

Writing Windows 11 Widgets

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Qudos .NET Meetup - 24th September 2024

About



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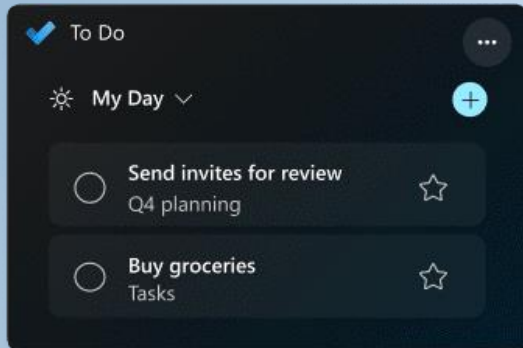
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Writing Windows 11 Widgets



Outline



About Windows 11 & Widgets

Design Widgets with Adaptive Cards

Develop Widgets with Windows App SDK

Design & Develop Widgets Demo

Overview & Any Questions?

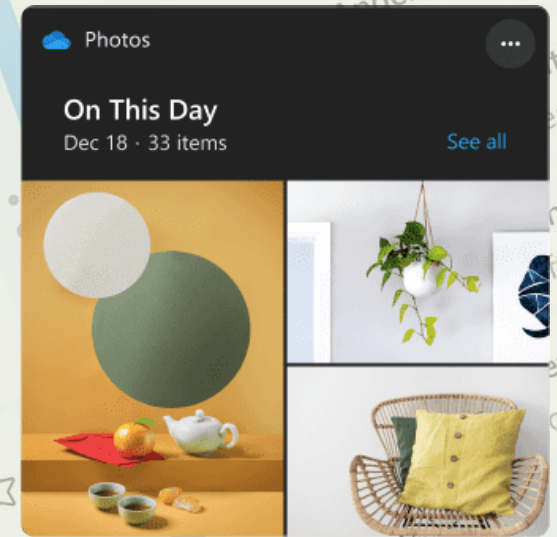


Writing Windows 11 Widgets

Windows 11 & Widgets



Writing Windows 11 Widgets



Windows 11



Windows 11 is Microsoft's latest most powerful operating system

Optimised for productivity & Dev Home for developers

Elevate gaming & entertainment experience

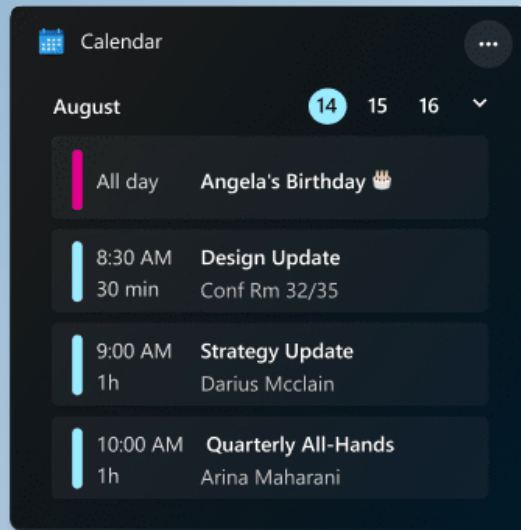
Enhanced with AI-powered Copilot

windows.com



Windows 11 & Widgets

Widgets



Widgets enable quick access & information at-a-glance

Organise & save time with the Widgets Board

Customise & personalise what is important

Interactive & dynamic text or graphics

Updated features & functionality



Windows 11 & Widgets

New card Select host app: Widgets Board Theme: Light Container size: Medium Host App Docs Templating Docs Undo Redo Copy card payload Target version: 1.6 Help

Preview mode

CARD ELEMENTS

Containers

Container
ImageSet
FactSet
ColumnSet
Carousel
Table

Elements

TextBlock
RichTextBlock
Image
Media
ActionSet

Inputs

Input.Text
Input.Date
Input.Time
Input.Number
Input.ChoiceSet

Widget Header

Publish Adaptive Card Schema



Matt Hiding

Created Tue, 14 Feb 2017

Now that we have defined the main rules and features of the format, we need to produce a schema and publish it to GitHub. The schema will be the starting point of our reference documentation.

CARD STRUCTURE

AdaptiveCard
TextBlock [\${title}]
ColumnSet [2 columns]
Column [Automatic]
Image
Column [Stretch]
TextBlock [\${creator.name}]
TextBlock [Created {{Date}}]
TextBlock [\${description}]
FactSet [\${key}:]
Action.ShowCard [Set due date]
Action.OpenUrl [View]

ELEMENT PROPERTIES

Nothing is selected

Select an element in the card to modify its properties.

Design Widgets with Adaptive Cards

Widget Header

Scoreboard



SHADES

Sat, 31 Aug 2019
Final

45 - 7



SKINS

CARD PAYLOAD EDITOR

```
1 {  
2   "type": "AdaptiveCard",  
3   "body": [  
4     {  
5       "type": "TextBlock",  
6       "size": "Medium",  
7       "weight": "Bolder",  
8       "text": "${title}"  
9     },  
10    {  
11      "type": "ColumnSet",  
12      "columns": [  
13        {  
14          "type": "Column",  
15          "items": [  
16            {  
17              "type": "Image",
```

SAMPLE DATA EDITOR

```
1 {  
2   "title": "Publish Adaptive Card Schema",  
3   "description": "Now that we have defined the main rules  
4   "creator": {  
5     "name": "Matt Hiding",  
6     "profileImage": "https://pbs.twimg.com/profile_image  
7   },  
8   "createdUtc": "2017-02-14T06:08:39Z",  
9   "viewUrl": "https://adaptivecards.io",  
10  "properties": [  
11    {  
12      "key": "Board",  
13      "value": "Adaptive Cards"  
14    },  
15    {  
16      "key": "List",  
17      "value": "Backlog"
```

SAMPLE DATA

```
1 {  
2   "widgetSize": "medium",  
3   "hostTheme": "light"  
4 }
```

Writing Windows 11 Widgets



Adaptive Cards



Adaptive Cards are platform-agnostic UI snippets in JSON

Exchange at-a-glance content with interactive actions

Create templates with drag-and-drop designer

Preview Widgets Board sizes & theme

adaptivecards.io



Design Widgets with Adaptive Cards

Adaptive Cards Schema

Card Elements	Containers	Actions	Inputs	Types
TextBlock	ActionSet	OpenUrl	Text	BackgroundImage
Image	Container	Submit	Number	Refresh
Media	ColumnSet	ShowCard	Date	Authentication
MediaSource	Column	ToggleVisiblity	Time	TokenExchangeResource
CaptionSource	FactSet	TargetElement	Toggle	AuthCardButton
RichTextBlock	Fact	Execute	ChoiceSet	MetaData
TextRun	ImageSet		Choice	
	Table		Data.Query	
	TableCell			

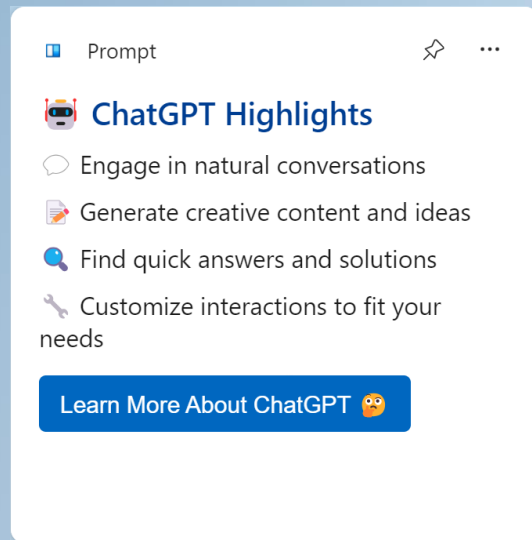


Adaptive Cards Widget Sizes



Design Widgets with Adaptive Cards

Adaptive Cards & ChatGPT



Adaptive Cards can be designed & output using ChatGPT's AI

ChatGPT can help you create content & implement ideas

Craft prompt to create your ideal Windows 11 Widget

Output your Adaptive Card quickly & easily

chatgpt.com



Design Widgets with Adaptive Cards

Version

Windows App SDK 1.6

Search

- > Microsoft.Windows.Storage
- > Microsoft.Windows.System
- > Microsoft.Windows.System.Power
- > Microsoft.Windows.Widgets
- > Microsoft.Windows.Widgets.Feeds.Providers
- > Microsoft.Windows.Widgets.Notifications
- > Microsoft.Windows.Widgets.Providers
- > Microsoft.Windows.Widgets.Providers
- > IWidgetManager
- > IWidgetProvider
- > IWidgetProvider2
- > IWidgetProviderAnalytics
- > IWidgetProviderErrors
- > WidgetActionInvokedArgs
- > WidgetAnalyticsInfoReportedArgs
- > WidgetContext
- > WidgetContextChangedEventArgs
- > WidgetCustomizationRequestedArgs
- > WidgetCustomizationRequestedArgs
- > WidgetErrorInfoReportedArgs
- > WidgetErrorInfoReportedArgs
- > WidgetInfo
- > WidgetInfo
- > WidgetManager
- > WidgetManager

Learn / Windows / Apps / API reference for Windows desktop apps / WinRT APIs /

Microsoft.Windows.Widgets.Providers Namespace

Reference

Provides APIs for implementing a widget provider for Windows Widgets.

Feedback

In this article

- Classes
- Interfaces
- Remarks

Develop Widgets with Windows App SDK

WidgetActionInvokedArgs	Provides data for the IWidgetProvider.OnActionInvoked(WidgetActionInvokedArgs) callback, which is raised when an action is invoked on a widget, such as the user clicking on a button.
WidgetAnalyticsInfoReportedArgs	Provides data for the OnAnalyticsInfoReported event which is raised when the widget host reports analytics data associated with a user interaction with a widget.
WidgetContext	Provides information about the configuration of a widget within the widget host.
WidgetContextChangedEventArgs	Provides data for the IWidgetProvider.OnWidgetContextChanged(WidgetContextChangedEventArgs) callback.
WidgetCustomizationRequestedArgs	Provides data for the OnCustomizationRequested event which is raised when the user has requested widget customization through the widget host UI.
WidgetErrorInfoReportedArgs	Provides data for the OnErrorInfoReported event which is raised when the widget host reports a widget error.
WidgetInfo	Contains status information for a widget, including the visual template, data template, custom state, the last update time, and context information from the widget host.
WidgetManager	Provides methods for querying, updating, and deleting widgets.

Counts

You have clicked the button 0 times

Rendering Only if Medium

Increment

Writing Windows 11 Widgets

Windows App SDK



Windows App SDK to build native Windows 10RS5 – 11 apps

Delivered from NuGet & updated every six months

Supports modern WinRT & native Windows APIs

Windows application development workload

aka.ms/winappsdk



Develop Widgets with Windows App SDK

Windows App SDK & .NET



.NET is a free & modern open-source developer framework

.NET & C# evolves to meet the needs of developers

Leverage latest .NET & C# in Windows App SDK

Create cross-platform .NET & C# applications

dot.net



Develop Widgets with Windows App SDK

Windows App SDK Widget Provider

IWidgetProvider

CreateWidget(WidgetContext)

DeleteWidget(widgetId, customState)

OnActionInvoked(WidgetActionInvokedArgs)

OnWidgetContextChanged(WidgetContextChangedArgs)

Activate(WidgetContext)

Deactivate(widgetId)

IWidgetProvider2

OnCustomizationRequested(WidgetCustomizationRequestedArgs)



Develop Widgets with Windows App SDK

Windows App SDK Package Manifest

uap3:AppExtension
Name
DisplayName
Id
PublicFolder
Uap3:Properties

uap3:Properties
WidgetProvider

WidgetProvider
ProviderIcons
Activation
Definitions

ProviderIcons
Icon

Activation
CreateInstance

CreateInstance
ClassId

Definition
Id
DisplayName
Description
AllowMultiple
IsCustomizable
Capabilities
ThemeResources

Capability
Size
Size
Name

ThemeResources
Icons
Screenshots
DarkMode
LightMode

Icon
Path

Screenshot
Path



RELEASED

Comentsys.Toolkit.WindowsAppSdk

- Controls, Converters, Extensions & Widget functionality for Windows App SDK
- Wraps Classes & Methods developed by Microsoft for Windows 11 Widgets
- Inherit WidgetProviderBase from a lightweight Class for Widget Provider
- Inherit WidgetBase to implement Widget methods & functionality
- NuGet Package, open-source & Widget example on GitHub

comentsys.com/packages/toolkits

Develop Widgets with Windows App SDK



WidgetProviderBase & WidgetBase

WidgetProviderBase
CreateWidget(WidgetContext)
DeleteWidget(widgetId, customState)
OnActionInvoked(WidgetActionInvokedArgs)
OnWidgetContextChanged(WidgetContextChangedEventArgs)
OnCustomizationRequested(WidgetCustomizationRequestedArgs)
Activate(WidgetContext)
Deactivate(widgetId)
UpdateWidget(widgetId, customState)
AddWidget(widgetName, widgetCreateDelegate)

WidgetBase
SetState(state)
CreateWidget(state)
Activate()
Deactivate()
DeleteWidget(state)
OnActionInvoked(WidgetActionInvokedArgs)
OnWidgetContextChanged(WidgetContextChangedEventArgs)
OnCustomizationRequested(WidgetCustomizationRequestedArgs)
GetTemplateForWidget()
GetDataForWidget()



Develop Widgets with Windows App SDK

When Widgets go Wrong



Uninstall your Application using Add or Remove Programs

Deploy your Application again from Visual Studio 2022

Commands if Widget is Blank in Widgets Board

```
winget uninstall --id 9MSSGKG348SP
```

```
winget install --id 9MSSGKG348SP
```



Demo

Design & Develop Widgets



Writing Windows 11 Widgets

Overview



Windows 11 features at-a-glance Widgets to stay in your flow

Design your Windows 11 Widgets using Adaptive Cards

Quickly & easily create Adaptive Cards with ChatGPT

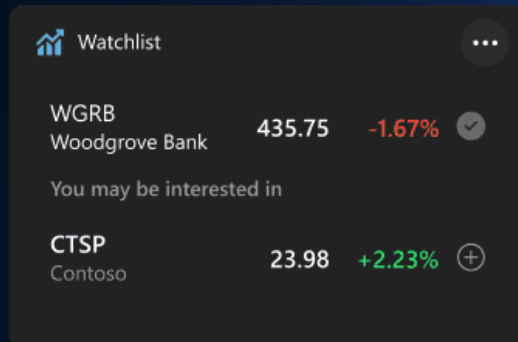
Develop your Widgets with Windows App SDK

Use Comentsys.Toolkit.WindowsAppSdk



Writing Windows 11 Widgets

Any Questions?



dot.net

chatgpt.com

windows.com

adaptivecards.io

aka.ms/winappsdk

aka.ms/widgetdevdocs

comentsys.com/packages/toolkits

github.com/rogueplanetoid/writingwindows11widgets

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