Entity Component System

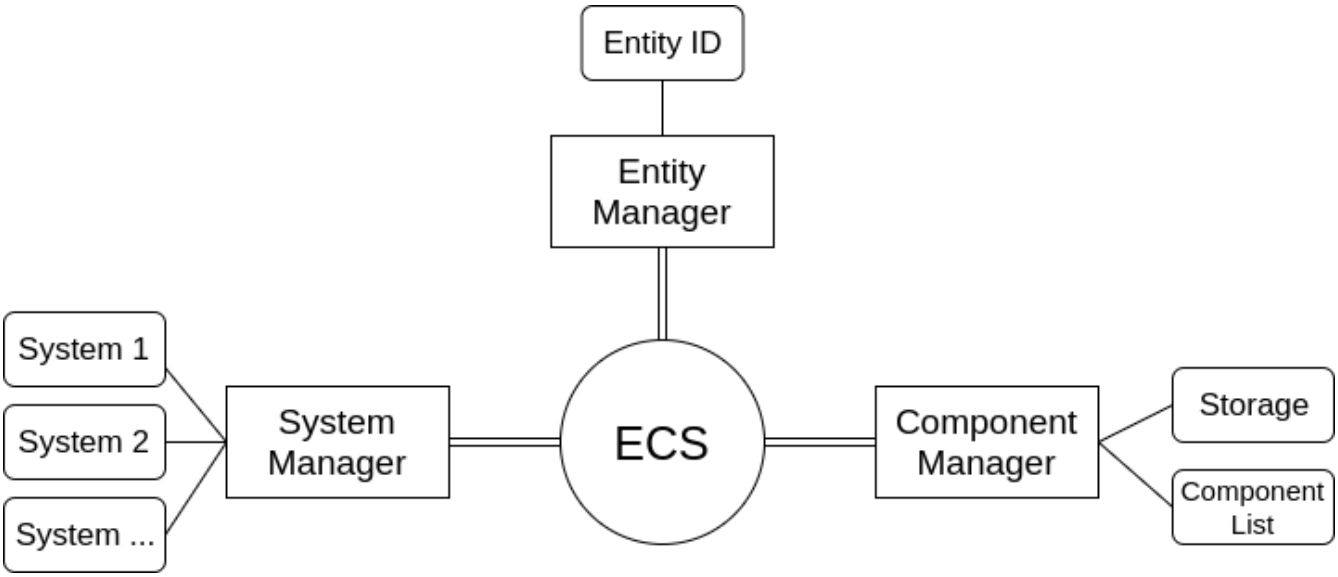
Definition

Entity–Component–System (ECS) is an architectural pattern that is mostly used in game development. ECS follows the composition over inheritance principle that allows greater flexibility in defining entities where every object in a game's scene is an entity (e.g. enemies, bullets, vehicles, etc.).

Every entity consists of one or more components which add behavior or functionality. Therefore, the behavior of an entity can be changed at runtime by adding or removing components.

This eliminates the ambiguity problems of deep and wide inheritance hierarchies that are difficult to understand, maintain and extend.

Explanation



Entities are nothing but IDs. Entities take Components.

A component is a data structure.

A Storage stores the components and links them to the entities. A storage keeps in memory all the entities which have a certain component. Each entity has in the corresponding storage all the information related to their component.

We can interact with entities owning certain components thanks to systems. A system only manipulates the entities having the desired components.

A system defines the rules and limits of the game.