for accessibility is not limited  
to people experiencing disabilities

**The best solutions**

**benefit everyone**

Marketing Sync



22:05



Leave



Beth Davies



Babak Shamma

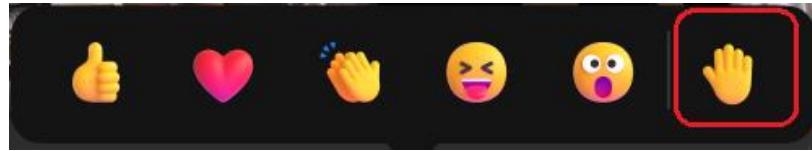


Hillary Reyes



Babak Shamma:

So what did you all think of today's kickoff meeting for the new building project?



## Participants

...



Invite someone or dial a number



Share invite

▼ In this meeting (3)

 Aadi Kapoor 1  

 Aaron Buxter 2  

 Daniela Mandera  
Organizer  

▼ Others invited (14)

 Babak Shammas  
Accepted

 Beth Davies  
Accepted

 Bruno Zhao  
Tentative

 August Bergmaa  
Tentative

Home

Find a setting 

## Personalization

Background

Colors

Lock screen

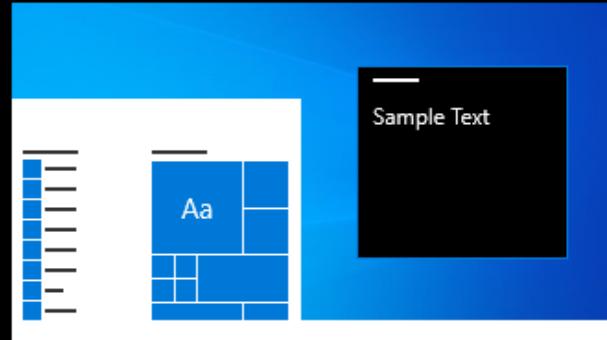
Themes

Fonts

Start

Taskbar

## Colors



### Choose your color

Custom 

### Choose your default Windows mode

Light

Dark

### Choose your default app mode

Light

Dark

Transparency effects

Related Settings

[High contrast settings](#)

[Sync your settings](#)

[Help from the web](#)

[Changing desktop or background colors](#)

[Changing taskbar color](#)

 [Get help](#)

 [Give feedback](#)

# Dropped curbs



# Huge business opportunity

worth hundreds of billions



<https://wearepurple.org.uk/the-purple-pound-infographic>

# Legal consequences Growing number of

## legal consequences

POLITICS

### Supreme Court hands victory to blind man who sued Domino's over site accessibility

PUBLISHED MON, OCT 7 2019 9:40 AM EDT | UPDAT



Tucker Higgins  
@IN/TUCKER-HIGGINS-5B162295/  
@TUCKERHIGGINS

ON SMALL BUSINESS

## U.S. Businesses Get Hit With Record Numbers of Disability Lawsuits

By Amy Yee | Bloomberg

April 14, 2022 at 5:03 p.m. EDT

FOOD // WINE, BEER & SPIRITS

50 Bay Area wineries got hit with disability lawsuits. The winemakers say they're 'predatory'



Esther Mobley

# Approaching Accessible Apps

- **Empathy** is the name of the game
- Explore accessibility settings and features
  - Screen readers
  - Device theming
  - Font sizes
  - Color contrast
  - etc.
- Research accessibility models and APIs
- Test and leverage available tools/resources



With .NET MAUI,  
you'll be able to  
create accessible  
apps more  
seamlessly than  
ever before

#9557 by PureWeen was merged 18 days ago • Approved

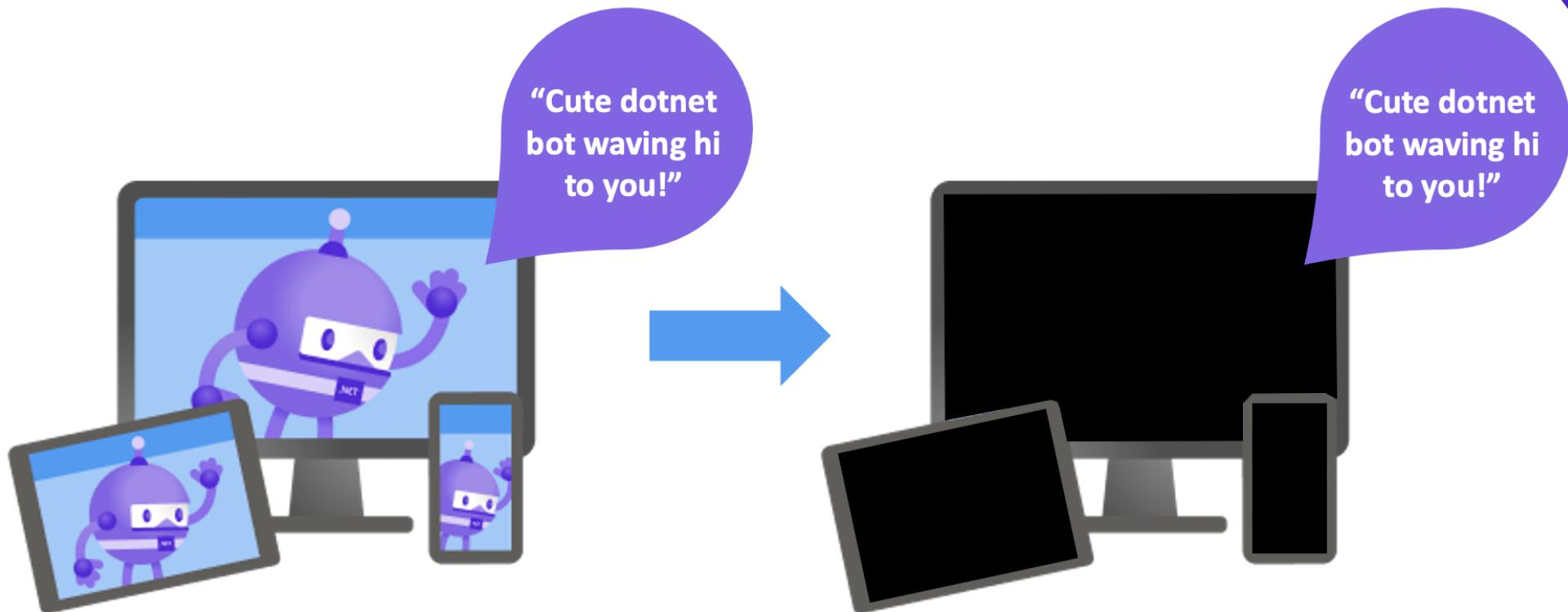
- [Fix SearchBar semantics ✓ area/a11y area/controls control-entry](#)  
#7802 by rachelkang was merged on 8 Jun • Approved → 6.0-sr2
- [\[Windows\] Set WinUI picker description to title ✓ area/a11y area/controls control-picker platform](#)  
#6970 by rachelkang was merged on 9 May • Approved
- [Only set AccessibilityTraits for heading when it matters ✓ area/a11y](#)  
#6749 by PureWeen was merged on 2 May • Approved
- [Tweak templates to fix accessibility bugs ✗ area/a11y area/templates](#)  
#6322 by rachelkang was merged on 20 Apr • Approved → 6.0.300
- [Update template styles ✗ area/a11y area/templates area/Xaml </>](#)  
#6312 by rachelkang was merged on 21 Apr • Approved → 6.0.300-rc.3
- [Remove interfering keyboard focus logic ✓ area/a11y area/controls area/shell control-entry](#)  
#6246 by rachelkang was merged on 25 Apr • Approved → 6.0.300-rc.3
- [Create custom Automation Peer for MauiButton ✓ area/a11y area/controls control-button](#)  
#6139 by PureWeen was merged on 18 Apr • Approved
- [Respect UserAppTheme in RequestedTheme ✓ area/a11y t/bug](#)  
#5071 by mattleibow was merged on 6 Mar • Approved → 6.0.300-previe...
- [Windows FlowDirection ✓ area/a11y](#)  
#4936 by PureWeen was merged on 1 Mar • Approved ↴ 18 tasks → 6.0.300-previe...
- [\[iOS\] Implement IsFocused property and Focus\(\), Unfocus\(\) methods ✓ area/a11y platform/iOS](#)  
#4588 by jsuarezruiz was merged on 17 Feb • Approved ⚡ 1 of 2 tasks
- [\[Android\] Implement IsFocused property and Focus\(\), Unfocus\(\) methods ✓ area/a11y platform](#)  
#4587 by jsuarezruiz was merged on 17 Feb • Approved ⚡ 1 of 2 tasks
- [\[Windows\] Implement IsFocused property and Focus\(\), Unfocus\(\) methods ✓ area/a11y platform](#)  
#4562 by jsuarezruiz was merged on 19 Feb • Approved ⚡ 1 of 2 tasks
- [\[Android\] Fix SetSemanticFocus ✗ area/a11y platform/android](#)  
#3993 by rachelkang was merged on 20 Jan • Approved ↴ 12 tasks
- [Fix keyboard navigation with modal pages ✓ area/a11y](#)  
#3631 by PureWeen was merged on 16 Dec 2021 • Approved ↴ 18 tasks

# 10 AWESOME THINGS

about .NET MAUI accessibility 😊

# Semantic Properties

1



# Semantic Properties

1

SemanticProperties.Description

SemanticProperties.Hint

SemanticProperties.HeadingLevel

```
<Image Source="logo.png"  
      SemanticProperties.Description=".NET logo" />
```

```
Image image = new Image { Source = "logo.png" };  
SemanticProperties.SetDescription(image, ".NET logo");
```

# Semantic Extensions

A large blue circle containing the white number '2'.

SetSemanticFocus()

Announce()

```
Image image = new Image { Source = "logo.png" };  
image.SetSemanticFocus();
```

```
SemanticScreenReader.Announce("I am being announced!");
```

# Community Toolkit

3

SemanticEffects

SemanticOrderView

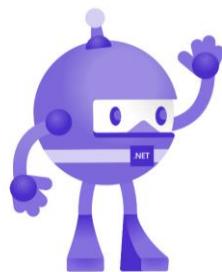
```
<xct:SemanticOrderView x:Name="sov">
    <StackLayout>
        <Label x:Name="second" Text="Second control" />
        <Button x:Name="third" Text="Third control" />
        <Label x:Name="fourth" Text="Fourth control" />
        <Button x:Name="fifth" Text="Fifth control" />
        <Button x:Name="first" Text="First control" />
    </StackLayout>
</xct:SemanticOrderView>
```

```
sov.ViewOrder = new List<View> { first, second, third, fourth, fifth };
```

<https://github.com/CommunityToolkit/Maui>

# App Theming

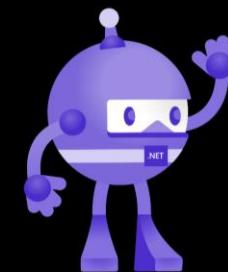
4



Hello, World!

Welcome to .NET Multi-platform App UI

Click me



Hello, World!

Welcome to .NET Multi-platform App UI

Click me

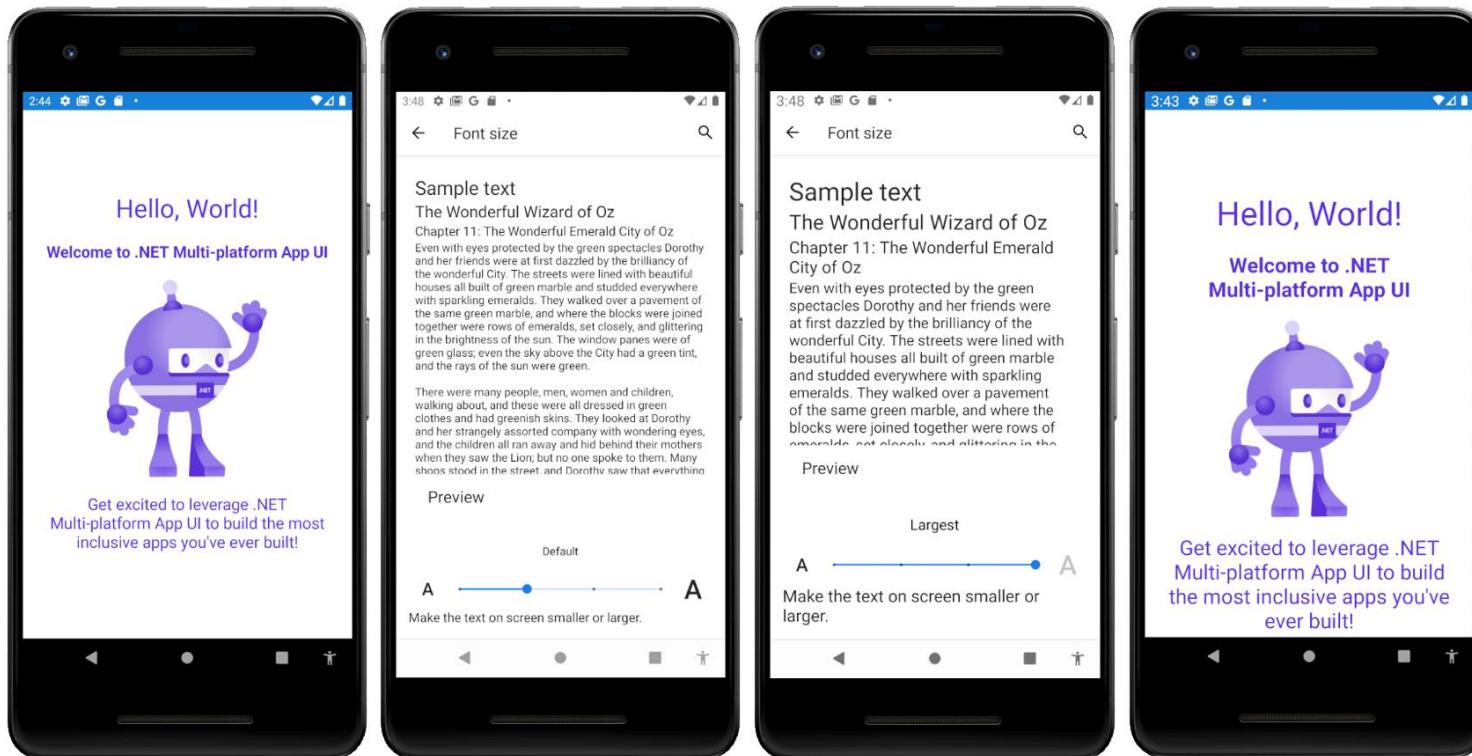
<Setter

```
Property="BackgroundColor"  
Value="{AppThemeBinding  
Light={StaticResource White},  
Dark={StaticResource Black}}" />
```

# Font Autoscaling

5

## FontAutoScalingEnabled



# Built-in Accessibility

6

Apply Accessibility traits to controls that have TapGestureRecogniz

Merged PureWeen merged 7 commits into [release/6.0.1xx-preview7](#) from [node\\_info\\_alternate](#) on 2 Aug 2021

Conversation 6 Commits 7 Checks 14 Files changed 17

PureWeen commented on 30 Jul 2021 · edited Member

**Description of Change**

If users attach a touch gesture recognizer that will activate with a single touch then we add accessibility traits that will inform readers that the element is clickable.

Add traits to iOS Checkbox so it reads as Switch #1832

Merged PureWeen merged 4 commits into [main](#) from [ios\\_accessible\\_checkbox](#) on 27 Jul 2021

Conversation 0 Commits 4 Checks 14 Files changed 2

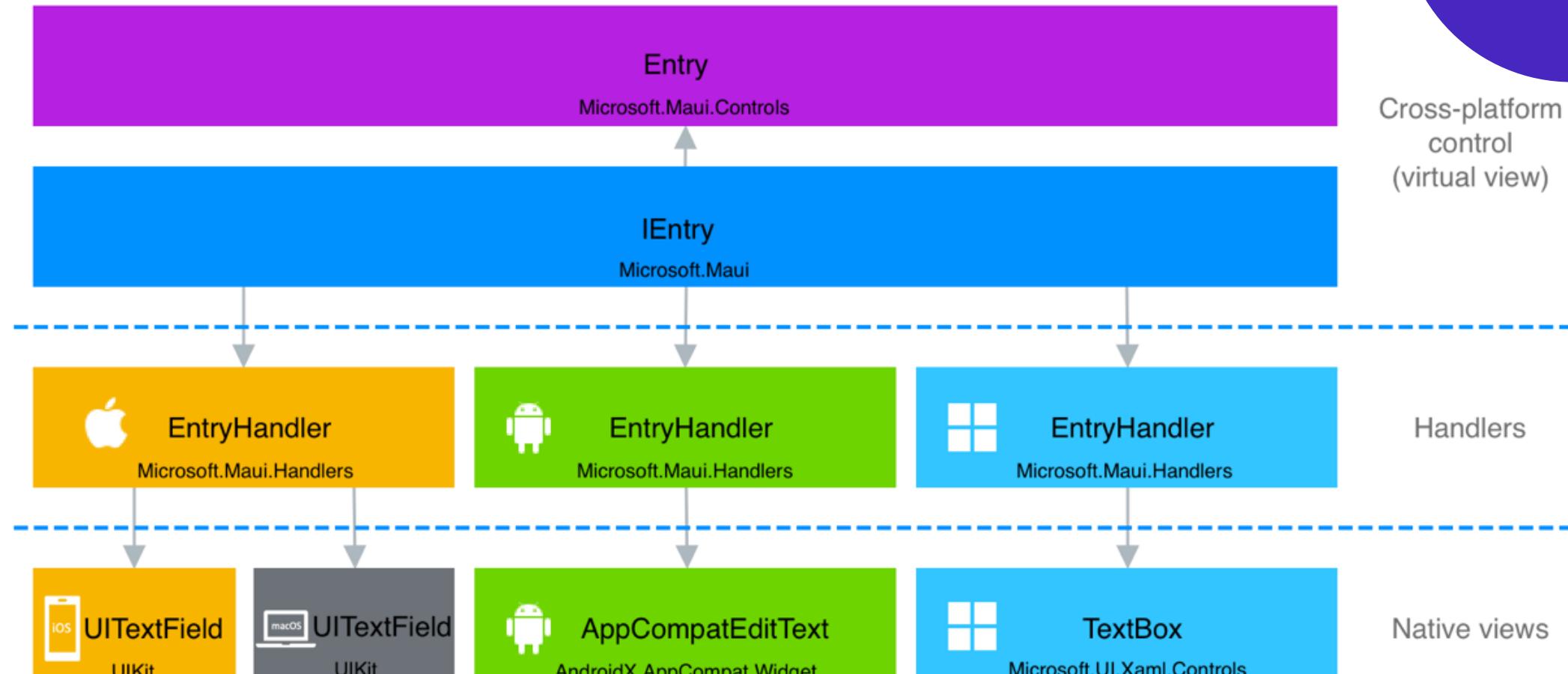
PureWeen commented on 27 Jul 2021 · edited Member

**Description of Change**

iOS doesn't natively have a checkbox so to make the current checkbox more accessible we will treat it semantically like a switch

# Customization via Handlers

7



# Customization via Handlers

7

```
Microsoft.Maui.Handlers.EntryHandler.Mapper.AppendToMapping  
("MyEntry", (handler, view) =>  
{  
#if ANDROID  
    // Android code  
  
#elif IOS || MACCATALYST  
    // iOS code  
  
#elif WINDOWS  
    // WinUI code  
#endif  
});
```

# Accessibility Standards



8

- Microsoft Accessibility Standards (MAS)
- Web Content Accessibility Guidelines (WCAG)

## Perceivable

*Information and user interface components must be presentable to users in ways they can perceive.*

- Text alternatives
- Time-based media
- Adaptable
- Distinguishable

## Operable

*User interface components and navigation must be operable.*

- Keyboard accessible
- Time limits
- Seizures and physical reactions
- Navigable
- Input modalities

## Understandable

*Information and the operation of user interface must be understandable.*

- Readable
- Predictable
- Input assistance

## Robust

*Content must be robust enough that it can be interpreted by ...assistive technologies.*

- Compatible

# Accessibility Insights

Accessibility Insights

FastPass

1 Automated checks

2 Tab stops

3 Needs review

Needs review

Sometimes automated checks identify *possible* accessibility problems that need to be reviewed and verified by a human.

Instances to review 1

Collapse all Visual helper

ImageContrastCheck: Meaningful graphics must have sufficient contrast.

Resources for this rule

More information about ImageContrastCheck

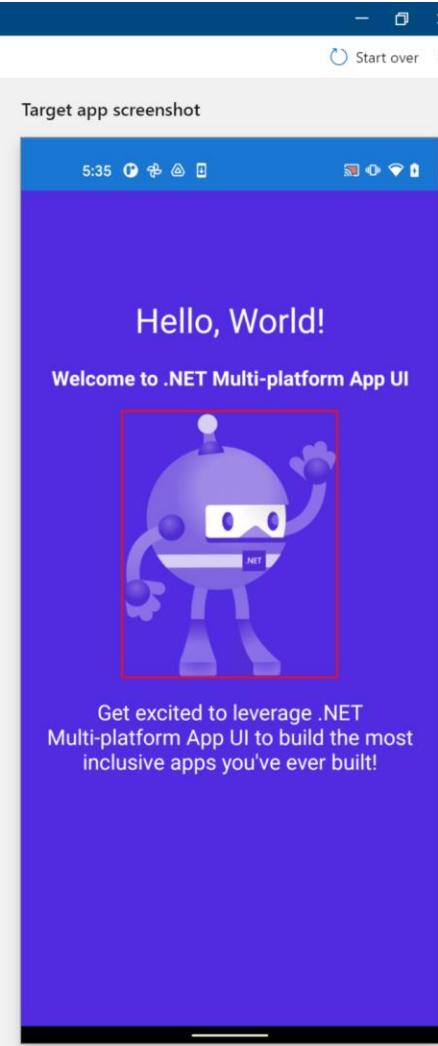
WCAG 1.4.11 New for WCAG 2.1

Class name android.widget.ImageView

Content description Cute dot net bot waving hi to you!

How to check Use Accessibility Insights for Windows (or the Colour Contrast Analyser if you're testing on a Mac) to manually verify that the ImageView has sufficient contrast compared to the background. If the background is an image or gradient, test an area where the contrast appears to be the lowest.

Highlight visible



9

# Accessibility Insights

The screenshot shows the Accessibility Insights application interface. On the left, a sidebar lists three categories: 'FastPass' (Automated checks), 'Tab stops', and 'Needs review' (which is selected and highlighted with a blue border). The main content area displays a 'Needs review' report for a target app. The report includes a heading 'Needs review', a note about automated checks identifying possible accessibility problems, and a section titled 'Instances to review' which shows '0' instances found. A 'Congratulations!' message states there are no instances to review, encouraging manual testing. Below this is a cartoon cat icon with a magnifying glass. To the right, a 'Target app screenshot' shows a mobile device displaying the text 'Hello, World!' and 'Welcome to .NET Multi-platform App UI'. It features a purple robot character. A caption below the screenshot reads: 'Get excited to leverage .NET Multi-platform App UI to build the most inclusive apps you've ever built!'

9

# Accessibility Insights

9

"My Recipe" button looks like Disabled control but it is not. #6598

 Closed SuryacharanM opened this issue on 28 Apr · 2 comments

[Edit](#) [New issue](#)

SuryacharanM commented on 28 Apr · edited

GitHubTags:  
#A11yUsable; #.NET MAUI; #AILimited; #A11ySev4; #A11yTCS; #Android; #AndroidPhone; #GH\_.NETMAUI\_Apr2022;

**Description**  
"My Recipe" button looks like Disabled control but it is not disabled.

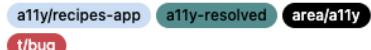
**Steps to Reproduce**

1. Install and open ".NET MAUI" app.
2. "Home Screen" will open.
3. Swipe till "My Recipe" and observe the issue.



Breakfast Lunch Dinner Sna

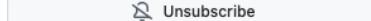
**Assignees**  


**Labels**  


**Projects**  
None yet

**Milestone**  
6.0-servicing

**Development**  
[Create a branch](#) for this issue or link a pull request.

**Notifications** [Customize](#)  
  
You're receiving notifications because you were assigned.

**Search by diet**



Balanced Vegetarian Vegan Keto

 [Recipe Search](#)

 [My Recipes](#)

# DEMO TIME!



# The Journey Continues!

10

Docs / .NET / .NET MAUI /



## Build accessible apps with semantic properties

Article • 24/08/2022 • 15 minutes to read • 3 contributors



Semantics for accessibility is concerned with building experiences that make your apps inclusive for people who use technology in a wide range of environments and approach your UI with a range of needs and experiences. In many situations, legal requirements for accessibility may provide an impetus for developers to address accessibility issues. Regardless, it's advisable to build inclusive and accessible apps so that your apps reach the largest possible audience.

The [Web Content Accessibility Guidelines \(WCAG\)](#) are the global accessibility standard and legal benchmark for web and mobile. These guidelines describe the various ways in which apps can be made more perceivable, operable, understandable, and robust, for all.

<https://docs.microsoft.com/dotnet/maui/fundamentals/accessibility>

# The Journey Continues!

10

The Journey to Accessible Apps

 April 14th, 2021

No matter what stage of the app development process you're at, and no matter your level of familiarity with developing inclusive apps, it is always the right time to make your apps more inclusive. Get started on your journey to developing inclusive apps today.

Ensuring your apps are inclusive has wide implications. It involves making sure that your app appeals to audiences of all different identities – of age, gender, ethnicity, ability, education, and so much more. It involves making sure all your app's users are granted an equitable user experience. It involves executing proper customer validation and working with a representative team.

With all these moving parts, it can be tough to know where to start – but fear not! You can start here, with accessibility, today.

the following ways:

that provides an may entirely replace the elementary in many e of sighted users, even

t individuals may ties to accomplish tasks, fferent situations. Assistive

<https://devblogs.microsoft.com/xamarin/the-journey-to-accessible-apps>

# The Journey Continues!

10



[#maui-accessibility](https://aka.ms/discord-maui)

# Thank you!

-  @therachelkang
-  @rachelkang
-  <https://aka.ms/discord-maui> > #maui-accessibility

