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I’ll Get Back to You

Task, Await and Asynchronous Programming

Jeremy Clark
Developer Betterer
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Level: Introductory / Intermediate

Next Generation Skills
for Developers

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#VSLIVE

Async Revolves Around Task

Use Task directly

- Extremely powerful
- Lots of options
- Very complex

await Task

- Looks like other code
- Limited functionality
- Fits the “95% scenario”

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Task<T>

- Method Returns a Task
  - Task<T> GetDataAsync()
  - “T” = type for the result
- 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” modifier
  - Tells the compiler to treat “await” as noted above
  - The compiled method is turned into a state machine

Task Properties (.NET 8 / 9)

- Task Properties
  - IsFaulted
  - IsCanceled
  - IsCompleted*
  - IsCompletedSuccessfully

**Note: Means "no longer running" not "completed successfully"*

IsCompletedSuccessfully

- .NET 8 / 9
- .NET Standard 2.1

- NOT .NET Framework
- NOT .NET Standard 2.0

Task Properties (.NET Framework)

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

**Note: Means "no longer running" not "completed successfully"*

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

Exception Handling

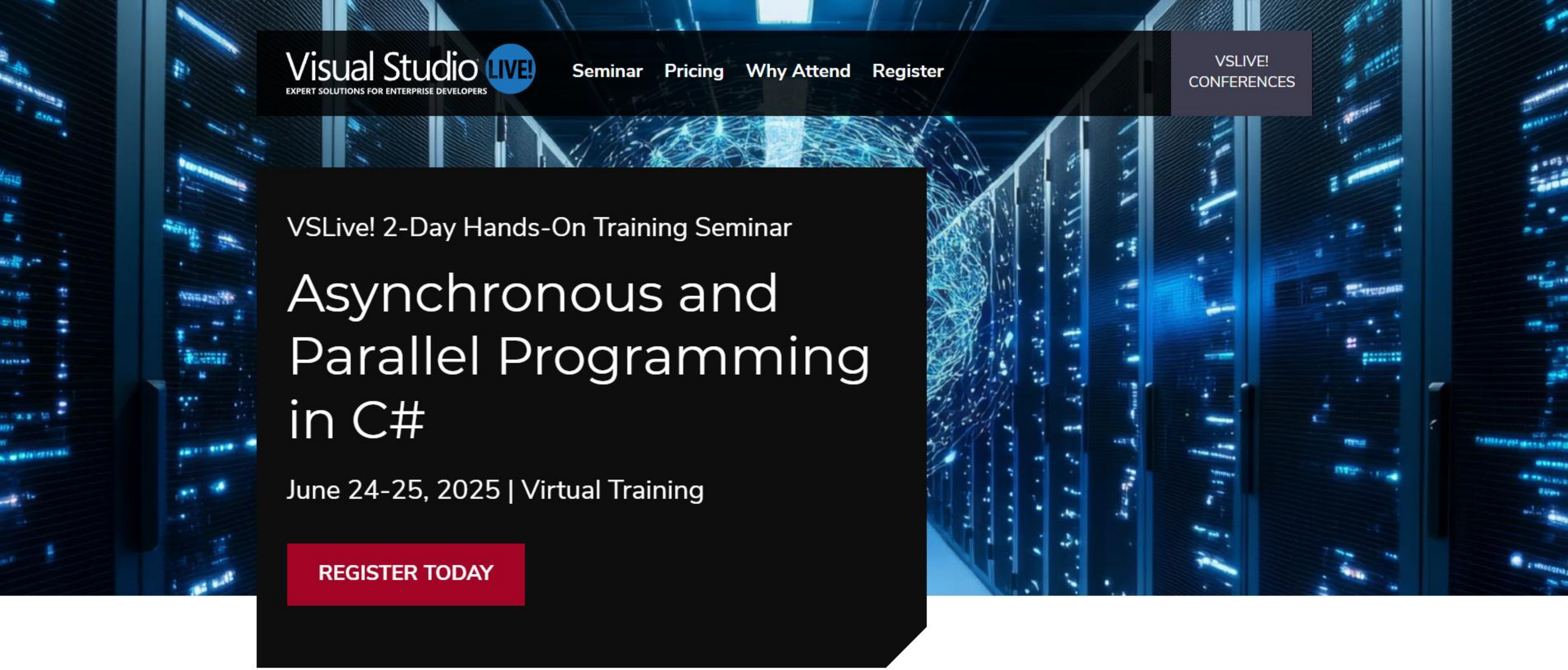
- AggregateException
  - Tree structure

- 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()



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Thank You!

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https://github.com/jeremybytes/vslive2025-lasvegas