

# Comparison between Blazor WebAssembly (WASM) and Blazor Progressive Web App (PWA)

## High-Level Concept

Concept	Meaning
<b>Blazor WASM</b>	A <b>hosting model</b> where the Blazor app runs entirely in the browser using WebAssembly
<b>Blazor PWA</b>	A <b>feature set</b> that adds installability, offline support, and caching to a Blazor WASM app

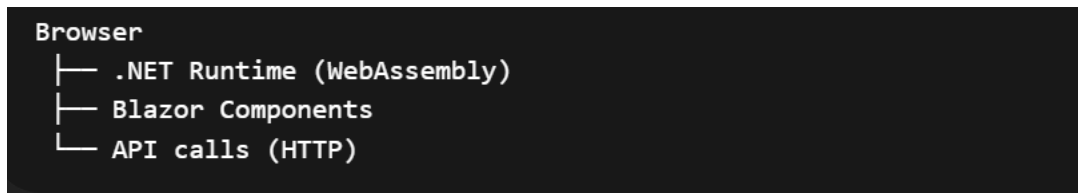
## Key takeaway:

**Blazor PWA = Blazor WASM + PWA capabilities**

Blazor WebAssembly (WASM)

## What it is

Blazor WASM allows you to run **.NET code directly in the browser** using WebAssembly, without requiring a server for UI rendering.



## Key Characteristics

Aspect	Description
Execution	Runs fully in the browser
Server dependency	Only for APIs
Offline support	✗ Not by default
Installable	✗ No
Performance	Initial load can be slower

Aspect	Description
Hosting	Static hosting (Azure Static Web Apps, IIS, etc.)

### Typical Use Cases

- SPA applications
- Client-heavy UI
- API-driven systems
- SaaS dashboards

Blazor Progressive Web App (PWA)

### What it is

A **Blazor WASM app enhanced with PWA features**, enabling it to behave like a **native application**.

### What PWA Adds

Feature	Provided By
Install on device	Web App Manifest
Offline support	Service Worker
Asset caching	Service Worker
App-like UI	Full-screen, icon, splash screen
Faster reload	Cached resources

## Architecture

### Code

#### Browser / Installed App

- └ Blazor WASM
- └ Service Worker
- └ Cached Assets
- └ API calls (optional offline)

## Typical Use Cases

- Mobile-friendly apps
- Offline-first applications
- Field service apps
- E-commerce catalogs
- Internal enterprise tools

## Side-by-Side Comparison

Feature	Blazor WASM	Blazor PWA
Hosting model	✓ Yes	✗ No (uses WASM)
Runs in browser	✓	✓
Installable like app	✗	✓
Offline support	✗	✓
Uses Service Worker	✗	✓
App icon & splash screen	✗	✓
Requires internet always	✓	✗
Mobile experience	Good	Excellent

## Project Creation Difference

### Blazor WASM (Standard)

`dotnet new blazorwasm`

### Blazor WASM with PWA Enabled

`dotnet new blazorwasm --pwa`

What the `--pwa` flag adds:

- `service-worker.js`
- `service-worker.published.js`
- `manifest.webmanifest`
- Offline caching configuration

## Real-World Analogy

Technology	Analogy
Blazor WASM	A website running in the browser
Blazor PWA	That same website installed as a mobile/desktop app