

# Movement

Player movement is controlled by the `handle_movement` function in the player script, which is called in `_physics_process`. It uses the `direction` variable that is synced from the `player_input` node.

`player_input` generated the direction vector based on the direction the player intends to move relative to the camera, i.e. the movement keys are used to determine the 2D horizontal movement vector, which is then rotated according to the orientation of the camera.

Jumping is detected in `player_input`, and when a jump occurs, the `jumping` variable is set to true via `rpc`, to ensure that the call is properly detected and handled.

As the 2D horizontal movement direction and jumping are synced variables, the server and all peers can use these two variables to process the movement of a player, while only requiring the camera scene to exist locally. While all peers process the movement of all players, the server syncs the position and orientation of all players with all peers, and thus overrides potential local deviations on peers. Peers process movement only to reduce lag.

Movement speed is a separate variable, with which the resulting velocity gained from the direction vector is multiplied. This movement speed variable is considered a stat that can be changed by talents, buff, debuffs, etc., but in the absence of such modifications movement speed is equal for all players.

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