# Supporting Multiple .NET Versions in a Class Library Project

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# Overview

An overview of multi-targeting

Conditional compilation preprocessor directives

Add multi-targeting to a class library project

Conditional property groups

The effect of multi-targeting on project properties

Add conditional code for different targets

Create console apps for different targets

Preventing bugs if new targets are added

Dealing with unsupported operations for some targets

# An Overview of Multi-targeting

**Output multiple DLL files from a single project**

**Each DLL supports ("targets") a different .NET version**

**Makes class library more widely consumable**

**Compile different C# code for different targets (.dll)**

**Support different targets for different apps inside your organization**

**Support different targets for open source libraries on NuGet.org**

**Access version/target-specific APIs**

# Target Framework Moniker (TFM)

**A standardized "code" that represents a target framework.**

# TFM Examples

| Framework & version | TFM |
| --- | --- |
| .NET Framework 4.8 | net48 |
| .NET Core 3.1 | netcoreapp3.1 |
| .NET Standard 2.1 | netstandard2.1 |
| .NET 5 | net5.0 |
| .NET 6 | net6.0 |

# OS-specific TFMs

**Allow APIs from a specified operating system to be available**

**Introduced from .NET 5 and onwards**

**Examples:**
- net6.0-windows
- net6.0-ios
- net6.0-ios15.1

# Conditional Compilation Preprocessor Directives

Allow you to include or exclude source code from the compilation process based on whether or not specific preprocessor symbols have been defined.

Preprocessor Symbol: a named text "flag" that can either exist ("defined") or not exist ("undefined"), i.e. a Boolean value.

# Conditional Compilation Preprocessor Directives

| #if | #elif | #else | #endif |
|---|---|---|---|
| **Starts a conditional compilation block** | **"else if" Alternate conditional block** | **Alternate block if other blocks not matched** | **Ends a conditional compilation block** |

# Conditional Compilation Preprocessor Directives

```
#if DEBUG
        Console.WriteLine("DEBUG is defined");
#else
        Console.WriteLine("DEBUG is not defined");
#endif

// The DEBUG preprocessor symbol is automatically defined during debug builds
```

# #error

Generates a compiler error
with a custom message.

# Auto-defined Symbols for TFMs

net48                    netstandard2.1                    net6.0

**NET48**              **NETSTANDARD2_1**              **NET6_0**
**NETFRAMEWORK**        **NETSTANDARD**                **NET**

# Additional Symbols (.NET 5+)

**NET48_OR_GREATER, NET472_OR_GREATER, NET471_OR_GREATER, NET47_OR_GREATER, NET462_OR_GREATER, NET461_OR_GREATER, NET46_OR_GREATER, NET452_OR_GREATER, NET451_OR_GREATER, NET45_OR_GREATER, NET40_OR_GREATER, NET35_OR_GREATER, NET20_OR_GREATER**

# Additional Symbols (.NET 5+)

NETSTANDARD2_1_OR_GREATER,
NETSTANDARD2_0_OR_GREATER,
NETSTANDARD1_6_OR_GREATER,
NETSTANDARD1_5_OR_GREATER,
NETSTANDARD1_4_OR_GREATER,
NETSTANDARD1_3_OR_GREATER,
NETSTANDARD1_2_OR_GREATER,
NETSTANDARD1_1_OR_GREATER,
NETSTANDARD1_0_OR_GREATER

# Additional Symbols (.NET 5+)

NET6_0_OR_GREATER,
NET5_0_OR_GREATER,
NETCOREAPP3_1_OR_GREATER,
NETCOREAPP3_0_OR_GREATER,
NETCOREAPP2_2_OR_GREATER,
NETCOREAPP2_1_OR_GREATER,
NETCOREAPP2_0_OR_GREATER,
NETCOREAPP1_1_OR_GREATER,
NETCOREAPP1_0_OR_GREATER

# TFM / Symbol Documentation

**https://docs.microsoft.com/en-us/dotnet/standard/frameworks**

**https://bit.ly/tfmdocs**

# Summary

An overview of multi-targeting and TFMs

#if #elif #else #endif

<TargetFrameworks>...</TargetFrameworks>

<PropertyGroup Condition="...">

Multi-targeting in project properties

#if NET6_0

Created console apps for different targets

Dealing with unsupported operations
- #error
- PlatformNotSupportedException
- IsWriteAsHexSupported

# Up Next:
# Unit Testing Class Library Projects