

# R TYPE PROTOCOL

## Packet structure:

Each packet has:

1. Header: Identifies the type and size of the packet
2. Payload: Contains the data specific to the packet type

## Packet Types:

Packet types	SENDER ⇒ RECEIVER	Description
CONNECT	client ⇒ server	request to join the game
SUCCESS_CONNECT	server ⇒ client	confirm connection with player id
INPUT	client ⇒ server	send player actions (mov, firing)
STATE_UPDATE	server ⇒ client	broadcast updated game state to all clients
DISCONNECT	client ⇒ server	notify server that client is leaving
SUCCESS_DISCONNECT	server ⇒ client	confirm disconnection
ENTITY_CREATE	server ⇒ client	notify client about a new entity
ENTITY_REMOVE	server ⇒ client	notify client to remove an entity

## Header:

The **header** is the first part of every packet. It contains metadata that describes the packet, such as:

- **Packet type:** Identifies the purpose of the packet.
- **Size:** Specifies the total size of the packet, so the receiver knows how much data to process.
- **Timestamp:** Used for synchronization or debugging.

The header allows the receiver to understand what the packet is, how large it is, and how to handle it.

### Header Format:

Offset	Size (Bytes)	Field	Description
0	1	type	packet type
1	4	size	total size of the packet (header + payload)
5	4	timestamp	timestamp for synchronization

### CONNECT Packet:

Offset	Size(Bytes)	Field	Description
9	4	entity_id (int)	entity identifier number
13	variable	name (string)	string of entity name

### SUCCESS\_CONNECT Packet:

Offset	Size(Bytes)	Field	Description
9	4	entity_id (int)	entity identifier number

### INPUT Packet:

Offset	Size(Bytes)	Field	Description
9	4	entity_id	entity identifier number

13	4	mov_x	horizontal movement
17	4	mov_y	vertical movement
21	1	firing	1 = firing , 0 = not firing

### STATE\_UPDATE Packet:

Offset	Size(Bytes)	Field	Description
9	4	entity_id	entity identifier number
13	4	pos_x	X coordinate
17	4	pos_y	Y coordinate
21	4	vel_x	Horizontal velocity
25	4	vel_y	Vertical velocity

### DISCONNECT Packet:

Offset	Size(Bytes)	Field	Description
9	4	entity_id	entity identifier number

### ENTITY\_CREATE Packet:

Offset	Size(Bytes)	Field	Description
9	4	entity_id	entity identifier number
13	4	entity_type	type of player

17	4	pos_x	x coor
21	1	pos_y	y coor

ENTITY\_REMOVE Packet:

Offset	Size(Bytes)	Field	Description
9	4	entity_id	entity identifier number