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Blazor WebAssembly

Perfect for SPA and much more

Thanh Le

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Agenda

1. What is WebAssembly?
2. Blazor Overview
3. Blazor WebAssembly vs Blazor Server
4. PROS & CONS of Blazor hosting models
5. Demo

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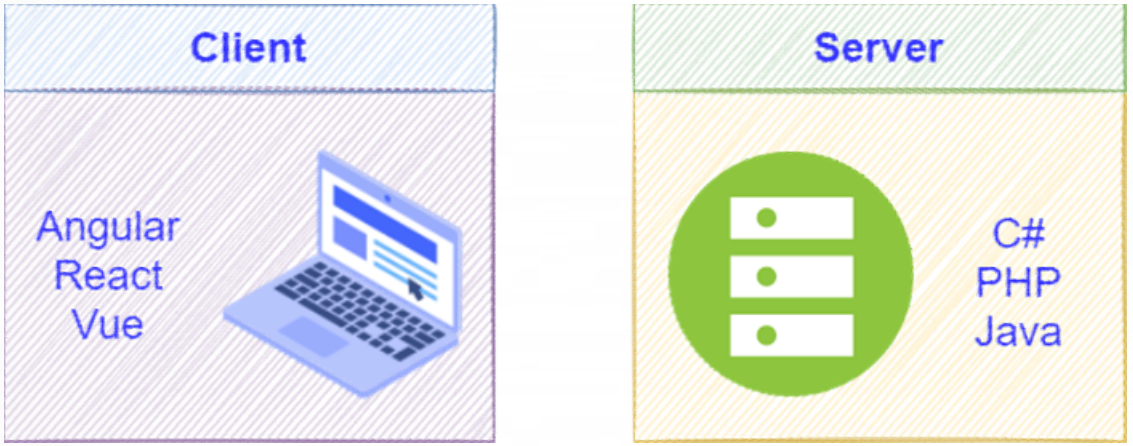
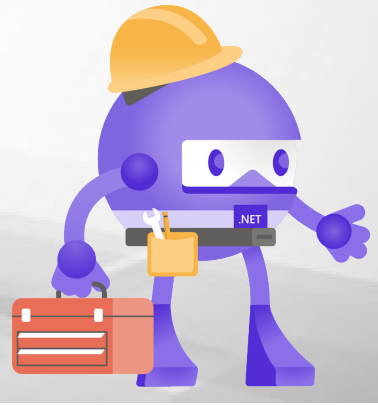
Modern Web Development





What is WebAssembly?

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Web Assembly

"WebAssembly (abbreviated Wasm) is a binary instruction format for a stack-based virtual machine. Wasm is designed as a portable target for compilation of high-level languages like C/C++/Rust, enabling deployment on the web for client and server applications."

Source: https://webassembly.org/

WA

- **Recommended by W3C (5th Dec 2019)**
- **Can written by C/C++, C#, Python, Rust...**
- **Efficient and Fast**
- **Safe**

WASM format

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TEXTUAL (.WAT)

```
(module
 (table 0 anyfunc)
 (memory $0 1)
 (export "memory" (memory $0))
 (export "_Z3Sumii" (func $_Z3Sumii))
 (func $_Z3Sumii (; 0 ;) (param $0 i32) (param $1 i32) (result
   i32)
  (i32.add
   (get_local $1)
   (get_local $0)
  )
 )
)
```

BINARY (.WASM)

```
wasm-function[0]:
  sub rsp, 8                    ; 0x000000 48 83 ec 08
  mov ecx, esi                  ; 0x000004 8b ce
  mov eax, ecx                  ; 0x000006 8b c1
  add eax, edi                  ; 0x000008 03 c7
  nop                           ; 0x00000a 66 90
  add rsp, 8                    ; 0x00000c 48 83 c4 08
  ret                           ; 0x000010 c3
```

How it works?

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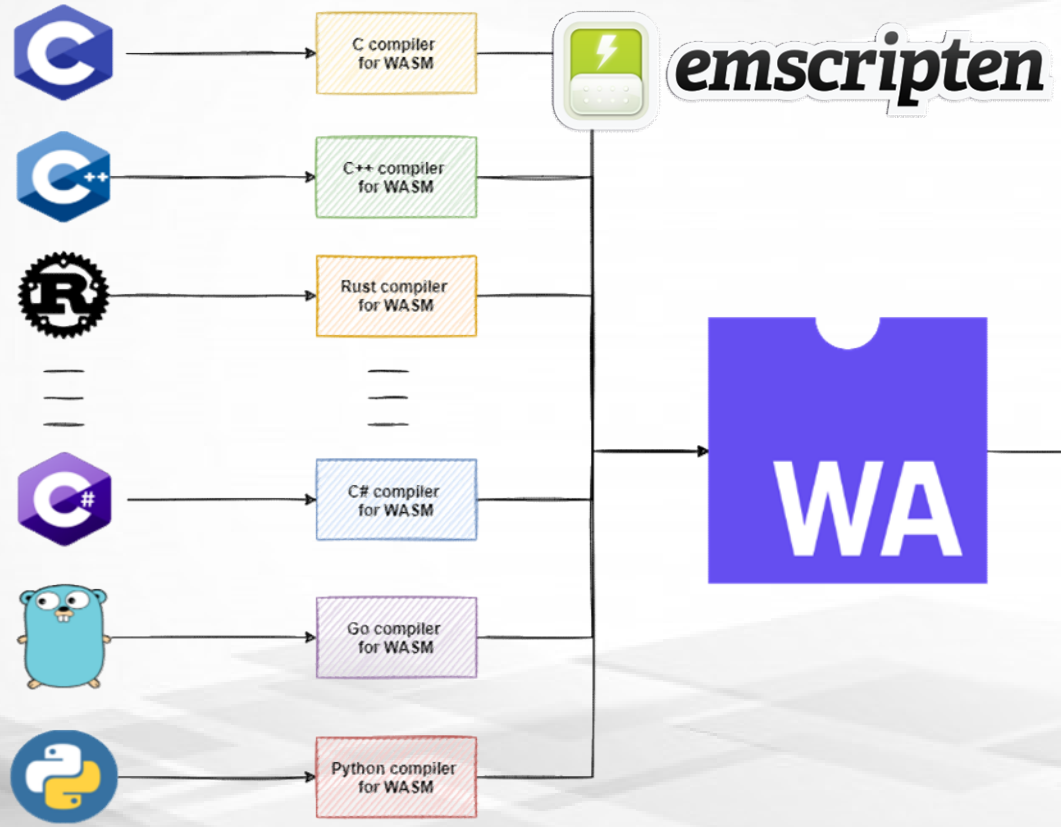
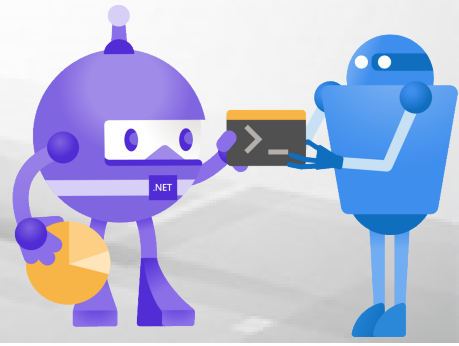
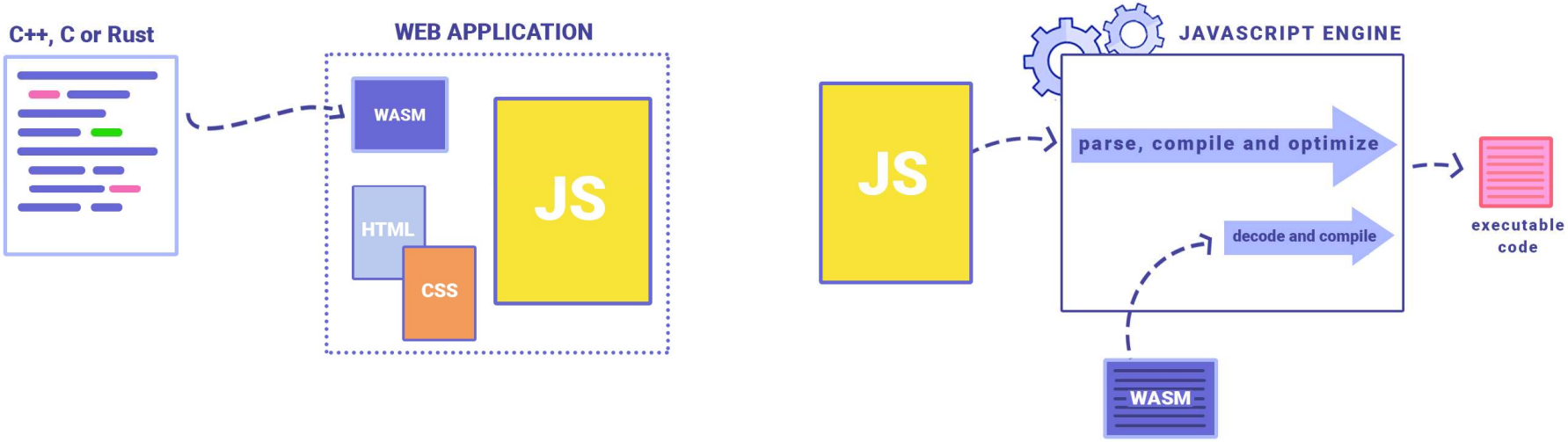




Why WebAssembly?



- It's not a replacement for JavaScript, it works alongside JavaScript.
- Better performance than JavaScript

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Blazor Overview

Blazor

Blazor is a client-side library that uses .NET on Web Assembly to support Single Page Applications written in C# using Razor templates.

- Combination of .NET Code and Razor syntax
- Free and Open Source
- Not like Silverlight
- Can run without plugins
- Share class libraries between client and server

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Web Development

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in the Browser

History

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- 2006 – Silverlight
- 2011 – Silverlight 5 (RIP)
- 2017 – Web Assembly
- 2017 - Blazor was announced (Steve Sanderson)
- 2019 - Blazor Preview (Daniel Roth)
- 2019 – Blazor Server - .NET Core 3.0 (Sept)
- 2019 – Blazor WebAssembly - .NET Core 3.1 (Dec)
- 2021 – Blazor LTS - .NET 6 (Nov)

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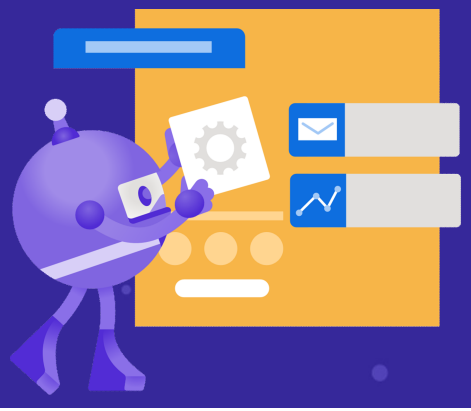
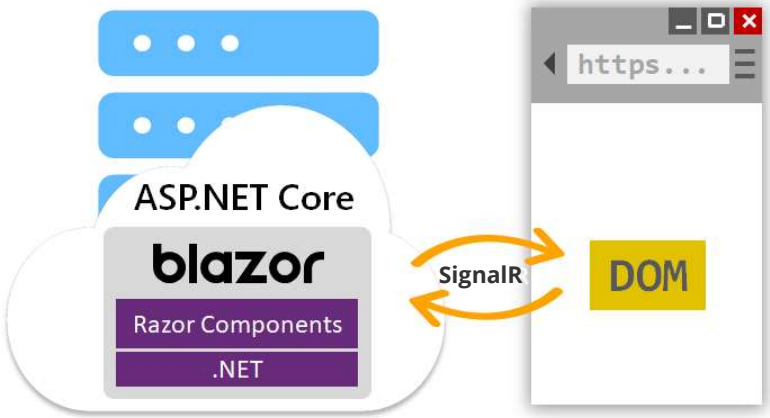
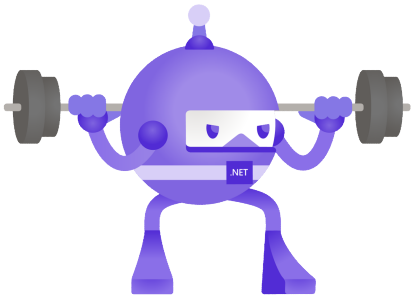
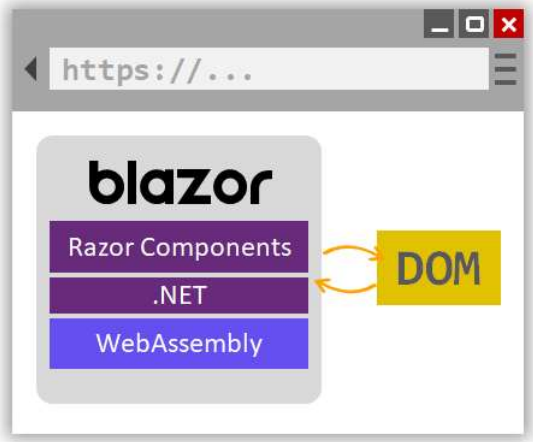
Blazor Server & Blazor WebAssembly



Blazor Hosting Models







Blazor Server

- Server-side logic and rendering
- DOM updates via SignalR

Blazor WebAssembly

- Client-side logic
- Incremental DOM

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Blazor Server

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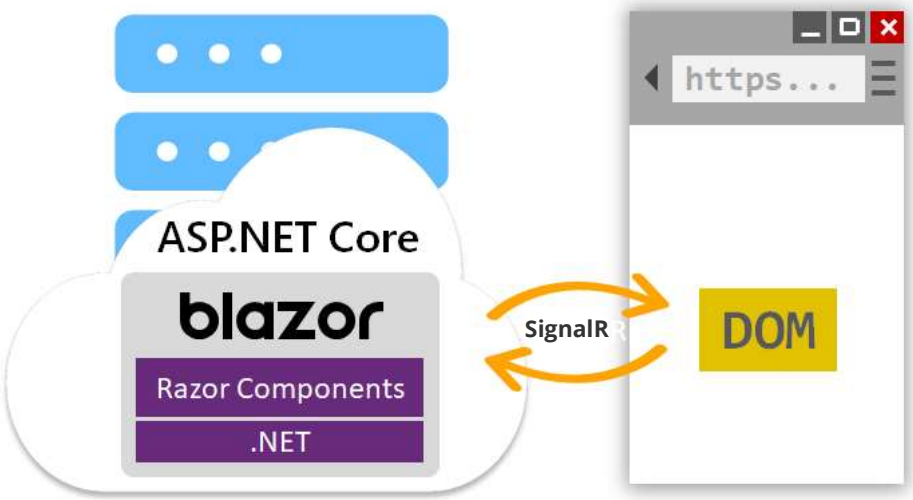
❖ PROS

- ✓ No initial download size
- ✓ Server-side rendering
- ✓ Faster in the first load time
- ✓ Work on older browsers
- ✓ API/Server code is private

❑ CONS

- ➢ Latency – SignalR on each event
- ➢ Maintain client connections
- ➢ No offline support
- ➢ Maintain client state
- ➢ High memory usage



Blazor WebAssembly

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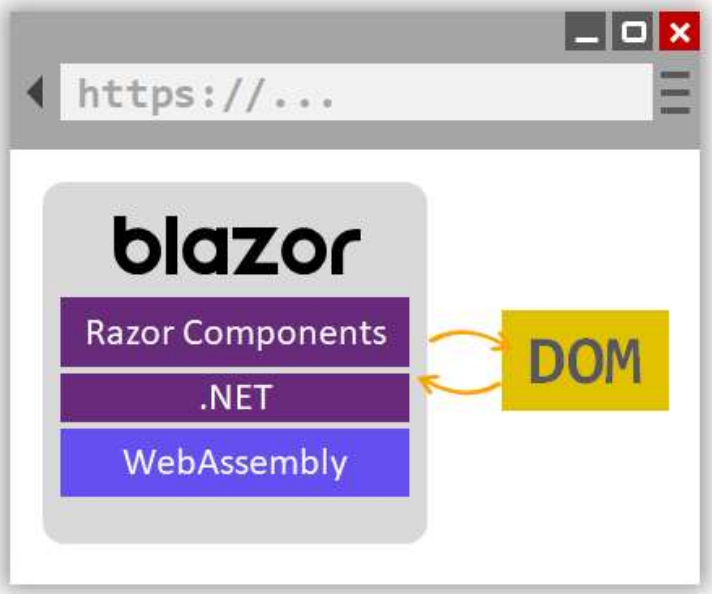
❖ **PROS**

- ✓ .NET Code in the browser
- ✓ “Near” native speed
- ✓ Shared code
- ✓ No server-side dependency
- ✓ Progressive Web App (PWA)

❑ **CONS**

- ➢ Initial download size (~700kb)
- ➢ Need a modern browser
- ➢ Tooling still need to mature



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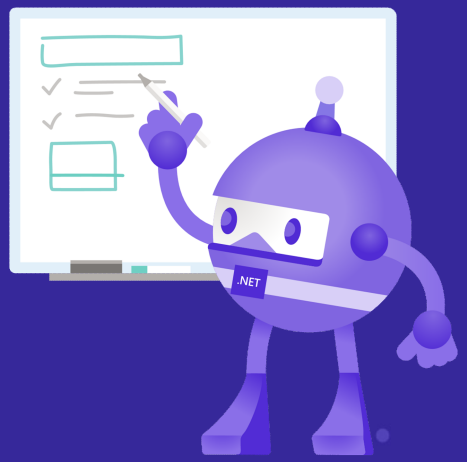
Demo



Component Anatomy

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Directives

```
@page "/"
@using BlazorSignalRApp.Shared;
@inject HttpClient Http
```

Markup & Razor

```
<h1>@PageTitle</h1>

@if (forecasts == null)
{
    <p><em>Loading...</em></p>
} ...
```

Code/Logic

```
@code {
    private string PageTitle = "Blazor Weather App";
    WeatherForecast[] forecasts;

    protected override async Task OnInitializedAsync()
    {
        forecasts = await Http.GetFromJsonAsync<WeatherForecast[]>("WeatherForecast");
    }
}
```

References

- Awesome WebAssembly List: https://github.com/mbasso/awesome-wasm
- Awesome Blazor List: https://github.com/AdrienTorris/awesome-blazor

Thanks for joining!

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