



# I'll Get Back to You

## Task, Await, and Asynchronous Programming

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# 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

## IsCompletedSuccessfully

- .NET Core
- .NET Standard 2.1
- NOT .NET Standard 2.0
- NOT .NET Framework

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

# 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()



Thank You!

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