

Communication Protocol

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1 Description

1.1 SetUp phase

After the server has started with its own port number, a client can connect to the server. The server accepts the request by sending the client a Welcome message containing the lobbies and their parameters. The client can then choose to create a new Game by sending a GameParams message (with the type of game: normal rules or expert mode and the number of players) or to join a lobby by sending a Join message with the lobby's id. These messages also contain parameters such as the Player's NickName and his Mage. The server verifies the uniqueness of these parameters and if any check fails an Error message is sent.

After the connection is initialized the server will send a Ping to the client, who will answer with a Pong (messages with empty body). Every second the server will send a Ping to every client and will wait for a Pong answer from all clients connected. If a client doesn't answer to 5 consecutive pings the server will assume that the connection must be closed. A client can send to the server a Disconnect message to notify that he wants to quit the game. After a client is disconnected he can rejoin the match (using a Join message) by choosing his old nickname, after that the server verifies that a player with the given nickname was playing and in this case the client can continue playing, otherwise an Error message is sent. If remains only a client connected, the game is paused and whether after 50 seconds he is still the only connected client the game ends. If the client doesn't receive a message from the server

for 15 seconds he assumes that a connection error has happened and the game must be closed.

1.2 Planning phase

When all clients needed are connected the game starts and the server sends a GameStart message followed by a SelectAssistant message in a specific order to every client (while to the others clients is sent an info message about who is choosing the assistant) that has to answer with a ChooseAssistant message. When the server receives all the messages it will calculate the turn order.

1.3 Action Phase

The turn is composed of the following phases:

1. The server notifies the correct client by sending a MoveStudentRequest, the client will send 3 messages that can be MoveToIsland or EntranceToHall.
2. The server notifies the correct client by sending a MoveMNRequest, the client will send a MoveMN message. The server will update the model and check if a winning condition is satisfied, in that case it will send to all clients a GameEnded containing the winner's information.
3. The server notifies the correct client by sending a SelectCloud, the client will send a ChooseCloud message.

1.3.1 Character handling

If the game is in Expert mode, during all the action phase the client can send a PlayCharacter in order to activate a Character. The server verifies the availability of this Character and if the player has enough coins and if one of these conditions isn't satisfied an Error message is sent. Once the Character is activated, the following messages sent by the client will determine the Character's ability that will be used during the turn. There are four types of messages that can be sent:

- **ChooseIsland:** If ChooseIsland is sent and the active Character is the number 3, the influence is calculated on the selected island as if Mother

Nature was there, if instead the active Character is the number 5, a No Entry tile is placed on the selected island.

- **ChooseColor:** if ChooseColor is sent and the active Character is the card 9, is set the color that will not be used for calculating the influence, if instead the active Character is the number 11, a student of this color is moved from the card to the SchoolBoard's hall, finally if the active Character is the number 12, three students of the selected color are put back in the bag.
- **ChooseTwoColors:** if ChooseTwoColors is sent and the active Character is the number 7, the two selected students change their positions: the first one from entrance to card and the second one the other way, if instead the activated Character matches the description of card 10, the two selected students change their positions: the first one from hall to entrance and the second one the other way.
- **SpecialMoveIsland:** if SpecialMoveIsland is sent and the active Character is the number 1, the selected student is placed on the chosen island.

At the end of a turn the server will ensure that all the necessary moves have been performed and only in that case it will send a message to all the clients notifying them what's the next player that has to play (or the client that has to choose the assistant).

All messages that are sent during the turn are checked by the server to ensure that the action is legal: it must be appropriate for the current phase and it must be sent from the current player, in case of a failed check an Error message containing the error's description will be sent.

If an action is performed and the Model changes state it will notify the Server so that an updated View can be sent to all Clients.

Under certain circumstances the game must end after the current round so the server will notify all clients with a GameMustEnd message. In the event that a win condition is satisfied the server will send a GameEnded message containing the winner.

2 Sequence Diagram

2.1 SetUp Sequence Diagram

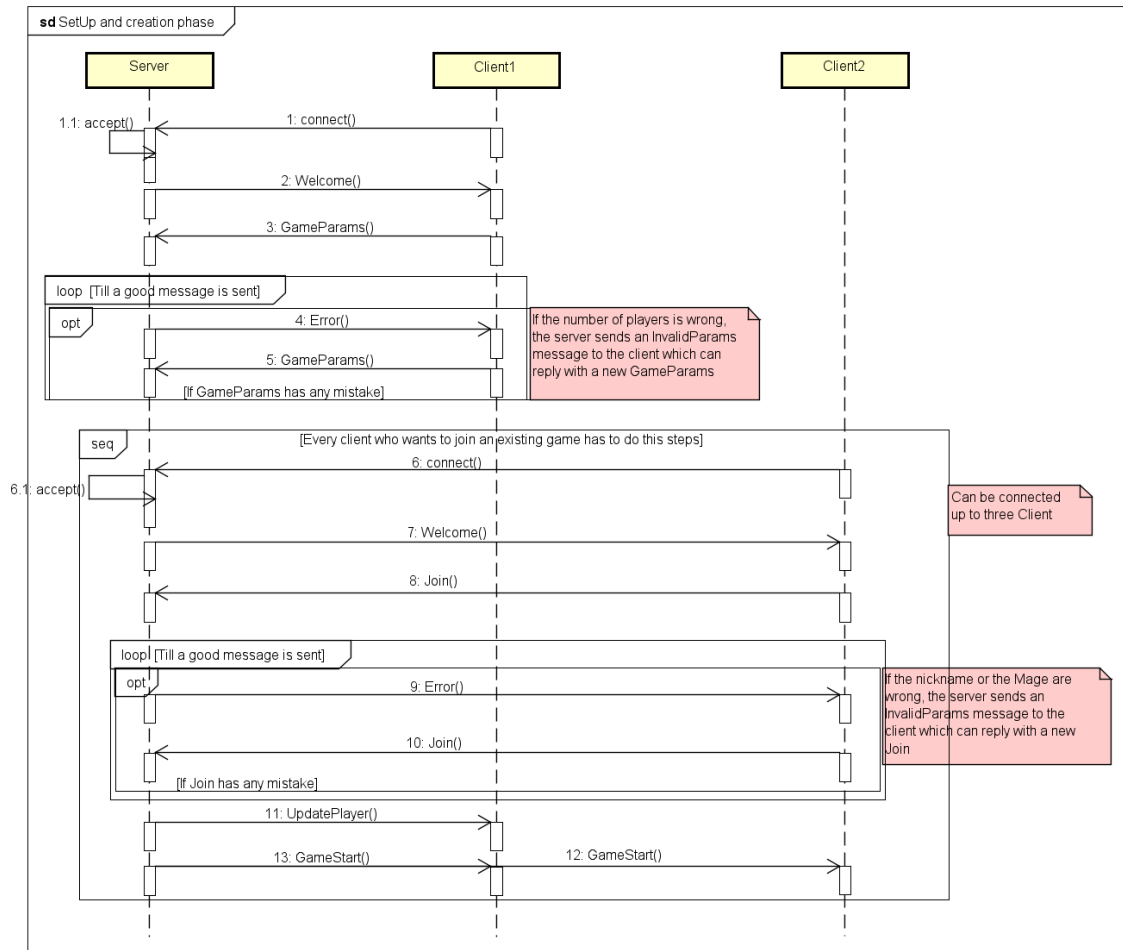


Figure 1: Sequence Diagram of the setup phase of the game.

2.2 Planning phase Sequence Diagram

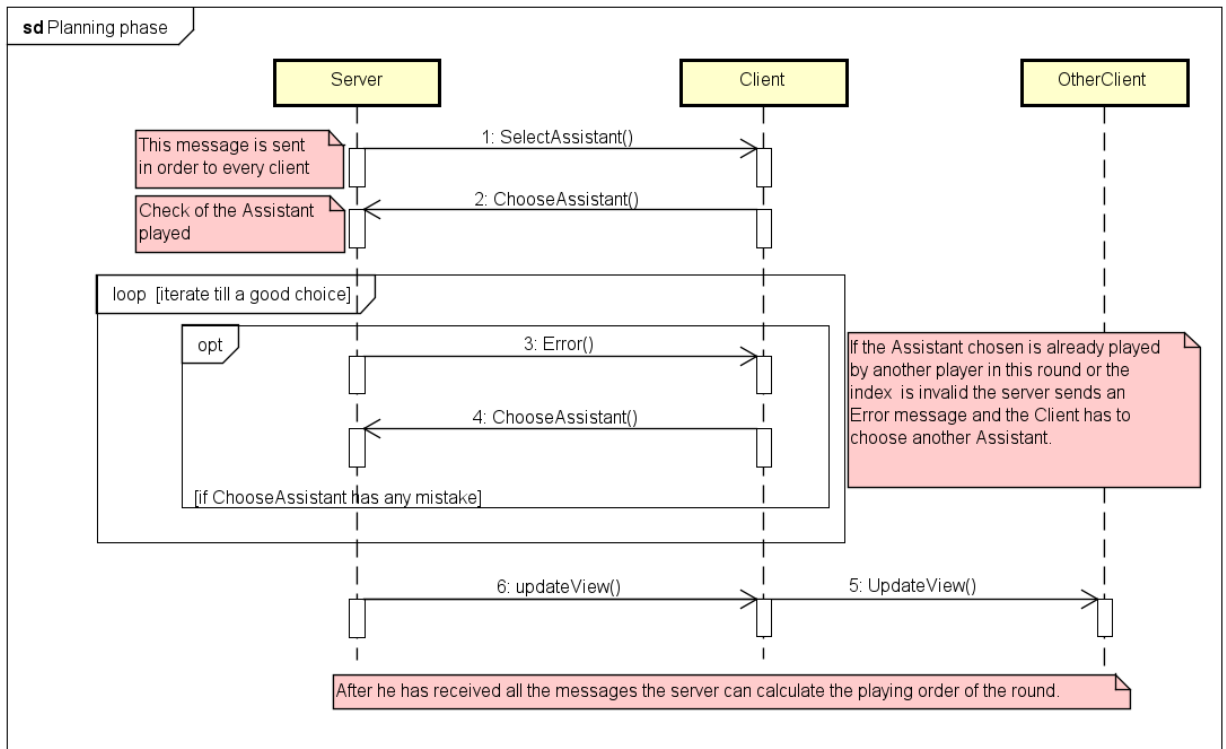


Figure 2: Sequence Diagram of the planning phase of the game.

2.3 Play Character actions Sequence Diagram

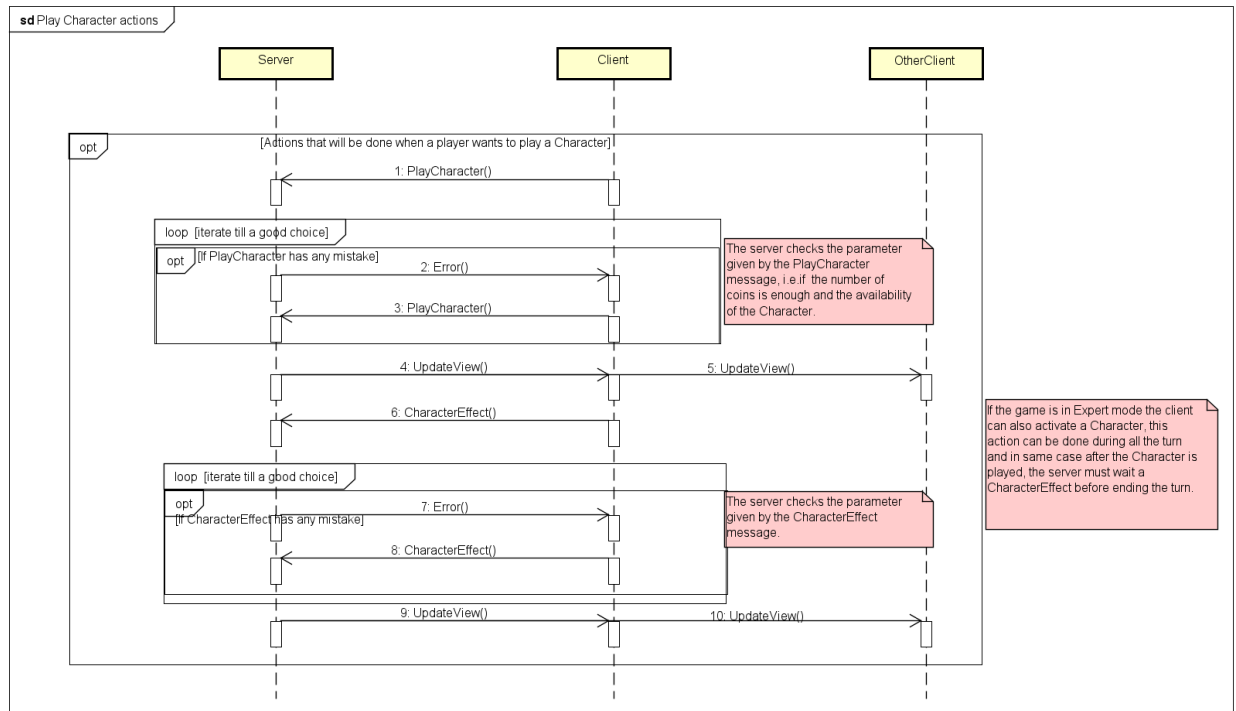


Figure 3: Sequence Diagram of the messages exchanged when playing a Character.

2.4 Action phase Sequence Diagram

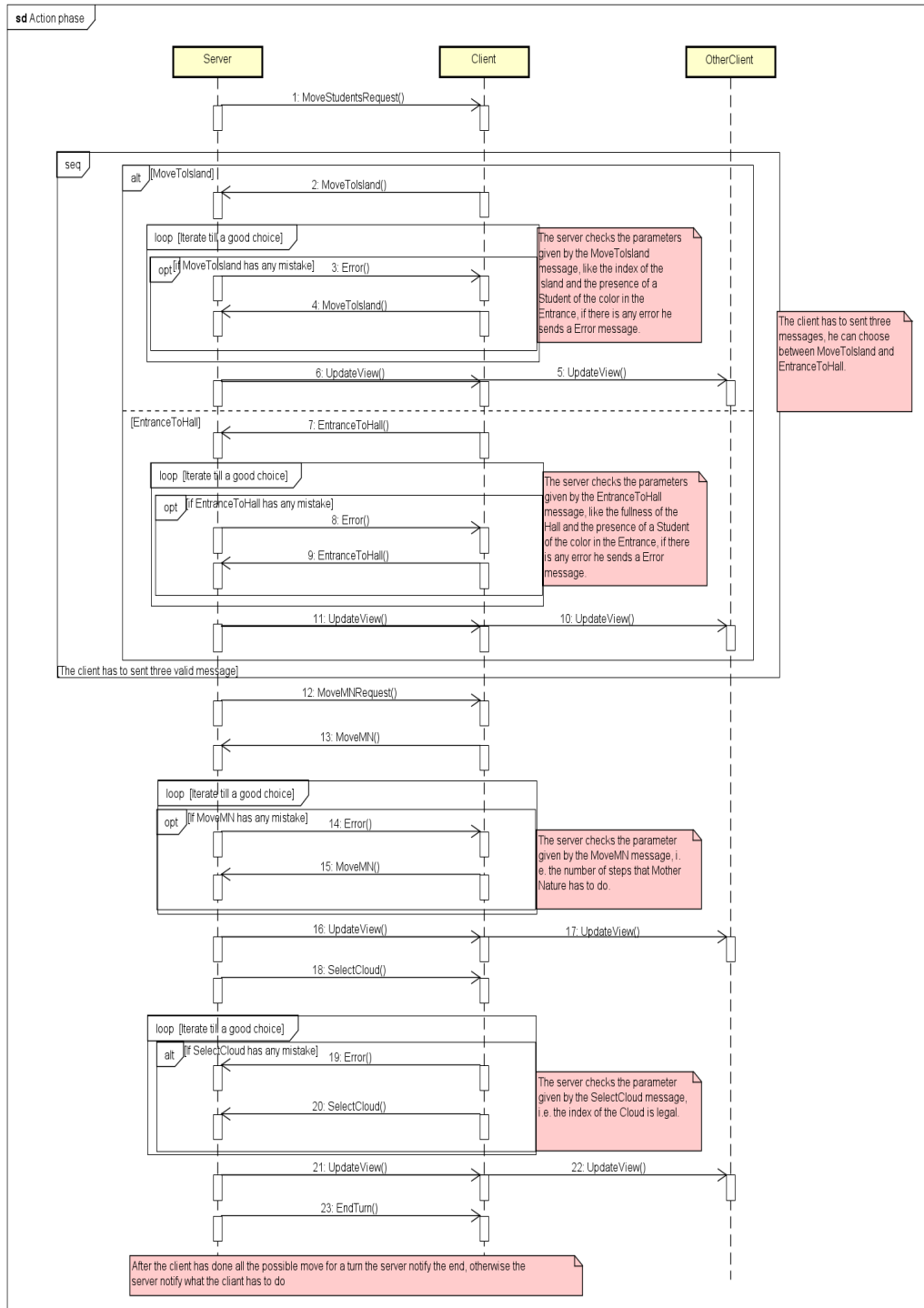


Figure 4: Sequence Diagram of the action phase of the game.