.NET Plattform
Rückblick – Pre .NET 5

.NET Framework	Xamarin	.NET Core
Base Class Library	Mono BCL	Core BCL

.NET Standard

Snapbean
Software GmbH
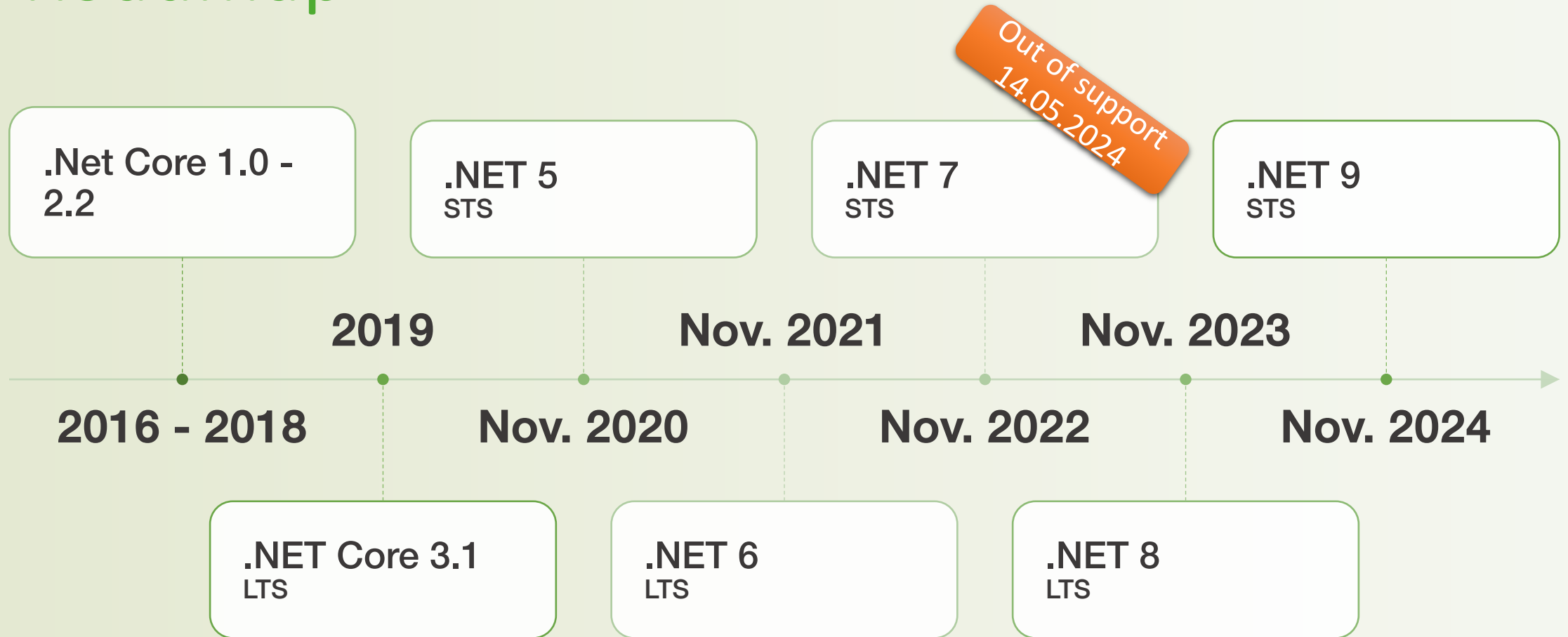
.NET Plattform
Rückblick – one .NET to rule them all

.NET Plattform
Roadmap

Long Term Support = 3 Jahre
Short Term Support = 18 Monate

Out of support
14.05.2024

| .Net Core 1.0 - 2.2 | | .NET 5 STS | | .NET 7 STS | | .NET 9 STS |

2019

Nov. 2021

Nov. 2023

2016 - 2018

Nov. 2020

Nov. 2022

Nov. 2024

| .NET Core 3.1 LTS | | .NET 6 LTS | | .NET 8 LTS |

Snapbean
Software GmbH

.NET 7
Rückblick - Features

- **Performance**
  1000 PRs mit Performance Verbesserungen

- **C# 11**
  Raw string literals, required properties, list patterns

- **ASP.NET Core**
  Rate-Limiting Middleware, Minimal API Verbesserungen

Snapbean
Software GmbH

.NET 8
Features

- ## C#12
  Primary Constructors, Collection Expressions, …

- ## ASP.NET Core
  Keyed Services, Short circuit, BackgroundServices, …

- ## .NET Aspire
  Cloud-ready Stack für verteilte Applikationen

Snapbean
Software GmbH

.NET 8
Upgrade

```
--- a/Upgrade.csproj
+++ b/Upgrade.csproj
@@ -2,13 +2,13 @@

  <PropertyGroup>
    <OutputType>Exe</OutputType>
-    <TargetFramework>net7.0</TargetFramework>
+    <TargetFramework>net8.0</TargetFramework>^M
    <ImplicitUsings>enable</ImplicitUsings>
    <Nullable>enable</Nullable>
  </PropertyGroup>

  <ItemGroup>
-    <PackageReference Include="Microsoft.EntityFrameworkCore" Version="7.0.8" />
+    <PackageReference Include="Microsoft.EntityFrameworkCore" Version="8.0.4" />^M
  </ItemGroup>

 </Project>
(END)
```

Snapbean
Software GmbH

.NET 8
Tooling

- ## Visual Studio 2022 17.8+
  ### Http Files Support

  ### GitHub Copilot

Snapbean
Software GmbH

.NET 8
Tooling

- ## CLI
  ### Modernisierter Build Output

```
dotnet build
MSBuild version 17.8.3+195e7f5a3 for .NET
  Determining projects to restore...
  All projects are up-to-date for restore.
  02_RequiredProperties -> /Users/manuel/git/developer-day-2024/csharp/csharp11/02_RequiredPropert
ies/bin/Debug/net7.0/02_RequiredProperties.dll
  01_RawStringLiterals -> /Users/manuel/git/developer-day-2024/csharp/csharp11/01_RawStringLiteral
s/bin/Debug/net7.0/01_RawStringLiterals.dll
/Users/manuel/git/developer-day-2024/csharp/csharp11/03_ListPatterns/Program.cs(24,19): error CS01
03: The name 'resadfsult' does not exist in the current context [/Users/manuel/git/developer-day-2
024/csharp/csharp11/03_ListPatterns/03_ListPatterns.csproj]

Build FAILED.

/Users/manuel/git/developer-day-2024/csharp/csharp11/03_ListPatterns/Program.cs(24,19): error CS01
03: The name 'resadfsult' does not exist in the current context [/Users/manuel/git/developer-day-2
024/csharp/csharp11/03_ListPatterns/03_ListPatterns.csproj]
    0 Warning(s)
    1 Error(s)

Time Elapsed 00:00:00.78
```

```
dotnet build --tl
MSBuild version 17.8.3+195e7f5a3 for .NET
Restore complete (0.3s)
  02_RequiredProperties succeeded (0.1s) → 02_RequiredProperties/bin/Debug/net7.0/02_RequiredPrope
rties.dll
  01_RawStringLiterals succeeded (0.1s) → 01_RawStringLiterals/bin/Debug/net7.0/01_RawStringLitera
ls.dll
  03_ListPatterns failed with errors (0.6s)
    /Users/manuel/git/developer-day-2024/csharp/csharp11/03_ListPatterns/Program.cs(24,19): error
CS0103: The name 'resadfsult' does not exist in the current context

Build failed with errors in 1.0s
```

Snapbean
Software GmbH

.NET 8
Tooling

- ## CLI
  ### MSBuild Daten für Build Scripts nutzen

```
dotnet publish --getProperty:OutputType
Exe
```

```xml
<Project Sdk="Microsoft.NET.Sdk">
  <PropertyGroup>
    <OutputType>Exe</OutputType>
    <TargetFramework>net8.0</TargetFramework>
    <LangVersion>12.0</LangVersion>
    <ImplicitUsings>true</ImplicitUsings>
  </PropertyGroup>
</Project>
```
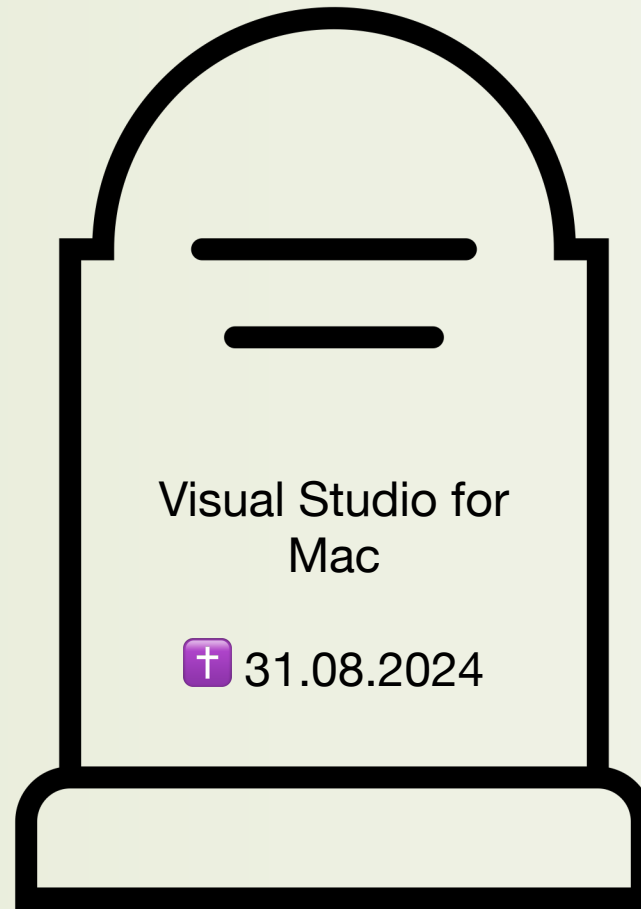
Snapbean
Software GmbH

.NET 8
Tooling

Visual Studio for Mac

✝ 31.08.2024

Retirement Announcement

Snapbean
Software GmbH

.NET 8
Tooling

Demo Time !

Snapbean
Software GmbH

C#
10

- Global usings

- Implicit usings

- Extended property patterns

```
var isFromStevenKing = book is { Author.Name: "Steven King" };

string bookDescription = book switch
{
    { ISBN: "1234" } or { ISBN: "4321" } => "Book has ISBN 1234 oder 4321",
    { Author.Name: "Steven King" } => "Book is from Steven King",
    _ => "No idea"
};
```

Snapbean
Software GmbH

C#
11

- Raw string literals

- Required properties

- Extended list patterns

```csharp
const string json = $$"""
    [
        {
            "firstName": "{{firstName}}",
            "lastName": "{{lastName}}"
        }
    ]
    """;

public class Person
{
    public required string FirstName { get; set; }
    public required string LastName { get; set; }
    public int Age { get; set; }
}

var numbers = new int[] { 1, 2, 4, 8, 16 };
numbers is [1, 2, 4, 8, 16]; // true
numbers is [_, _, _, 8]; // false
numbers is [1, ..]; // true
numbers is [1, var a, ..]; // true
```

Snapbean
Software GmbH

C#
12

- Primary Constructors

- Collection Expressions

- Default lambda parameters

- Alias any type

- (Erweiterte Data Annotations)

[Language Feature Status](#)

Snapbean
Software GmbH

C#

Demo Time !

Snapbean
Software GmbH

C#

- Neue C# Features in "alten" .NET Applikationen nutzen

- Erstellt PollyFills über Source Generators

- Einschränkungen: von Runtime abhängige Features

https://github.com/Sergio0694/PolySharp

Snapbean
Software GmbH

C#

Demo Time !

Snapbean
Software GmbH

ASP.NET Core 8
Architektur Übersicht

ASP.NET Core Applications

- ASP.NET Core MVC
- ASP.NET Core API Minimal API
- ASP.NET Core Razor Pages
- ASP.NET Core Blazor

Miscellaneous

- SignalR
- gRPC

ASP.NET Core Platform

- Model binding
- Middleware
- Dependency Injection
- Logging
- Razor
- Kestrel

Snapbean
Software GmbH

ASP.NET Core 8
Keyed Service Registration

- **Neues Dependency Injection feature**
  - **Erweiterung des Service Descriptors mit einem Key**

```csharp
// Regular registration
builder.Services.AddSingleton<ILoggingService, FileLogService>();
builder.Services.AddSingleton<ILoggingService, DatabaseLogService>();

// Keyed registration
builder.Services.AddKeyedSingleton<ILoggingService, FileLogService>("file");
builder.Services.AddKeyedSingleton<ILoggingService, DatabaseLogService>("db");
```

Snapbean
Software GmbH

ASP.NET Core 8
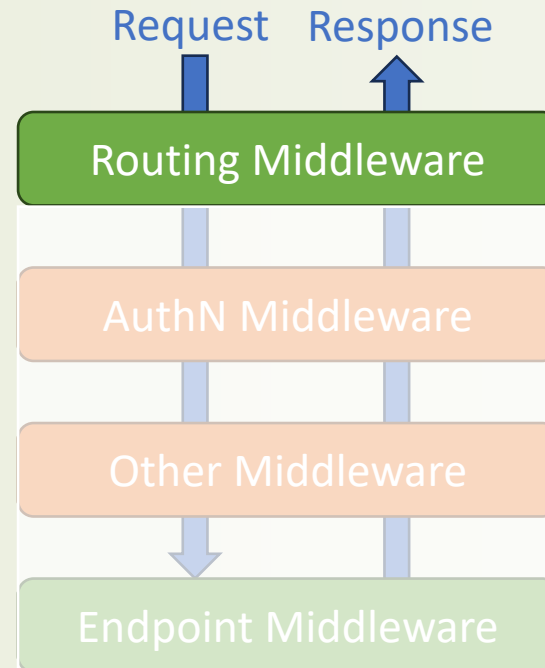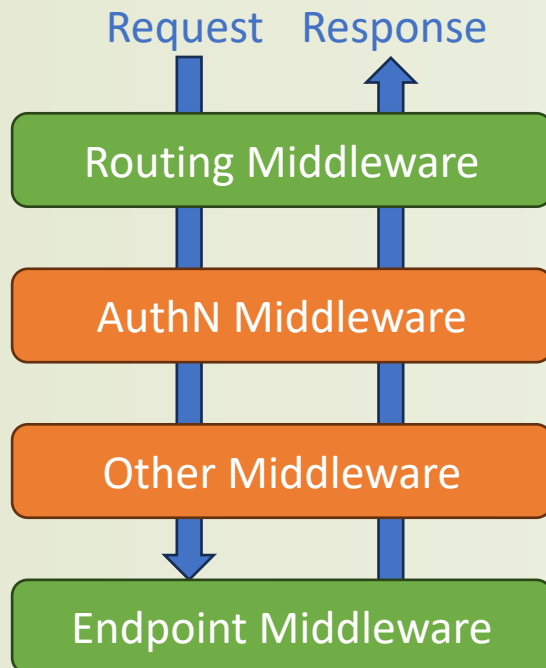## Keyed Service Registration

Demo Time!

Snapbean
Software GmbH

ASP.NET Core 8
Short-circuit routing

```
app.MapGet('/health', () => Results.Ok()).ShortCircuit()

app.MapShortCircuit(404, 'favicon.ico')
```

- Neue Funktion zum Überspringen von Middleware

Request Response

| Routing Middleware |
| AuthN Middleware |
| Other Middleware |
| Endpoint Middleware |

Request Response

| Routing Middleware |
| AuthN Middleware |
| Other Middleware |
| Endpoint Middleware |

Snapbean
Software GmbH

ASP.NET Core 8
Short-circuit routing

Demo Time !

Snapbean
Software GmbH

ASP.NET Core 8
Native AOT

- ### Aktueller Support für folgende Templates
  - #### gRPC Template
  - #### Minimal APIs

```
// Regular builder
var builder = WebApplication.CreateBuilder(args)

// AOT builder
var builder = WebApplication.CreateSlimBuilder(args)
```

ASP.NET Core support for Native AOT

Snapbean
Software GmbH

ASP.NET Core 8
Improved Background Service

- **Pre .NET 8**
  - IHostedService (Start-, StopAsync)
  - BackgroundService BaseClass

- **Ab .NET 8**
  - IHostedLifecycleService

```csharp
namespace Microsoft.Extensions.Hosting
{
    public interface IHostedLifecycleService : IHostedService
    {
        Task StartingAsync(CancellationToken cancellationToken);
        // Task StartAsync(CancellationToken cancellationToken);
        Task StartedAsync(CancellationToken cancellationToken);
        Task StoppingAsync(CancellationToken cancellationToken);
        // Task StopAsync(CancellationToken cancellationToken);
        Task StoppedAsync(CancellationToken cancellationToken);
    }
}
```

```csharp
// Configure to start concurrently
builder.Services.Configure<HostOptions>(hostOptions =>
{
    hostOptions.ServicesStartConcurrently = true;
    hostOptions.ServicesStopConcurrently = true;
});
```

```csharp
// Hosted service registration
builder.Services.AddHostedService<PreviousHostedService>();
builder.Services.AddHostedService<PreviousBackgroundService>();
builder.Services.AddHostedService<NewHostedLifecycleService>();
```
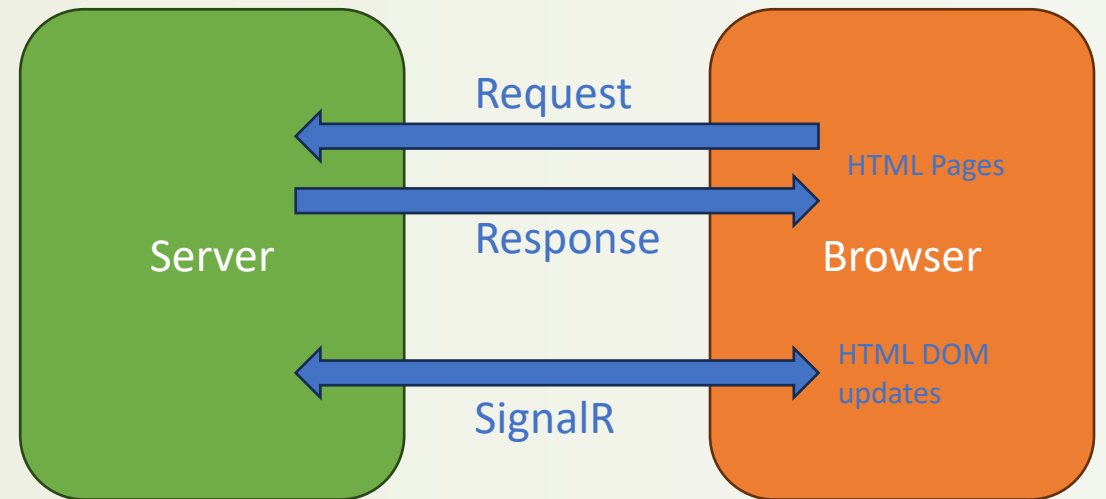
Snapbean
Software GmbH

ASP.NET Core 8
Improved Background Service

Demo Time!

Snapbean
Software GmbH

ASP.NET Core 8
Blazor

- Pre .NET 8
  - Blazor Server
  - Blazor WebAssembly (WASM)
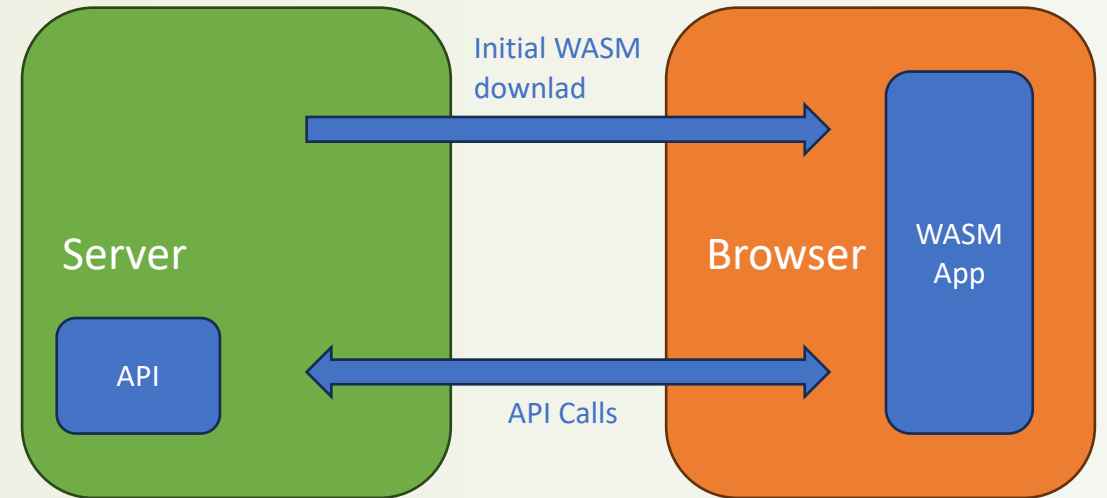
- Ab .NET 8
  - Blazor Full Stack Web UI

Snapbean
Software GmbH

ASP.NET Core 8
Blazor Server

- **Server-side rendering**
  - **Request / Response**
- **SignalR Verbindungen**
  - **WebSockets**

ASP.NET Core 8
Blazor WebAssembly

- ## Native (WASM) Code
  - ### Client-side rendered (SPA ähnlich)
- ## Backend via APIs

Server
- API

Browser
- WASM App

Initial WASM downlad

API Calls

Snapbean
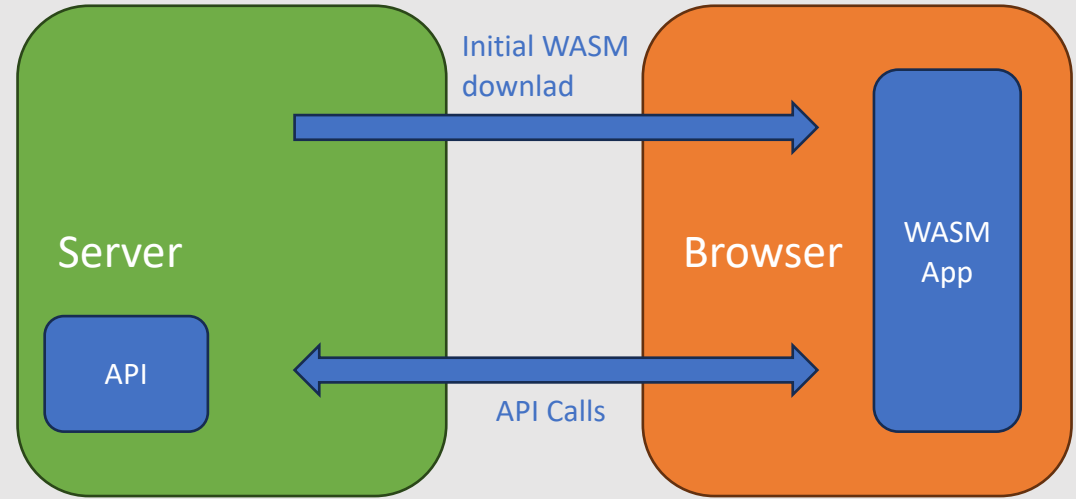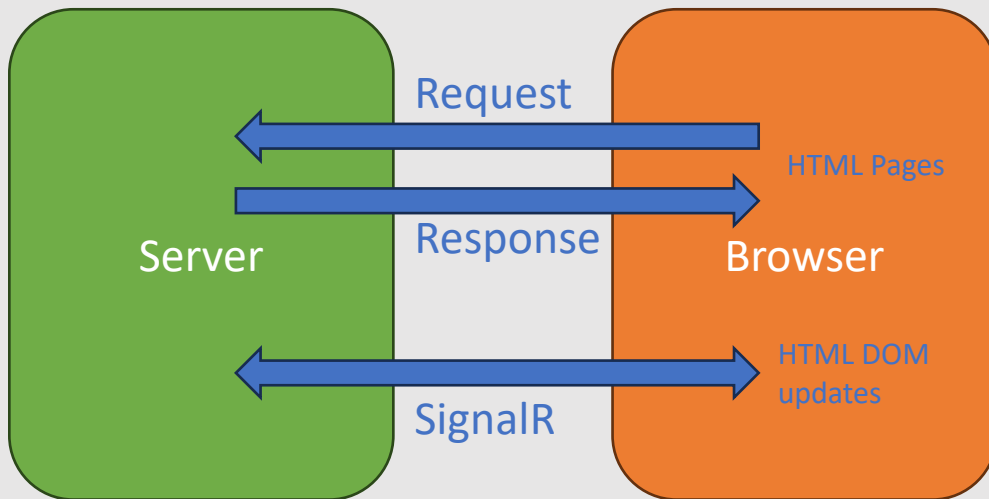Software GmbH

ASP.NET Core 8
Blazor Full Stack Web UI

- Neuer Typ - Server und WASM "kombiniert"
  - Projekt Template: Blazor Web App

- @renderMode
  - Interactive- None / Server / WebAssembly / Auto
  - Definierbar pro Seite, Komponente oder Applikation

Snapbean
Software GmbH

ASP.NET Core 8
Blazor Full Stack Web UI

Blazor Full Stack Web UI

Server → Request → Browser

Server → Response → Browser
HTML Pages

Server ← SignalR → Browser
HTML DOM updates

Server → Initial WASM downlad → Browser (WASM App)

Server (API) ← API Calls → Browser (WASM App)

Snapbean
Software GmbH

ASP.NET Core 8
Blazor Full Stack Web UI

Demo Time!

Snapbean
Software GmbH

ASP.NET Core 8
ASP.Net Core Identity

- ## Pre .NET 8
  - Default UI Seiten (Microsoft.AspNetCore.Identity.UI)

- ## Ab .NET 8
  - Default UI Seiten
  - Minimal API Endpunkte (Microsoft.AspNetCore.Identity…)

Snapbean
Software GmbH

ASP.NET Core 8
ASP.Net Core Identity

Demo Time!

Snapbean
Software GmbH

ASP.NET Core 8
Security Themen

- Update der "Crypto"-Libraries
- Default support: HTTP/3
- ...
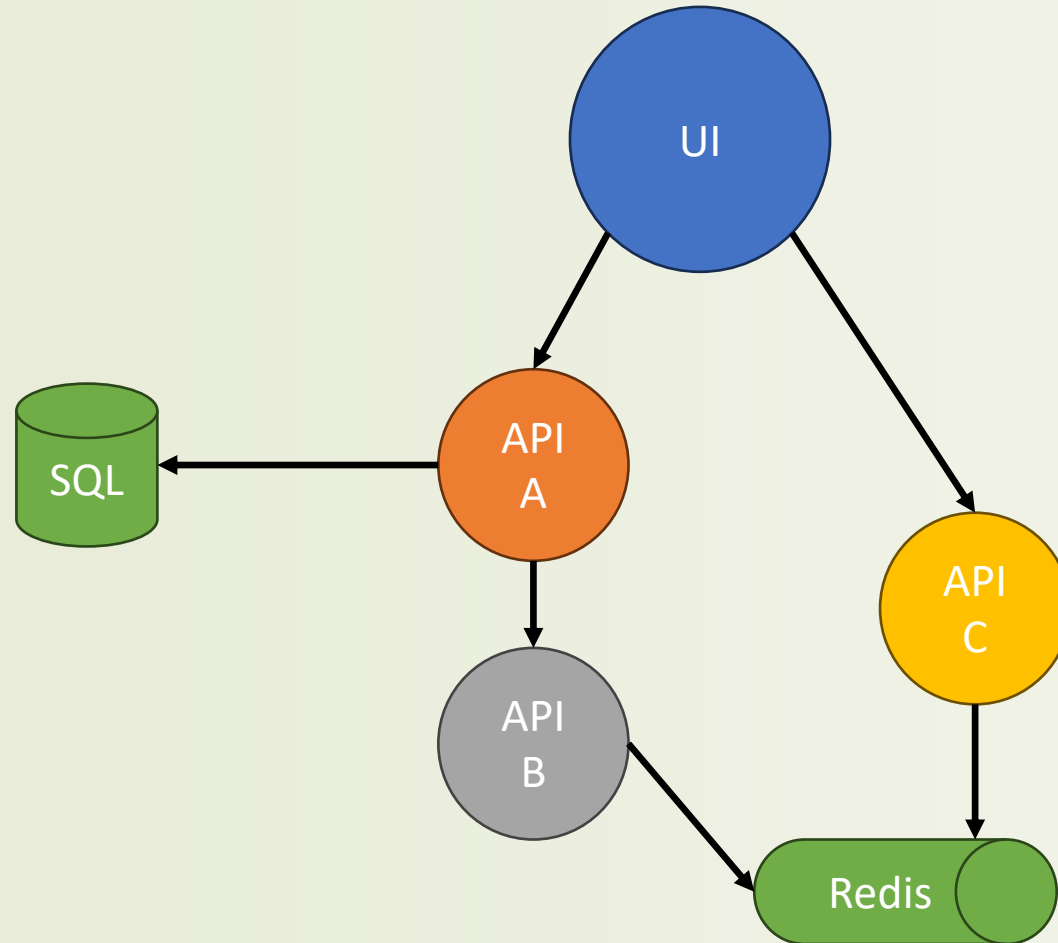- Optional: AES256-Crypto Service Demo

Snapbean
Software GmbH

.NET Aspire

- Cloud-ready Stack für verteilte Anwendungen

- Übernimmt Orchestrierung von Projekten und Services

- Einbindung via NuGet Pakete

Snapbean
Software GmbH

.NET Aspire

.NET Aspire

Demo Time !

Snapbean
Software GmbH

.NET Aspire
Deployment

- Aspire Manifest (JSON)
  - Beschreibt Apps, Services und Verbindungen

- Deployment nach Azure
  - Azure Container Apps

- Deployment nach Kubernetes
  - .NET Aspire JSON -> Kubernetes YAML

Snapbean
Software GmbH

.NET Aspire
Deployment

```
dotnet run --project path-to-project --publisher manifest --output-path aspire-manifest.json
```

```json
{
  "resources": {
    "postgres": {
      "type": "container.v0",
      "connectionString": "Host={postgres.bindings.tcp.host};Port={postgres.bindings.tcp.port};Username=postgres;Password={postgres-password.value}",
      "image": "docker.io/library/postgres:16.2",
      "env": {
        ...
        "POSTGRES_USER": "postgres",
        "POSTGRES_PASSWORD": "{postgres-password.value}"
      },
      ...
    },
    "db": {
      "type": "value.v0",
      "connectionString": "{postgres.connectionString};Database=db"
    },
    "api": {
      "type": "project.v0",
      "path": "../AspireDemo.Api/AspireDemo.Api.csproj",
      "env": {
        ...
        "ConnectionStrings__db": "{db.connectionString}"
      },
      ...
    },
    "web": {
      "type": "project.v0",
      "path": "../AspireDemo.Web/AspireDemo.Web.csproj",
      "env": {
        ...
        "services__api__http__0": "{api.bindings.http.url}",
        "services__api__https__0": "{api.bindings.https.url}"
      },
      ...
    },
    "postgres-password": {
      "type": "parameter.v0",
      "value": "{postgres-password.inputs.value}",
      "inputs": {
        "value": {
          "type": "string",
          "secret": true,
          "default": {
            "generate": {
              "minLength": 22
            }
          }
        }
      }
    }
  }
}
```

Snapbean
Software GmbH

Vielen Dank 🙏

Ralph Bodmer | @ralphbodmer
Manu Sidler | @manuelsidler

Snapbean
Software GmbH