

# W3C Web Content Accessibility Guidelines (WCAG) 2.1 Conformance Statement

Product Release Date: April 2, 2019

Name of Product: Visual Studio 2019

Description of Product: Visual Studio is a rich, integrated development environment for creating stunning applications for Windows, Android, and iOS, as well as modern web applications and cloud services. The information here pertains to all SKUs of Visual Studio including Community, Professional, Enterprise and any service required to use the product.

Platform: Win32

Accessibility website: [Microsoft Accessibility](http://www.microsoft.com/accessibility)

Contact for more information: [Enterprise Disability Answer Desk (eDAD)](https://support.microsoft.com/accessibility/enterprise-answer-desk)

For assistance with this report, please email us.

## WCAG 2.1 Conformance Requirements

| **Criteria**  |
| --- |
| [1. Conformance Level](https://www.w3.org/TR/WCAG21/#cc1) |
| [2. Full pages](https://www.w3.org/TR/WCAG21/#cc2) |
| [3. Complete processes](https://www.w3.org/TR/WCAG21/#cc3) |
| [4. Only Accessibility-Supported Ways of Using Technologies](https://www.w3.org/TR/WCAG21/#cc4) |
| [5. Non-Interference](https://www.w3.org/TR/WCAG21/#cc5) |

## Web Content Accessibility Guidelines (WCAG) 2.1

## Principle 1: Perceivable

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

### Guideline 1.1 Text Alternatives

Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **1.1.1 Non-text Content:** All non-text content that is presented to the user has a text alternative that serves the equivalent purpose, except in situations listed in [WCAG 2.1 1.1.1](https://www.w3.org/TR/WCAG21/#non-text-content). | Supported With Exceptions | Some non-text buttons in the Xamarin iOS designer do not have tooltips that are accessible to keyboard-only users. |

### Guideline 1.2 Time-based Media

Provide alternatives for time-based media.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **1.2.1 Audio-only and Video-only (Prerecorded):** For prerecorded audio-only and prerecorded video-only media, the following are true, except when the audio or video is a media alternative for text and is clearly labeled as such:• Prerecorded Audio-only: An alternative for time-based media is provided that presents equivalent information for prerecorded audio-only content.• Prerecorded Video-only**:** Either an alternative for time-based media or an audio track is provided that presents equivalent information for prerecorded video-only content. | Not Applicable |  |
| **1.2.2 Captions (Prerecorded):** Captions are provided for all prerecorded audio content in synchronized media, except when the media is a media alternative for text and is clearly labeled as such. | Not Applicable |  |
| **1.2.3 Audio Description or Media Alternative (Prerecorded):** An alternative for time-based media or audio description of the prerecorded video content is provided for synchronized media, except when the media is a media alternative for text and is clearly labeled as such. | Not Applicable |  |
| **1.2.4 Captions (Live):** Captions are provided for all live audio content in synchronized media. | Not Applicable |  |
| **1.2.5 Audio Description (Prerecorded):** Audio description is provided for all prerecorded video content in synchronized media. | Not Applicable |  |

### Guideline 1.3 Adaptable

Create content that can be presented in different ways (for example simpler layout) without losing information or structure.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **1.3.1 Info and Relationships:** Information, structure, and relationships conveyed through presentation can be programmatically determined or are available in text. | Supported With Exceptions | Debugging states such as Started, Stopped, Paused, and Resumed that are implied visually in Visual Studio, are not exposed programmatically to assistive technology. Customers relying on screen readers will not receive notifications that debugging has started, stopped, or entered break state. Users can read Visual Studio's title bar to determine if debugging is active or not - "Debugging" will be in the title if debugging. To determine if the debugged application is in break mode, look for the "Show Next Statement" menu item in the Debug top level menu - if it is present, the debugger is in a break state.When a “No Symbol Loaded” page is shown when the user hit a break, the user can add path to the symbol search path box. There are suggestions in the dropdown when the user types in the path. However, screen reader doesn’t announce the suggestions. The users rely on screen reader will not get notified about the notification. However, users can use arrow up/down keys to navigate the suggestions in the dropdown. Screen reader will announce the item.There are a few different accessibility issues in “Tools” -> "Options" -> “Debugging” -> “Output Window” page. For example, when the focus is at the name of the option, narrator announces the control type as “Button”, which is not really a button. When the focus is at the value and the user changes the value, narrator doesn’t announce the new value. The keyboard navigation isn’t intuitive. The user has to focus on the name of the option before moving to the next option.There are several different accessibility issues with the Pull Members Up dialog which is a new Roslyn code refactoring. For instance screen readers would read internal namespace information for members listed in the dialog.When the user inspects the Modules window in debugging, the screen reader doesn't announce the sorting action that're performed on the table. It doesn't read the header for the cell value in the table.When the user uses search in Locals, Autos, and Watch window, the user may not know that the search has a dropdown via assistive technology.Screen reader doesn't read the second column in Autos, Locals, and Watch window. |
| **1.3.2 Meaningful Sequence:** When the sequence in which content is presented affects its meaning, a correct reading sequence can be programmatically determined. | Supported With Exceptions | When the user uses advanced navigation in Narrator on the table in the Modules window, the Narrator focus is not logical while navigating using CAPS+Arrow keys.When the user uses Narrator in scan mode on Autos, Locals, and Watch window, the Narrator doesn't read the content in a meaningful way. |
| **1.3.3 Sensory Characteristics:** Instructions provided for understanding and operating content do not rely solely on sensory characteristics of components such as shape, size, visual location, orientation, or sound. | Supported |  |
| **1.3.4 Orientation:** Content does not restrict its view and operation to a single display orientation, such as portrait or landscape, unless a specific display orientation is essential. | Not Evaluated |  |
| **1.3.5 Identify Input Purpose:** The purpose of each input field collecting information about the user can be programmatically determined when:• The input field serves a purpose identified in the Input Purposes for User Interface Components section; and• The content is implemented using technologies with support for identifying the expected meaning for form input data. | Not Evaluated |  |

### Guideline 1.4 Distinguishable

Make it easier for users to see and hear content including separating foreground from background.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **1.4.1 Use of Color:** Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element. | Supported |  |
| **1.4.2 Audio Control:** If any audio on a Web page plays automatically for more than 3 seconds, either a mechanism is available to pause or stop the audio, or a mechanism is available to control audio volume independently from the overall system volume level. | Not Applicable |  |
| **1.4.3 Contrast (Minimum):** The visual presentation of text and images of text has a contrast ratio of at least 4.5:1, except for the following: • Large Text: Large-scale text and images of large-scale text have a contrast ratio of at least 3:1;• Incidental: Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content, have no contrast requirement.• Logotypes: Text that is part of a logo or brand name has no minimum contrast requirement. | Supported With Exceptions | In the Xamarin iOS Simulator, the color contrast of many of the controls may make it difficult for some users to read text or see controls. Some icons on the VSTO FormRegion wizard do not meet High Contrast Standards |
| **1.4.4 Resize text:** Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality. | Supported |  |
| **1.4.5 Images of Text:** If the technologies being used can achieve the visual presentation, text is used to convey information rather than images of text except for the following: • Customizable: The image of text can be visually customized to the user's requirements;• Essential: A particular presentation of text is essential to the information being conveyed. | Supported |  |
| **1.4.10 Reflow:** Content can be presented without loss of information or functionality, and without requiring scrolling in two dimensions for:• Vertical scrolling content at a width equivalent to 320 CSS pixels;• Horizontal scrolling content at a height equivalent to 256 CSS pixels;Except for parts of the content which require two-dimensional layout for usage or meaning. | Not Evaluated |  |
| **1.4.11 Non-Text Contrast:** The visual presentation of the following have a contrast ratio of at least 3:1 against adjacent color(s):**User Interface Components**• Visual information used to indicate states and boundaries of user interface components, except for inactive components or where the appearance of the component is determined by the user agent and not modified by the author;**Graphical Objects**• Parts of graphics required to understand the content, except when a particular presentation of graphics is essential to the information being conveyed. | Not Evaluated |  |
| **1.4.12 Text Spacing:** In content implemented using markup languages that support the following text style properties, no loss of content or functionality occurs by setting all of the following and by changing no other style property:• Line height (line spacing) to at least 1.5 times the font size;• Spacing following paragraphs to at least 2 times the font size;• Letter spacing (tracking) to at least 0.12 times the font size;• Word spacing to at least 0.16 times the font size. | Not Evaluated |  |
| **1.4.13 Content on Hover or Focus:** Where receiving and then removing pointer hover or keyboard focus triggers additional content to become visible and then hidden, the following are true:**Dismissable**A mechanism is available to dismiss the additional content without moving pointer hover or keyboard focus, unless the additional content communicates an input error or does not obscure or replace other content;**Hoverable**If pointer hover can trigger the additional content, then the pointer can be moved over the additional content without the additional content disappearing;**Persistent**The additional content remains visible until the hover or focus trigger is removed, the user dismisses it, or its information is no longer valid. | Not Evaluated |  |

## Principle 2: Operable

User interface components and navigation must be operable.

### Guideline 2.1 Keyboard Accessible

Make all functionality available from a keyboard.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **2.1.1 Keyboard:** All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes, except where the underlying function requires input that depends on the path of the user's movement and not just the endpoints. | Supported With Exceptions | Inserting controls from the toolbox to the Xamarin Forms Previewer/Code Editor is not currently possible with only a keyboard.It is not currently possible to obtain keyboard focus on the Platform, Device, Orientation and Zoom controls on the Xamarin Forms Previewer. In the Xamarin iOS Simulator, many controls are inaccessible to keyboard-only users. In many cases in Visual Studio, users cannot use keyboard to show the tooltip of a control. While inspecting a performance report from the profiler, users are not able to use the keyboard to navigate to all of the elements in the report. Screen reader users will have difficulty determining all the contents of the report.Users who rely on the Data Source selector for Web Forms may encounter issues with selecting an OLE DB provider. |
| **2.1.2 No Keyboard Trap:** If keyboard focus can be moved to a component of the page using a keyboard interface, then focus can be moved away from that component using only a keyboard interface, and, if it requires more than unmodified arrow or tab keys or other standard exit methods, the user is advised of the method for moving focus away. | Supported With Exceptions | While inspecting the Performance Tools options in the Tools -> Options dialog , users cannot use the Tab or Arrow keys exclusively to navigate the elements of the window and focus order is not consistent between Tab and Arrow keys. Screen reader users may not be able to determine the flow of the window.While inspecting a performance violation in an IntelliTrace file with performance data, users cannot use SHIFT+TAB to get out of the call tree once the focus is set on it. This is a keyboard trap for users with visual impairments who will find it difficult to navigate back from the call tree. However, the user can use TAB to get out of the call tree.Some users of the Xamarin Property Panel may experience a keyboard focus trap when navigating away from the search properties text view via tab navigation.In the Xamarin iOS Simulator, users may experience a keyboard focus trap in the zoom combo box. |
| **2.1.4 Character Key Shortcuts:** If a keyboard shortcut is implemented in content using only letter (including upper- and lower-case letters), punctuation, number, or symbol characters, then at least one of the following is true:**Turn off**A mechanism is available to turn the shortcut off;**Remap**A mechanism is available to remap the shortcut to use one or more non-printable keyboard characters (e.g. Ctrl, Alt, etc).**Active only on focus**The keyboard shortcut for a user interface component is only active when that component has focus. | Not Evaluated |  |

### Guideline 2.2 Enough Time

Provide users enough time to read and use content.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **2.2.1 Timing Adjustable:** For each time limit that is set by the content, at least one of the following is true: • Turn off: User is allowed to turn off time limit before encountering it; or • Adjust: The user is allowed to adjust the time limit before encountering it over a wide range that is at least ten times the length of the default setting; or• Extend: The user is warned before time expires and given at least 20 seconds to extend the time limit with a simple action (for example, "press the space bar"), and the user is allowed to extend the time limit at least ten times; or• Real-time Exception: The time limit is a required part of a real-time event (for example, an auction), and no alternative to the time limit is possible; or• Essential Exception: The time limit is essential and extending it would invalidate the activity; or • 20 Hour Exception: The time limit is longer than 20 hours. | Not Applicable |  |
| **2.2.2 Pause, Stop, Hide:** For moving, blinking, scrolling, or auto-updating information, all of the following are true:• Moving, blinking, scrolling: For any moving, blinking or scrolling information that (1) starts automatically, (2) lasts more than five seconds, and (3) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it unless the movement, blinking, or scrolling is part of an activity where it is essential; and• Auto-updating: For any auto-updating information that (1) starts automatically and (2) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it or to control the frequency of the update unless the auto-updating is part of an activity where it is essential. | Not Applicable |  |

### Guideline 2.3 Seizures

Do not design content in a way that is known to cause seizures.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **2.3.1 Three Flashes or Below Threshold:** Web pages do not contain anything that flashes more than three times in any one second period, or the flash is below the general flash and red flash thresholds. | Supported |  |

### Guideline 2.4 Navigable

Provide ways to help users navigate, find content, and determine where they are.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **2.4.1 Bypass Blocks:** A mechanism is available to bypass blocks of content that are repeated on multiple Web pages. | Not Applicable |  |
| **2.4.2 Page Titled:** Web pages have titles that describe topic or purpose. | Not Applicable |  |
| **2.4.3 Focus Order:** If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability. | Supported With Exceptions | In the Xamarin iOS Simulator, the focus order is incorrect for some of the controls. This may lead to confusing behavior for users who attempt to tab-navigate while using the Xamarin iOS Simulator. The keyboard focus is not correct in the Select Data Source Window Keyboard focus order is incorrect under the Debug tab in the project properties window. The focus loops within the Debug tab. |
| **2.4.4 Link Purpose (In Context):** The purpose of each link can be determined from the link text alone or from the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general. | Supported |  |
| **2.4.5 Multiple Ways:** More than one way is available to locate a Web page within a set of Web pages except where the Web Page is the result of, or a step in, a process. | Not Applicable |  |
| **2.4.6 Headings and Labels:** Headings and labels describe topic or purpose. | Supported |  |
| **2.4.7 Focus Visible:** Any keyboard operable user interface has a mode of operation where the keyboard focus indicator is visible. | Supported With Exceptions | Keyboard focus is not visible in the "Look in" list items pane When opening a memory heap analysis window from either the Diagnostic Tool Window's memory tool or the Debug Managed Memory dump debugging feature, the initial keyboard focus is set to a parent container that has the narrative text of the path to a file on disk. This will also happen when selecting a snapshot to diff against, or when the user tabs off of the last element in the view. This focus element can be disorienting to users, as they are not alerted to where the tool has taken them. In the meantime, pressing tab will return focus to the tool as expected.While inspecting a performance report from the profiler, the focus indicator can be lost when placed on elements in the report. Users who rely on the keyboard to operate the report will have difficulty determining the component on which keyboard operations will interact. |

### Guideline 2.5 Input Modalities

Make it easier for users to operate functionality through various inputs beyond keyboard.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **2.5.1 Pointer Gestures:** All functionality that uses multipoint or path-based gestures for operation can be operated with a single pointer without a path-based gesture, unless a multipoint or path-based gesture is essential. | Not Evaluated |  |
| **2.5.2 Pointer Cancellation:** For functionality that can be operated using a single pointer, at least one of the following is true:**No Down-Event**The down-event of the pointer is not used to execute any part of the function;**Abort or Undo**Completion of the function is on the up-event, and a mechanism is available to abort the function before completion or to undo the function after completion;**Up Reversal**The up-event reverses any outcome of the preceding down-event;**Essential**Completing the function on the down-event is essential. | Not Evaluated |  |
| **2.5.3 Label in Name:** For user interface components with labels that include text or images of text, the name contains the text that is presented visually. | Not Evaluated |  |
| **2.5.4 Motion Actuation:** Functionality that can be operated by device motion or user motion can also be operated by user interface components and responding to the motion can be disabled to prevent accidental actuation, except when:**Supported Interface**The motion is used to operate functionality through an accessibility supported interface;**Essential**The motion is essential for the function and doing so would invalidate the activity. | Not Evaluated |  |

## Principle 3: Understandable

Information and the operation of user interface must be understandable.

### Guideline 3.1 Readable

Make text content readable and understandable.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **3.1.1 Language of Page**: The default human language of each Web page can be programmatically determined. | Supported |  |
| **3.1.2 Language of Parts:** The human language of each passage or phrase in the content can be programmatically determined except for proper names, technical terms, words of indeterminate language, and words or phrases that have become part of the vernacular of the immediately surrounding text. | Not Applicable |  |

### Guideline 3.2 Predictable

Make Web pages appear and operate in predictable ways.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **3.2.1 On Focus:** When any component receives focus, it does not initiate a change of context. | Supported |  |
| **3.2.2 On Input:** Changing the setting of any user interface component does not automatically cause a change of context unless the user has been advised of the behavior before using the component | Supported |  |
| **3.2.3 Consistent Navigation:** Navigational mechanisms that are repeated on multiple Web pages within a set of Web pages occur in the same relative order each time they are repeated, unless a change is initiated by the user. | Not Applicable |  |
| **3.2.4 Consistent Identification:** Components that have the same functionality within a set of Web pages are identified consistently. | Supported |  |

### Guideline 3.3 Input Assistance

Help users avoid and correct mistakes.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **3.3.1 Error Identification:** If an input error is automatically detected, the item that is in error is identified and the error is described to the user in text. | Supported |  |
| **3.3.2 Labels or Instructions:** Labels or instructions are provided when content requires user input. | Supported |  |
| **3.3.3 Error Suggestion:** If an input error is automatically detected and suggestions for correction are known, then the suggestions are provided to the user, unless it would jeopardize the security or purpose of the content. | Supported |  |
| **3.3.4 Error Prevention (Legal, Financial, Data):** For Web pages that cause legal commitments or financial transactions for the user to occur, that modify or delete user-controllable data in data storage systems, or that submit user test responses, at least one of the following is true: 1. Reversible: Submissions are reversible.2. Checked: Data entered by the user is checked for input errors and the user is provided an opportunity to correct them.3. Confirmed: A mechanism is available for reviewing, confirming, and correcting information before finalizing the submission. | Supported |  |

## Principle 4: Robust

Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies.

### Guideline 4.1 Compatible

Maximize compatibility with current and future user agents, including assistive technologies.

| **Criteria** | **Supporting Feature** | **Remarks and Explanations** |
| --- | --- | --- |
| **4.1.1 Parsing:** In content implemented using markup languages, elements have complete start and end tags, elements are nested according to their specifications, elements do not contain duplicate attributes, and any IDs are unique, except where the specifications allow these features. | Supported With Exceptions | While inspecting a .NET allocation profiling report, users who rely on Narrator will not be able to interact with the application after unchecking/checking a context menu item. |
| **4.1.2 Name, Role, Value:** For all user interface components (including but not limited to: form elements, links and components generated by scripts), the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies. | Supported With Exceptions | Some controls on the Xamarin Forms Previewer do not have names that can be programmatically determined. Some elements of the Xamarin Property Panel have children with non-unique names and may be difficult to differentiate for visually-impaired users. Users who rely on Assistive Technologies may have difficulties using Workflow Designer Property Panel.Users who rely on Assistive Technologies may have difficulties using the Query Builder dialog.Users who rely on Assistive Technologies may have difficulties using the Access Permission list items on the Data Link Properties dialog.Users who rely on Assistive Technologies may have difficulties using Table Adapter Configuration Wizard.Users who rely on Assistive Technologies may have difficulties using Data Source Configuration Wizard.While inspecting a performance report from the profiler, some UI elements have poor values for accessibility properties. Data tables in the report aren't defined as tables, and expandable items in the report aren't defined as expandable, for example. Screen reader users will be unable to determine the state or nature of all the elements in the report.While inspecting the Diagnostic Tools window, focus can be set to one of two invisible elements in the window which both have long values for the Name property of each element. The values in each Name property include the full path to a file on disk ("file://C:\Program Files (x86)\Microsoft Visual Studio\2017\Enterprise\Common7\ IDE\ CommonExtensions\Platform\ DiagnosticsHub\ WebViews\ Performance DebuggerSwimLanesView.html" for example). Screen readers will ready the lengthy text of the Name property which is not related to the contents of the window. While inspecting a performance report from the profiler, some UI elements have poor values for accessibility properties. Data tables in the report aren't defined as tables, and expandable items in the report aren't defined as expandable, for example. Screen reader users will be unable to determine the state or nature of all the elements in the report.In debugging, the user can inspect the Thread window. But user using screen reader won’t know that the row is about a process group instead of a thread. Besides, there is a button to expand/collapse the threads that belong to the process. Screen reader doesn’t announce what the button is for. The button doesn’t have the property IsExpandCollapsePatternAvailable. Users using assistive technology won’t know that they can expand or collapse the threads.Users who rely on Assistive Technologies may have difficulties using the ASP.NET ListViewControl. |
| **4.1.3 Status Messages:** In content implemented using markup languages, status messages can be programmatically determined through role or properties such that they can be presented to the user by assistive technologies without receiving focus. | Not Evaluated |  |

## Disclaimer

© 2019 Microsoft Corporation. All rights reserved. The names of actual companies and products mentioned herein may be the trademarks of their respective owners. The information contained in this document represents the current view of Microsoft Corporation on the issues discussed as of the date of publication. Microsoft cannot guarantee the accuracy of any information presented after the date of publication.

This document includes material copied from or derived from the Web Content Accessibility Guidelines ([WCAG 2.1](https://www.w3.org/TR/WCAG21/)). Copyright © 2017-2018 W3C® (MIT, ERCIM, Keio, Beihang). This document is not the Web Content Accessibility Guidelines (WCAG) and should not be used as a substitute for it. Excerpts of WCAG are referenced solely for purposes of detailing Microsoft’s conformance with the relevant provisions. A full and complete copy of the Guidelines is available from the [W3C WAI](https://www.w3.org/WAI/).

Microsoft regularly updates its websites and provides new information about the accessibility of products as that information becomes available.

Customization of the product voids this conformance statement from Microsoft. Customers may make independent conformance statements if they have conducted due diligence to meet all relevant requirements for their customization.

Please consult with Assistive Technology (AT) vendors for compatibility specifications of specific AT products.

This document is for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS DOCUMENT.