An Overview to Game Development Using Rust

A Toxic Relationship With Rust

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Where am I?

Bevy Game Engine

Bevy is an open-source data-driven game engine built in Rust.

- It emphasizes simplicity, modularity, and performance.
- Bevy uses an Entity-Component-System (ECS) architecture.
- It provides a range of features including 2D/3D rendering, audio, input handling, and more.

Where am I?

Advantages of Bevy

- **Rust Language**: Memory safety without garbage collection, zero-cost abstractions, and fearless concurrency.
- **ECS Architecture**: Promotes clean code organization, scalability, and high performance through data-oriented design.
- **Cross-Platform**: Deploy to Windows, macOS, Linux, Web (WASM), iOS, and Android from a single codebase.
- **Open Source**: MIT/Apache 2.0 licensed, actively maintained by a vibrant community.
- **Code-Driven**: Pure code workflow with no lock-in to proprietary editors (Official editor in development).
- **Modular Design**: Use only what you need - built as a collection of plugins you can mix and match.

Bevy vs Other Engines

Godot

Unity

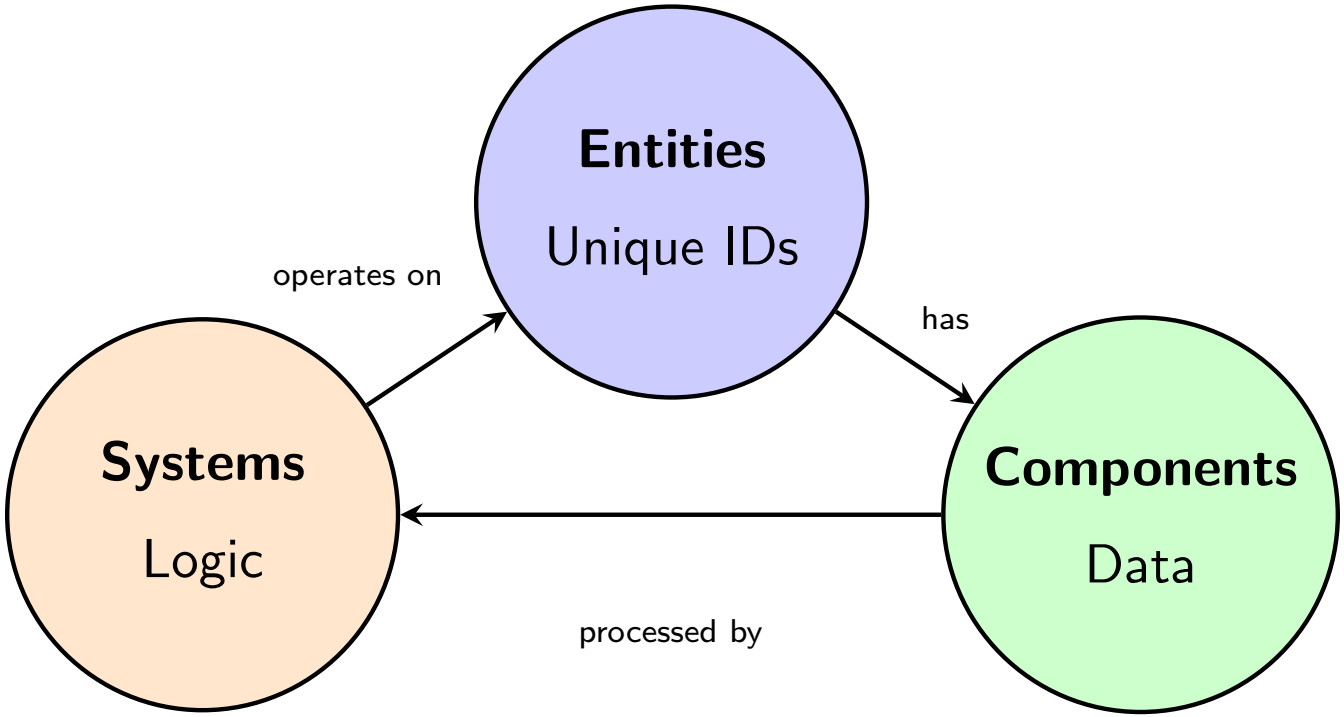
Unreal Engine

- **Lightweight**: Lightweight compared to larger engines.
- **Flexibility**: More control over low-level systems and architecture.
- **Paradigm**: ECS is still not really popular in general.

Where am I?

Outline

Entity-Component-System (ECS)



Entities

Unique identifiers representing objects in the game world

Components

Data containers that hold attributes of entities

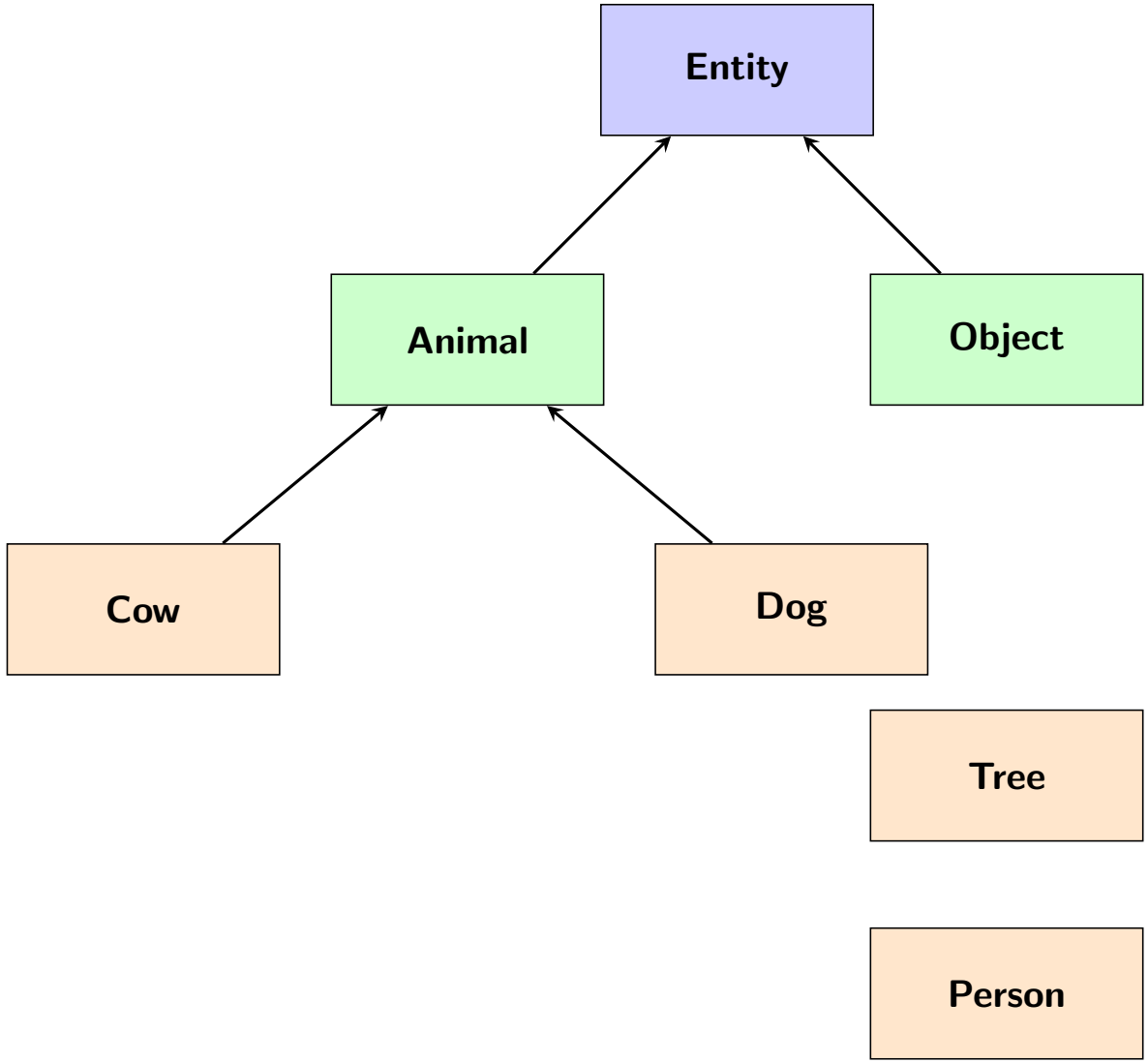
Systems

Logic that operates on entities with specific components

Outline

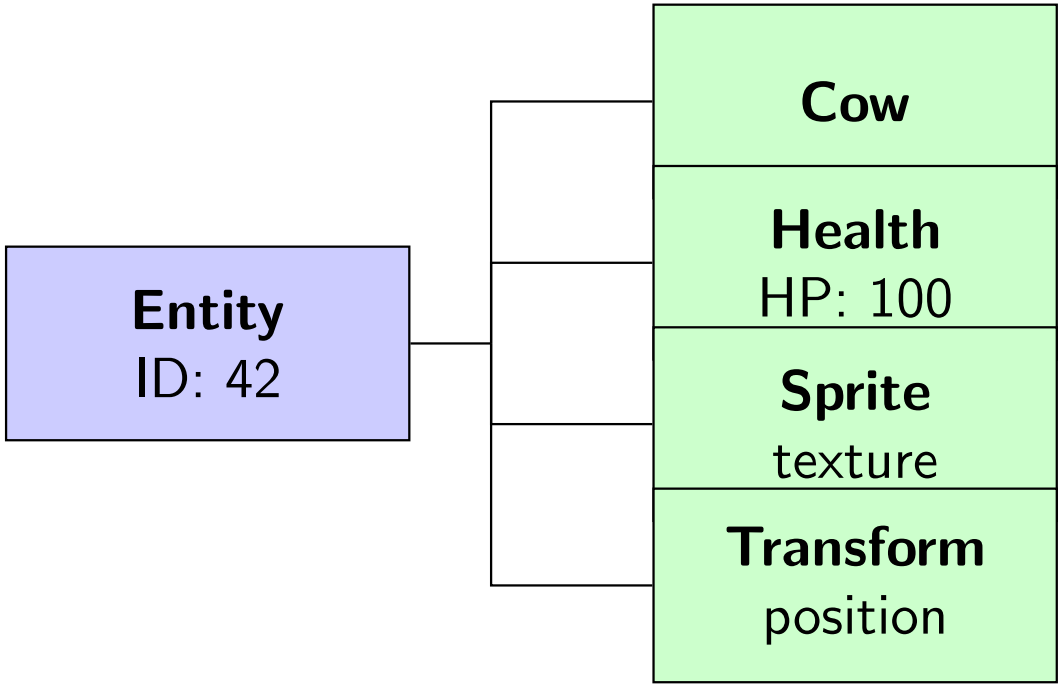
Traditional OOP Approach

Shitty Inheritance Hierarchy



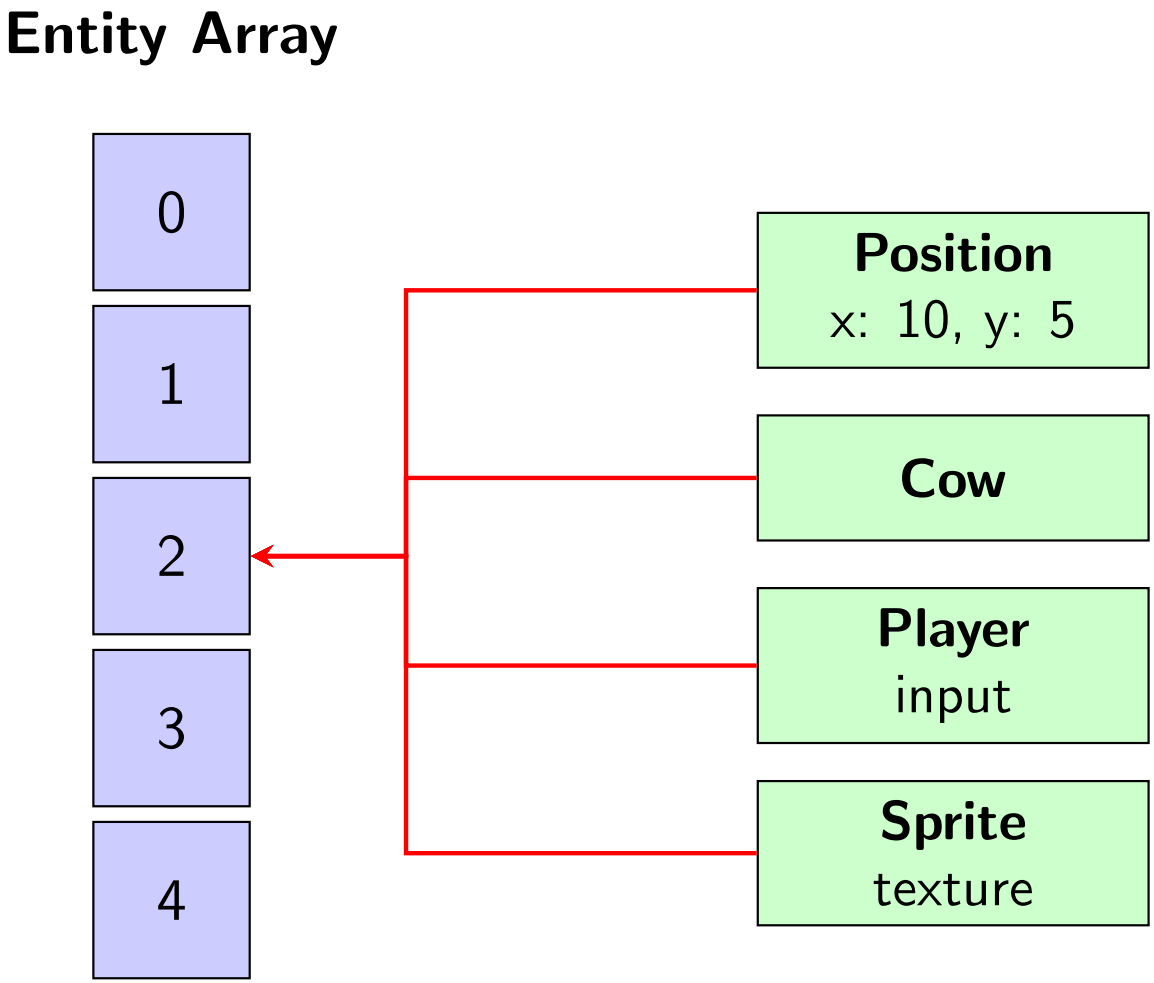
ECS Approach

Nice GIGACHAT and Clean Composition



Outline

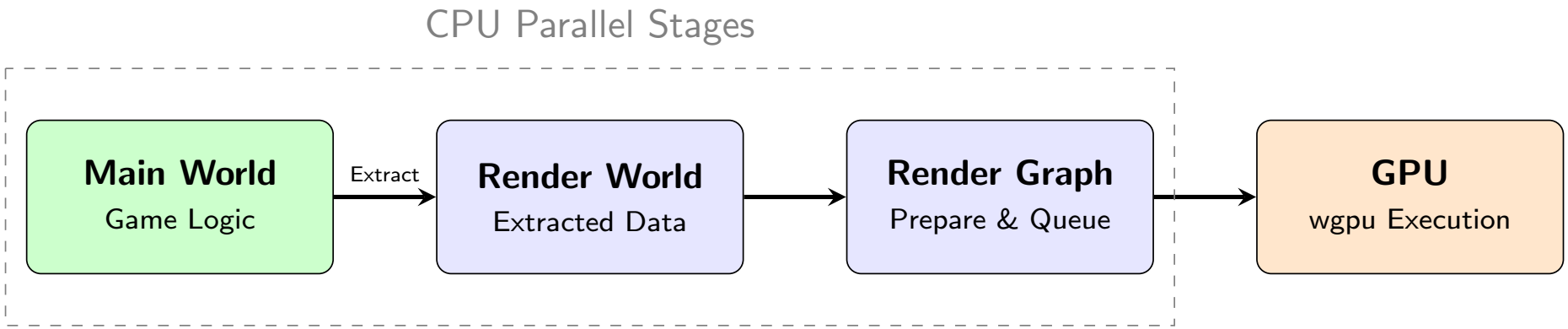
Entities in Bevy



Outline

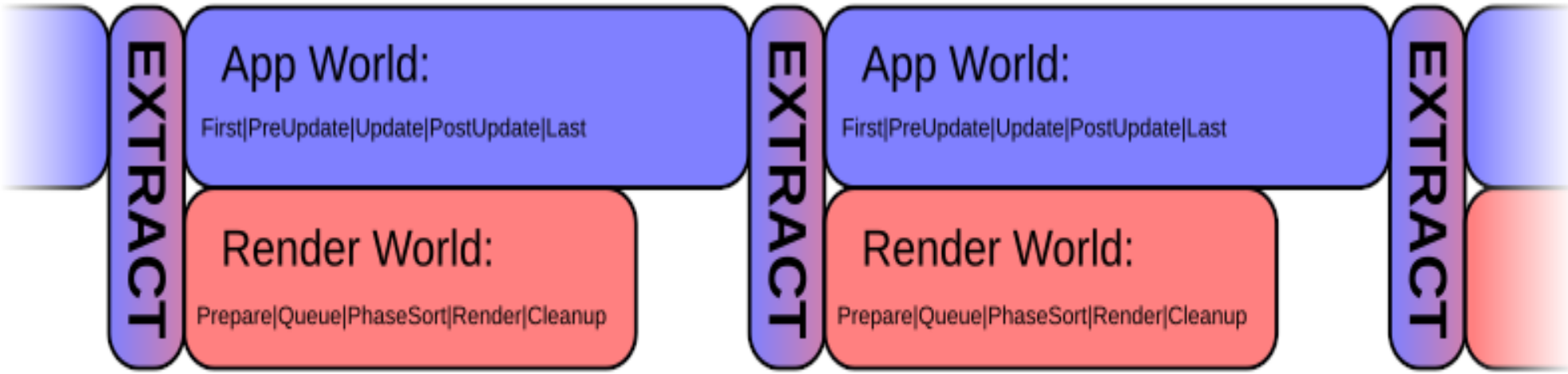
Rendering in Bevy

For more info check https://bevy-cheatbook.github.io/gpu/intro.html

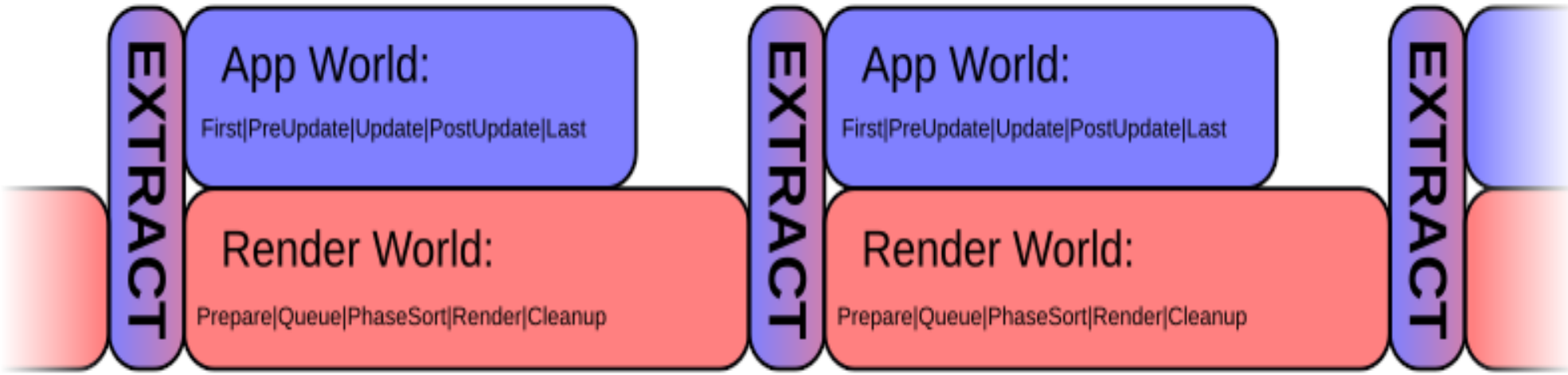


- **Pipelined**: Rendering logic runs in parallel with the next frame's game logic.
- **wgpu**: Modern backend supporting Vulkan, Metal, DX12, and WebGPU.
- **Render Graph**: Modular and customizable rendering passes.

App-Bound Scenario (app takes longer than render):



Render-Bound Scenario (render takes longer than app):



Outline

Resources vs Components

Components

Data attached to entities

- Attached to specific entities
- Multiple instances exist
- Defines object properties
- Examples: Position, Health, Sprite

Resources

Global unique data

- Accessible by all systems
- Only one instance exists
- Defines world state
- Examples: Time, Score, AssetServer

Where am I?

What is this presentation about?

So lets beging with an overview for what we can expect from this presentation.

- What is Bevy?
- Why use Bevy for game development?
- How does bevy works?
- Building a simple game with Bevy.

Where am I?

Where am I?

Two-Column Layout

Left Column

- Perfect for placing text next to an image or a chart.
- This column takes up 50

Right Column Remember to add an image named 'placeholder.png' in your project directory.

Showing Off Some Code

```
fn main() {
    println!("Hello, Beamer!");
}
```

Where am I?

Thank You!

Questions?