UCLL
HOGESCHOOL

How to write cloud-native .NET applications using Microsoft Orleans?

Johnny Hooyberghs

Here's Johnny

in Johnny Hooyberghs

🐦 @djohnnieke

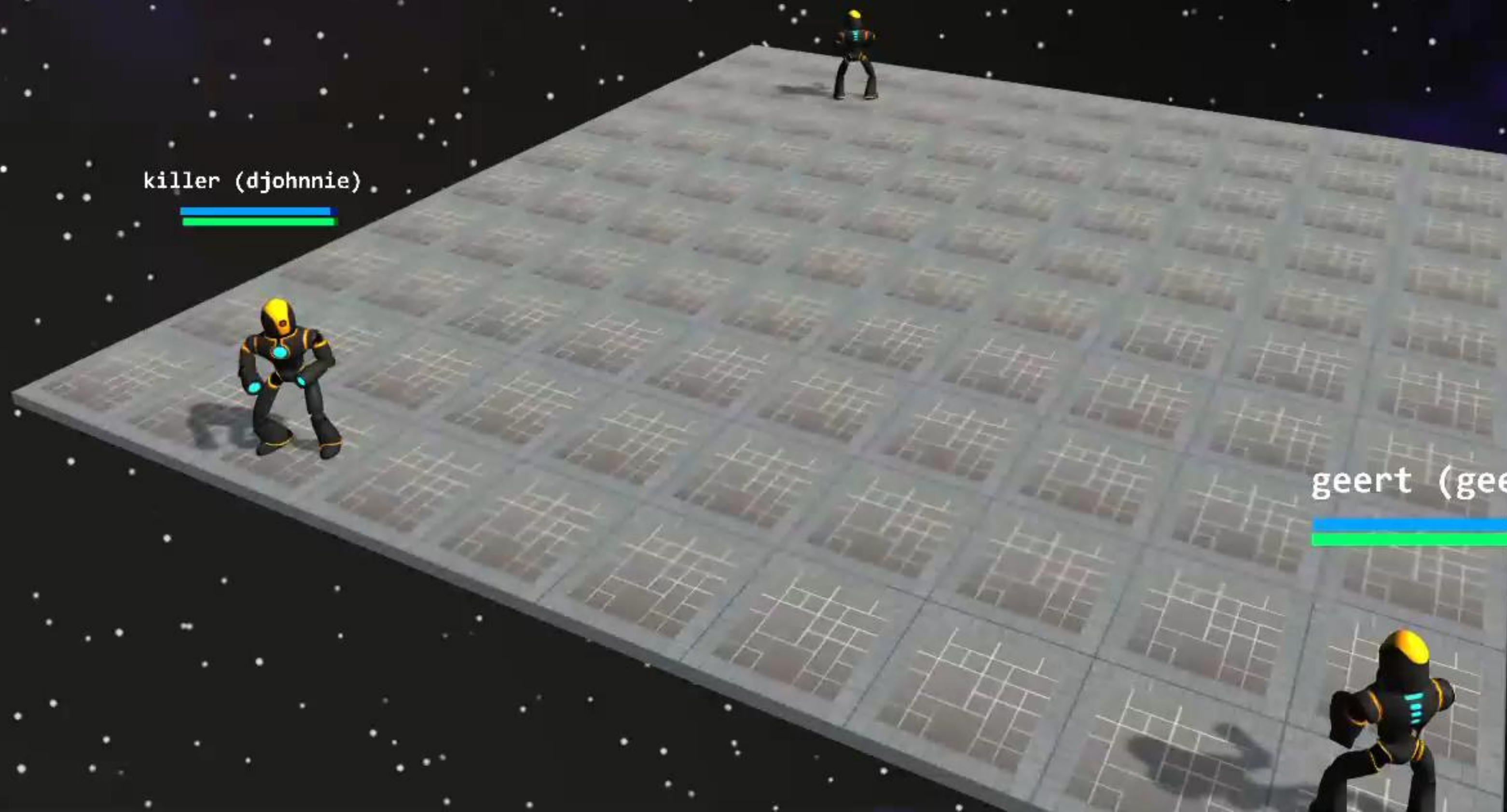✉ johnny.hooyberghs@involved.be

MVP Microsoft® Most Valuable Professional

- Passionate Developer
- Principal Software Consultant/Architect (.NET)
- Microsoft MVP, Developer Technologies
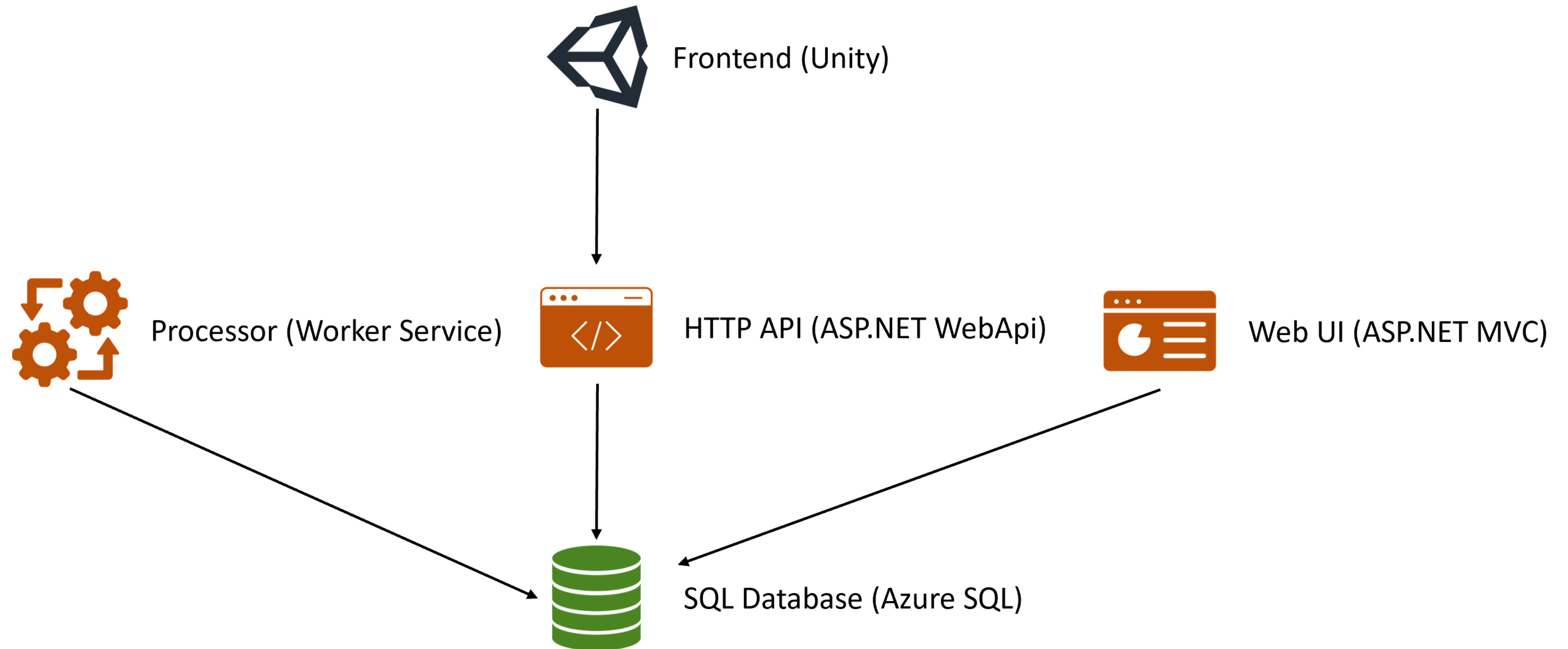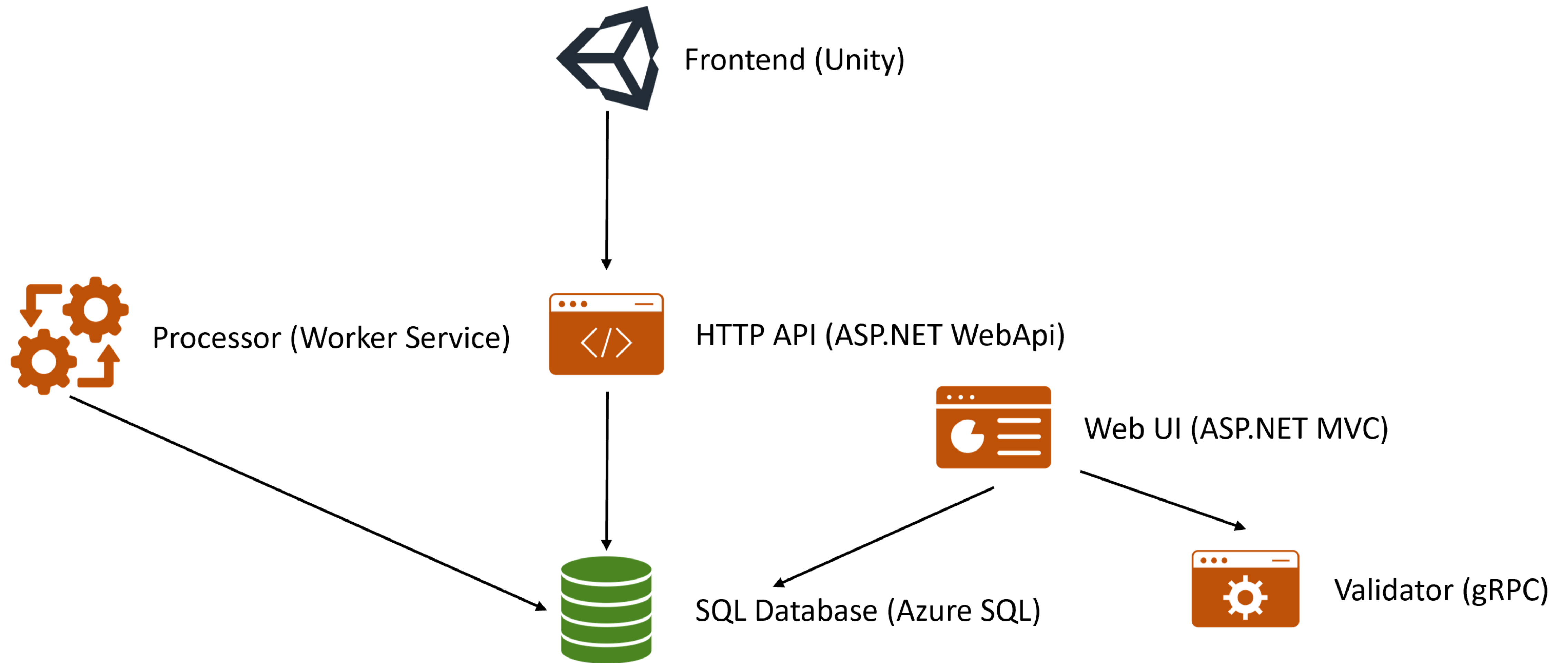- Operational Manager at Involved

CSharpWars

```csharp
var step = LoadFromMemory<Int32>("STEP");
if( step % 3 == 0 )
{
    TurnLeft();
}
else
{
    WalkForward();
}
step++;
StoreInMemory<Int32>("STEP", step);
```

CSharpWars (first version)

Frontend (Unity)

Processor (Worker Service)

HTTP API (ASP.NET WebApi)

Web UI (ASP.NET MVC)

SQL Database (Azure SQL)

CSharpWars (second version)
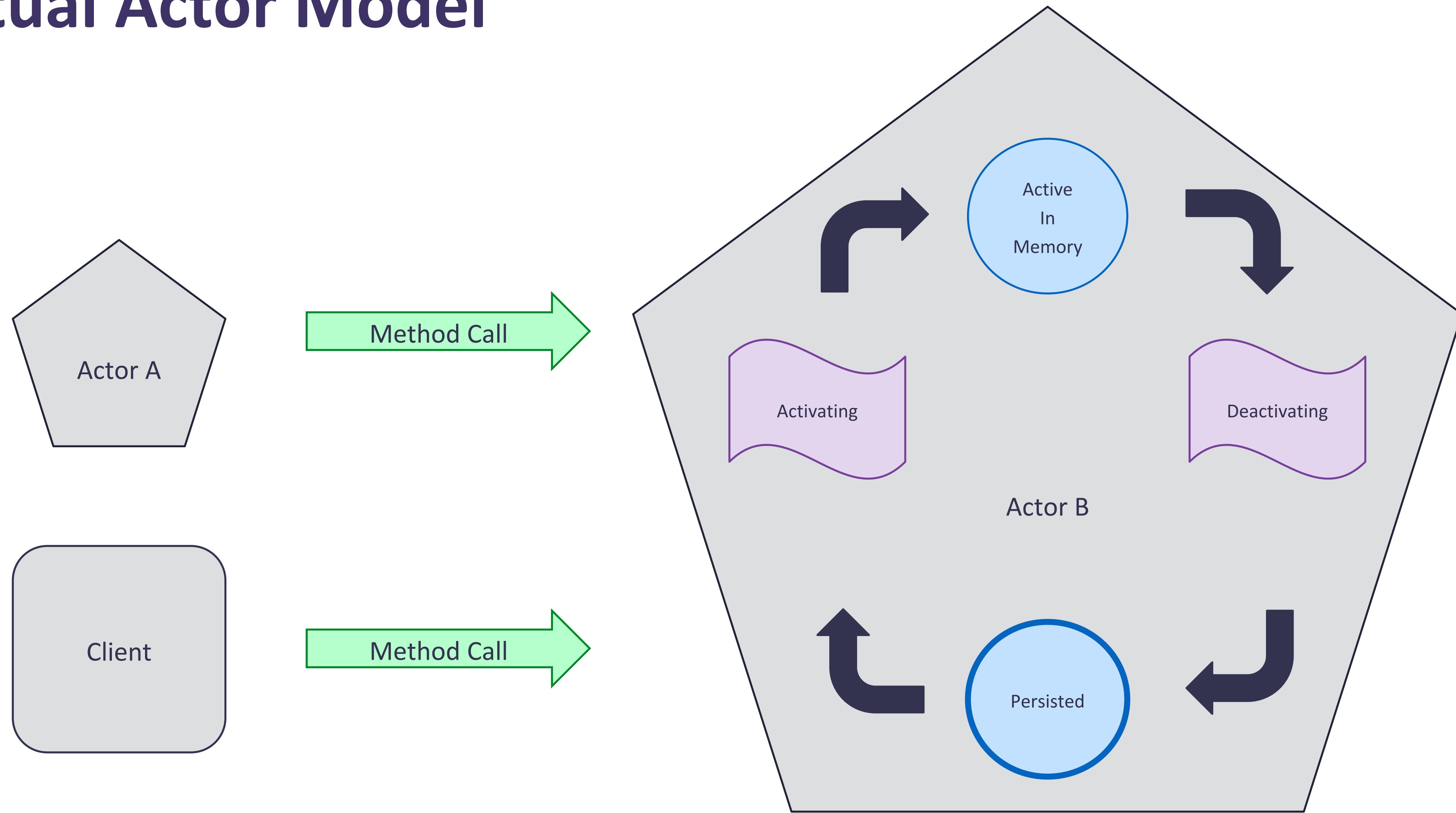
Frontend (Unity)

Processor (Worker Service)

HTTP API (ASP.NET WebApi)

Web UI (ASP.NET MVC)

SQL Database (Azure SQL)

Validator (gRPC)

https://github.com/Djohnnie/CloudNativeOrleans-UCLLTechInspirationDay-2023

Virtual Actor Model

Actor A

Client

Method Call

Method Call

Active In Memory

Activating

Deactivating

Actor B

Persisted

https://github.com/Djohnnie/CloudNativeOrleans-UCLLTechInspirationDay-2023

Grains

player/djohnnie   In-Memory or persisted

(Player)Grain = identity + behavior [+ state]

PlayerGrain : Grain, IPlayerGrain

Silos

CSharpWars (Orleans version)

Frontend (Unity)

HTTP API (ASP.NET WebApi)

Web UI (ASP.NET MVC)

Orleans Silo

Azure Storage (Blob Storage)

Orleans Silo (validation)
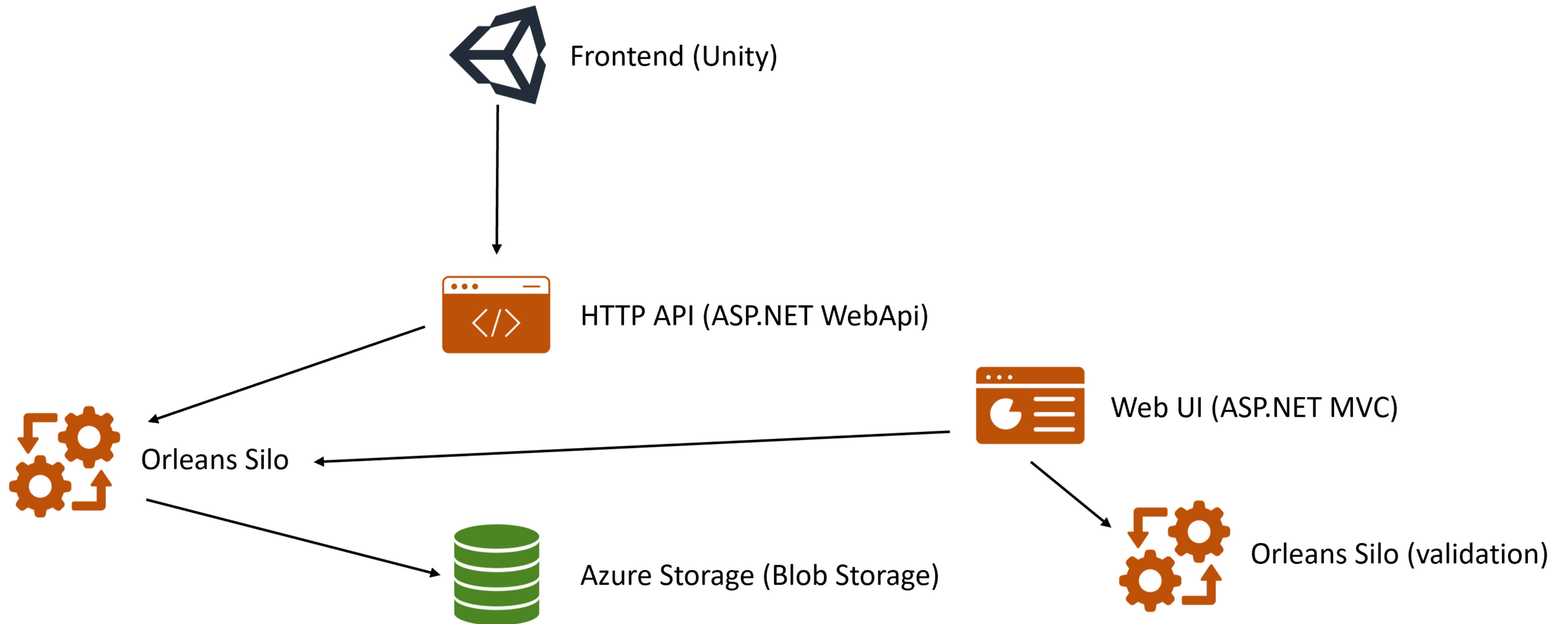
CSharpWars demo

Try it for yourself: https://web.csharpwars.com

Grains

player/djohnnie

In-Memory or persisted

$$\text{(Player)Grain} = \text{identity} + \text{behavior} \ [\ +\ \text{state}]$$

PlayerGrain : Grain, IPlayerGrain

Grains

- Grain Identity

- Persistence & State

- Timers and Reminders

- Placement

- Activation GC

Silos

PlayerGrain	ArenaGrain	BotGrain	ValidationGrain
ArenaGrain	PlayerGrain	ScriptGrain	ValidationGrain
BotGrain	PlayerGrain	BotGrain	
ScriptGrain	BotGrain	ScriptGrain	
BotGrain	ScriptGrain	BotGrain	
ScriptGrain		ScriptGrain	
PlayerGrain			

Silos

- Hosting
- Clients
- Heterogeneous silos

Questions?

in Johnny Hooyberghs

🐦 @djohnnieke

✉ johnny.hooyberghs@involved.be

github.com/Djohnnie/CloudNativeOrleans-UCLLTechInspirationDay-2023

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@involved_it

Veldkant 35C, 2550 Kontich