

I'll Get Back to You Task, Await, and Async Methods in C#

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Level: Introductory to Intermediate





Asynchronous Patterns

- Asynchronous Programming Model (APM)
- Event Asynchronous Pattern (EAP)
- Task Asynchronous Pattern (TAP)

Asynchronous Programming Model (APM)

- Method-Based
- Methods
 - BeginGetData()
 - EndGetData()
- IAsyncResult

Event Asynchronous Pattern (EAP)

- Method/Event-Based
- Method
 - GetDataAsync()
- Event
 - GetDataCompleted
 - Results in EventArgs

Task Asynchronous Pattern (TAP)

- Task-Based
- Method Returns a Task
 - `Task<T> GetDataAsync()`
- Task
 - Represents a concurrent operation
 - May or may not operate on a separate thread
 - Can be chained and combined

async & await

- Syntactic Wrapper Around Task
 - “await” pauses the current method until Task is complete.
 - Looks like a blocking operation
 - Does not block current thread
- “async” is just a Hint
 - Does not make a method run asynchronously
 - Tells the compiler to treat “await” as noted above

Task Properties

- Task Properties
 - IsCanceled
 - IsCompleted*
 - IsFaulted

**Note: Means “no longer running” not “completed successfully”*

IsCompletedSuccessfully

- .NET Core
- .NET Standard 2.1
- .NET 6

- NOT .NET Standard 2.0
- NOT .NET Framework

Task Properties

- Task Properties
 - IsCanceled
 - IsCompleted*
 - IsFaulted
 - Status

**Note: Means “no longer running” not “completed successfully”*

- TaskStatus
 - **Canceled**
 - Created
 - **Faulted**
 - **RanToCompletion**
 - Running
 - WaitingForActivation
 - WaitingForChildrenToComplete
 - WaitingToRun

Exception Handling

- AggregateException
 - Tree structure
- Flatten()
 - Flattens the tree structure to a single level

Cancellation

- CancellationToken is ReadOnly
 - new CancellationToken(true)
 - new CancellationToken(false)
- CancellationTokenSource
 - var cts = new CancellationTokenSource()
 - var token = cts.Token
 - cts.Cancel()



Resources

Code Samples & Resources

[https://github.com/jeremybytes/
vslive2022-austin](https://github.com/jeremybytes/vslive2022-austin)



Thank You!

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