Application protocol

All the messages exchanged between client and server are in json format and contain the field “type”, so the messages handler can parse them correctly.

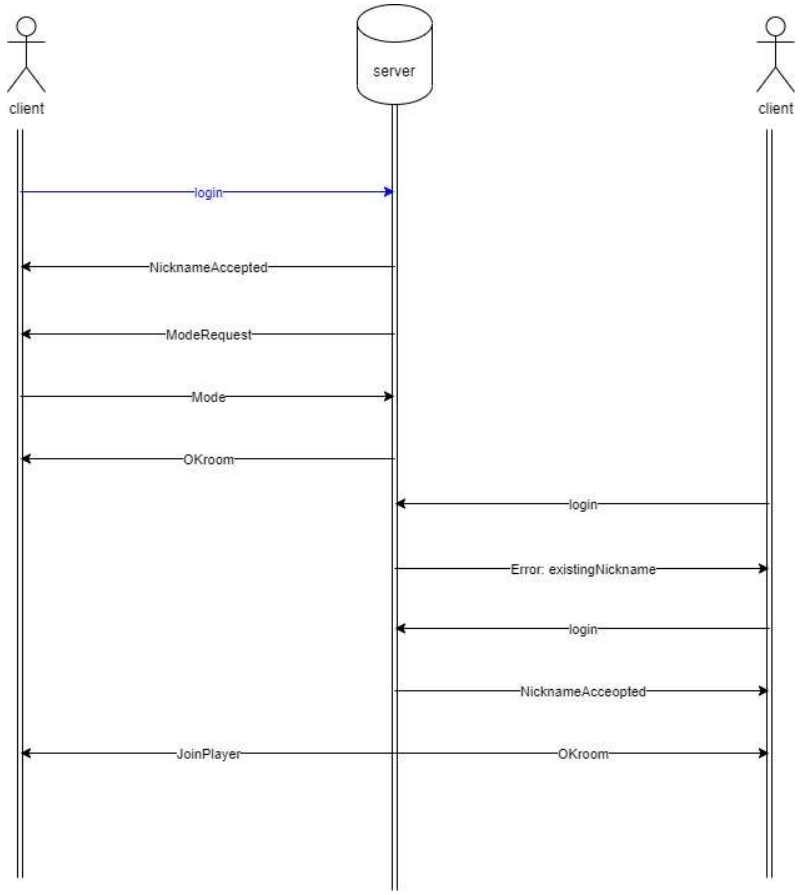
Error management

When a wrong message occurs or the client tries to do something not allowed, the server will send him a json message which fields are “type” = “error” and “errorMessage” which contains a keyword representing the error occurred.

Login

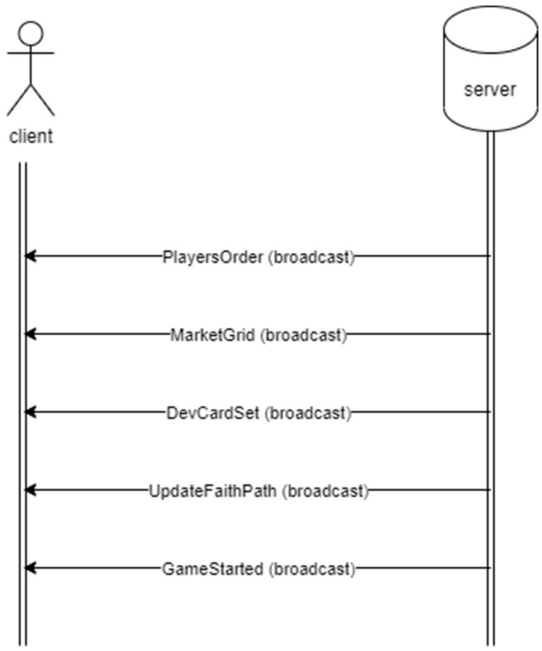
Firstly, a new client must send a login message containing his nickname, then the server checks if the given nickname is already used and then checks if there are waiting rooms available. If there are no waiting rooms, server will send a ModeRequest message. In this case, player must send a Mode message containing the number of players of the game: if the number is correct, the server will answer with an OKroom message that notifies the player the room has just been created.

When a player logs in and a waiting room is available, then the server will send a NicknameAccepted message and an OKroom message, whereas the other players that are in the same waiting room receives a JoinPlayer message containing the new player’s nickname. OKroom contains the size of the waiting room and a list containing the nicknames of the players that are waiting in the same room.



Initialization of the game

When the waiting room reaches the number of players specified by the host, it sends a broadcast PlayersOrder message which contains the turns order, then it starts the game set up: the server sends a sequence of broadcast messages: MarketGrid which contains the market's grid and the outer marble, DevCardSet containing the development cards that can be purchased, UpdateFaithPath containing the starting positions of the players on the faith path and finally GameStarted that notifies that set up is ended.



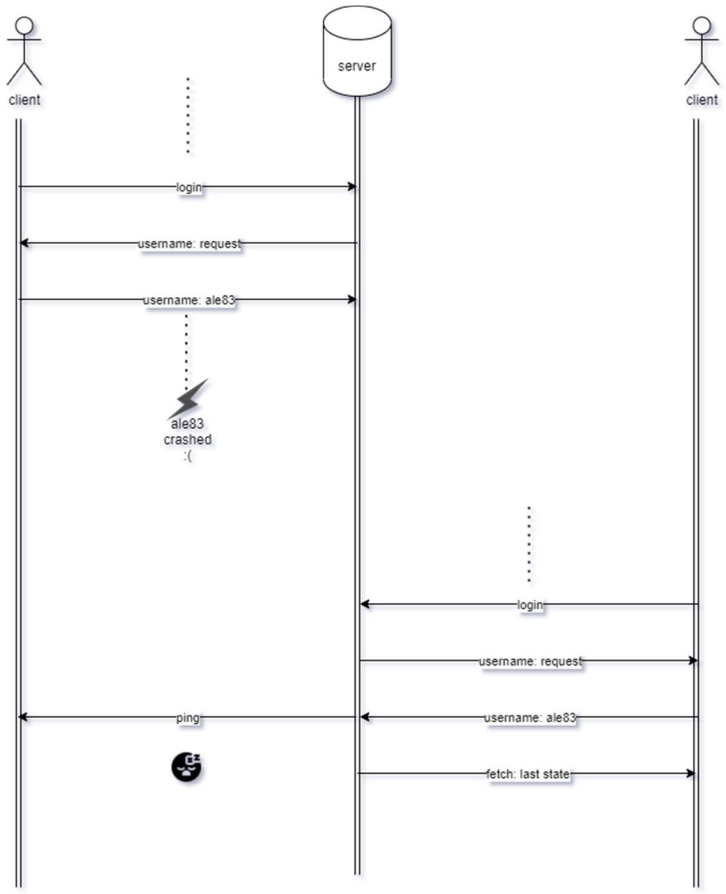
Updates management

Every time a player performs an action that changes his dashboard (development card purchase, resources storage, etc …), the server will send an update message in broadcast, in order to notify all the players that a change happened and to notify the current player that the action performed concluded correctly.

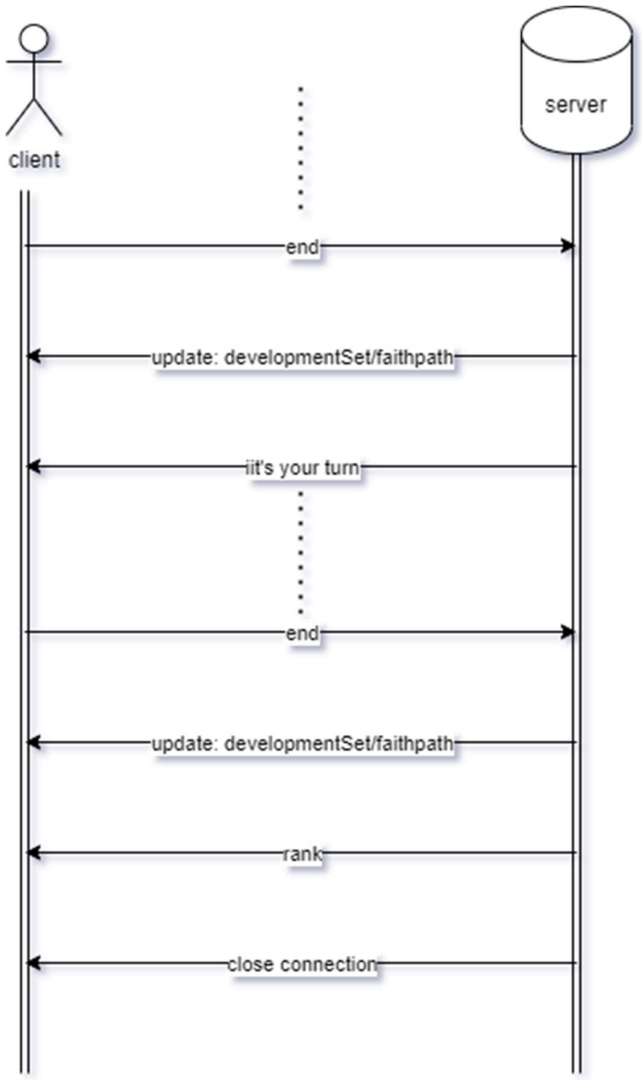
Crash management

If the client crashes down, he can join again using the same username, in this case, the server tries to Ping the client that has crashed down that obviously doesn't reply with a Pong; in this way the server is sure that there was a problem and it assigns the new client to the Identity of the player, after that the server will send a sequence of Rejoin messages in order to fetch the state of the game.

First it will send the same messages sent during the standard initialization of the game, after that it will send to the rejoined player for each player of the game the following messages: RejoinDecks (to fetch the development cards bought by a specified player), RejoinDepot (to fetch resources stocked in a specified player's depot), RejoinExtraSlot (to fetch all the extra resources owned by a specified player), RejoinLeaderCards (to fetch leadercards owned by the specified player) and RejoinStrongbox (to fetch resources owned stocked in a specified player's strongbox).



Single Player



This section is about the differences between Single Player mode from other ones where more than one player plays against each other.

This mode is different from the others only because of the Action Tokens and their activation at the end of each player's turn. The behavior of the Action Tokens is independent from the player decisions, so when one is drawn from the deck, at the end of each player's turns, the client will receive the information about which token has been drawn, through a UpdateDrawToken message, and what happened because its action (updates).

Leader cards

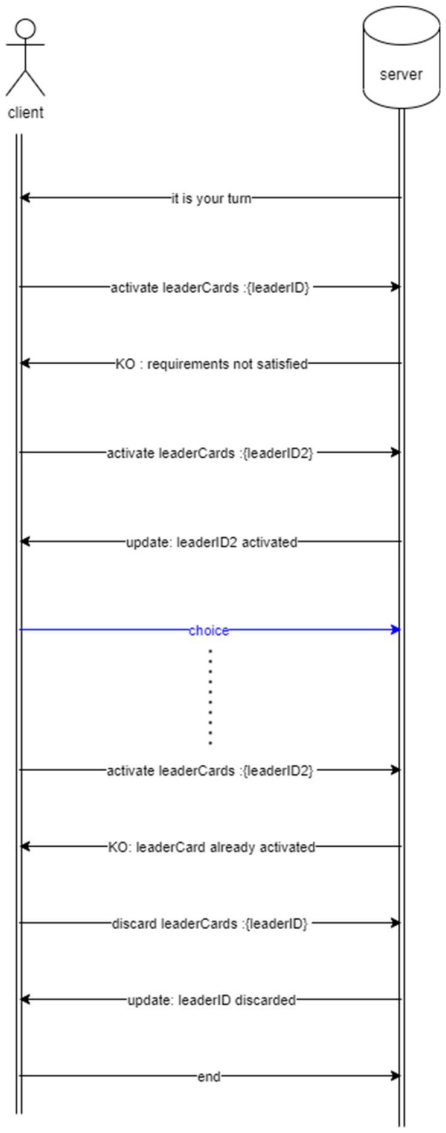
When the client receives the message “It’s your turn”, he can perform the following actions:

- Activate or Discard LeaderCards
- Choose one action between: go to market, activate production, buy a Development Card.

Leadercards can be activated (or discarded) at the beginning or at the end of the turn with an Activate (or Discard) LeaderCards command giving the ID of the LeaderCard.

The choice action can be done once per turn, at the start of the turn or after an Activate or Discard Leadercards command.

If the Client tries to perform this action in a different order or not in in his turn, the server will respond that the action cannot be done.



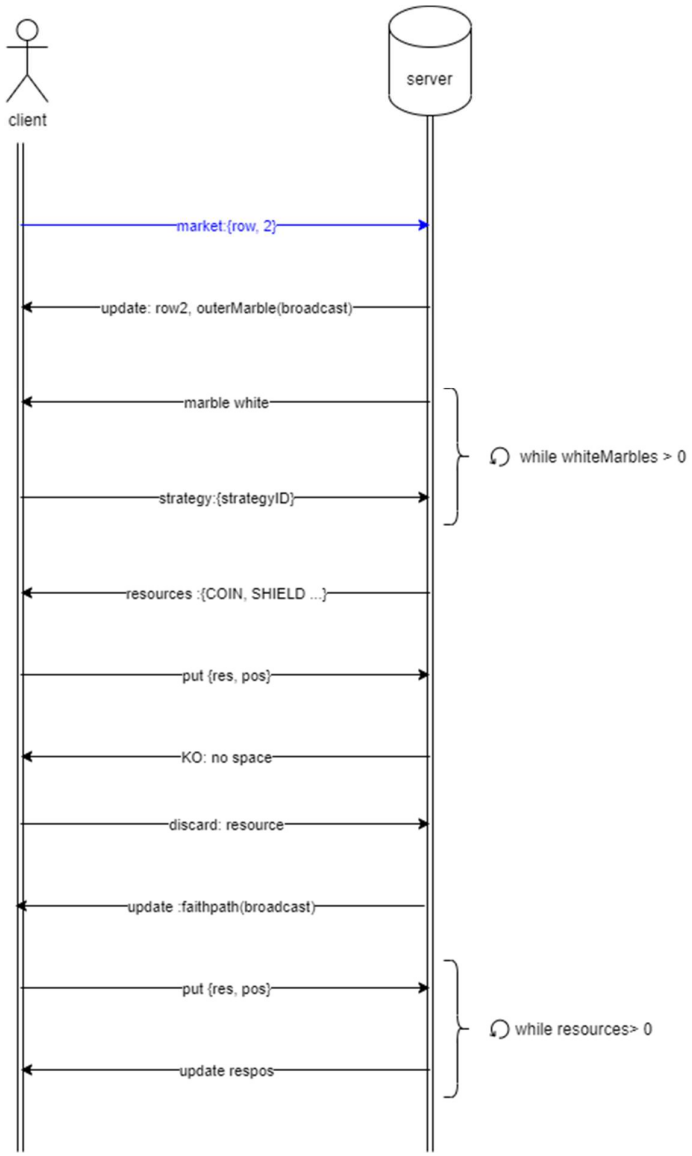
Go to Market

This protocol can follow the first action regarding Leader Cards (possible activation or discard) whether the player chooses to visit the Market.

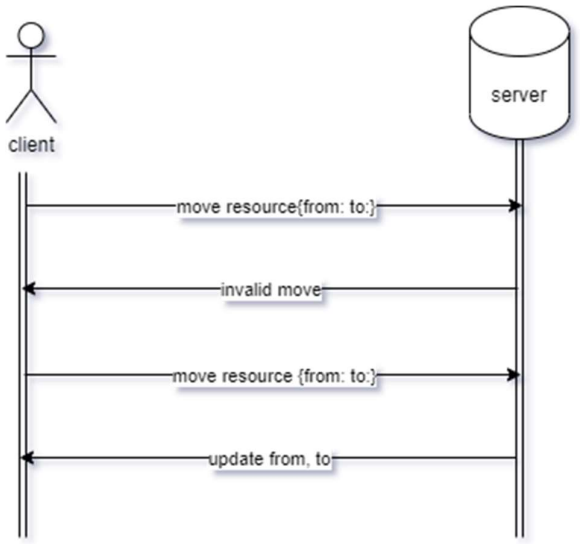
The first part is related to the conversion of the possible White Marbles picked up by the player's action at the market into Resources. There can be two different scenarios where the behavior of the protocol is different:

1. Player has no active Market Strategies to convert the White Marbles: the server will return to the client the list of Resources converted from the Marbles picked up in that turn, assuming that the White ones will not be converted with any Resources.
2. The server sends a message to the client for each White Marble that would occur to know which Strategy he wants to use to convert that Marble; at the end of this the server will send to the client the ultimate list of Resources converted from every Marble picked up in that turn.

The last loop exists to let know the server where to store, inside the Warehouse Depot, the Resources earned from the market. At any iteration, the client can send a put message or a discard one, both always related to only one Resource per time.

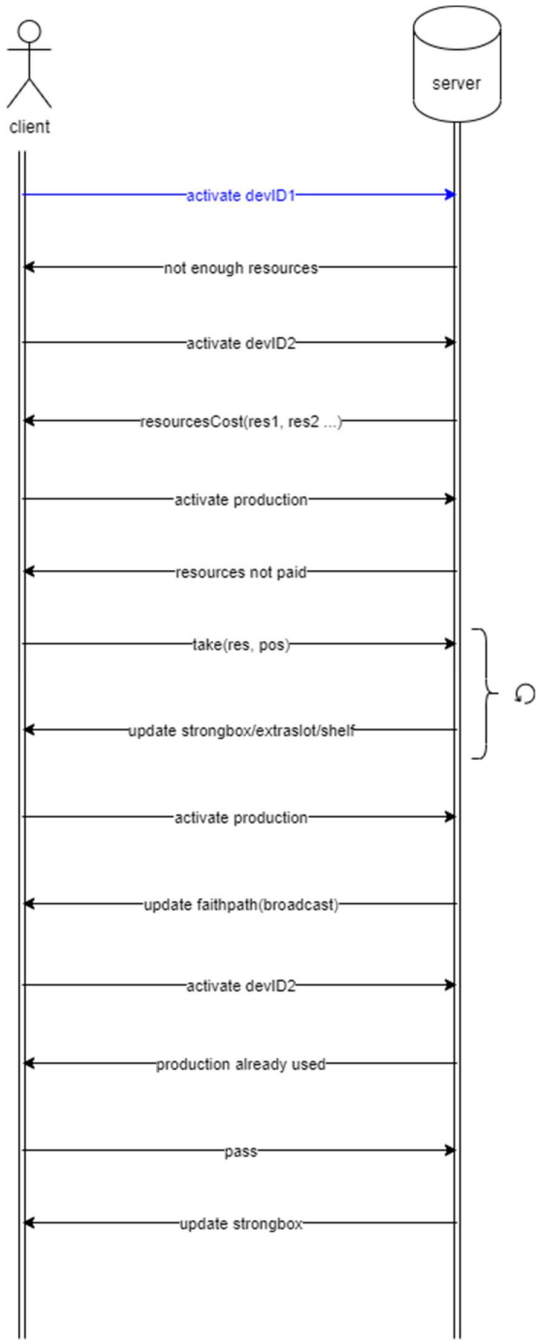


Move Resources



The Player can move Resources inside the Warehouse Depot from a shelf to another one at any time during his turn.

Development card activation



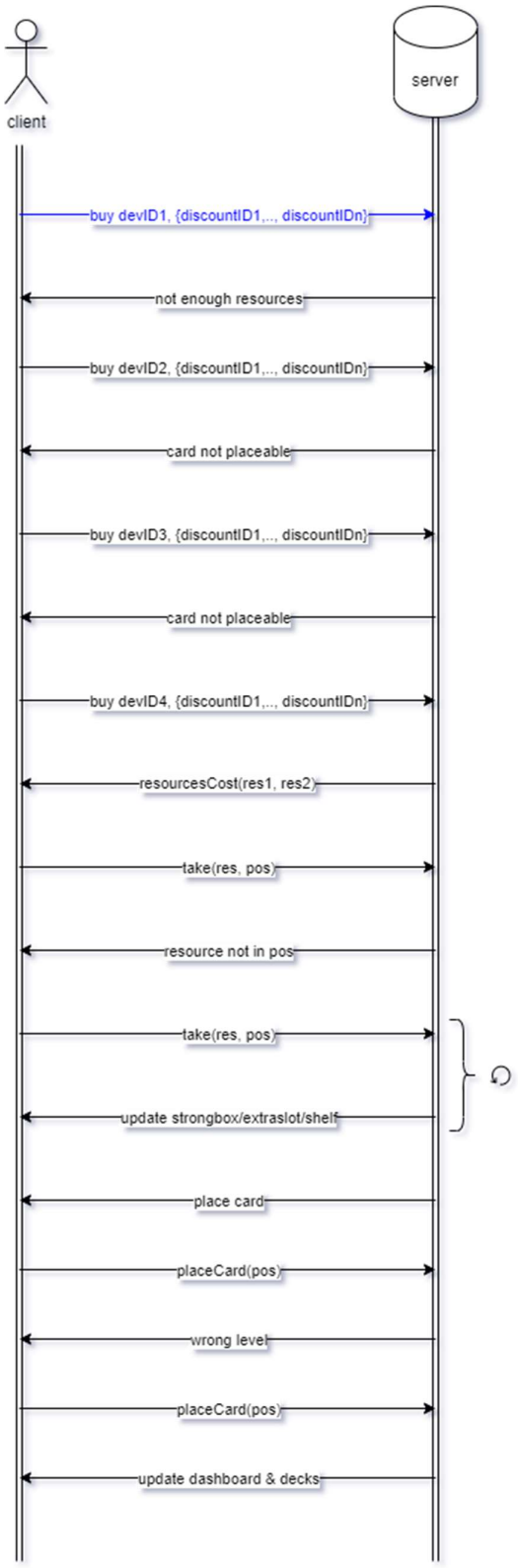
This scenario represents the communication when a client decides to activate a development card production. When the player correctly activates a development card, server will send a list of resources needed to perform the production through the message 'resourceCost'. Now the client will send for each resource (order do not matter) from which place the resource must be taken, through the message 'take (resource, position)'.

Values of 'position' can be extra slot, depot or strongbox. For this kind of operation rollback is not allowed. If the resource does not exist in the specified place, server will notify the client with an error 'not such resource', otherwise it will send an update of the modified stock. If resource is not a resource needed, the server will ignore the message and reply with an error message.

The server will accept 'take' messages until the player has selected all the needed resources: after that, if the client sends other resources, server will not consider them and will reply with 'requirements satisfied' error message.

After production activation, if a faith point is produced, it will also send an 'update faith path' message to all the clients that are playing this game. When the player passes or activate/discard a leader card, the player receives a strongbox update with the resources produced during his turn.

Development card purchase

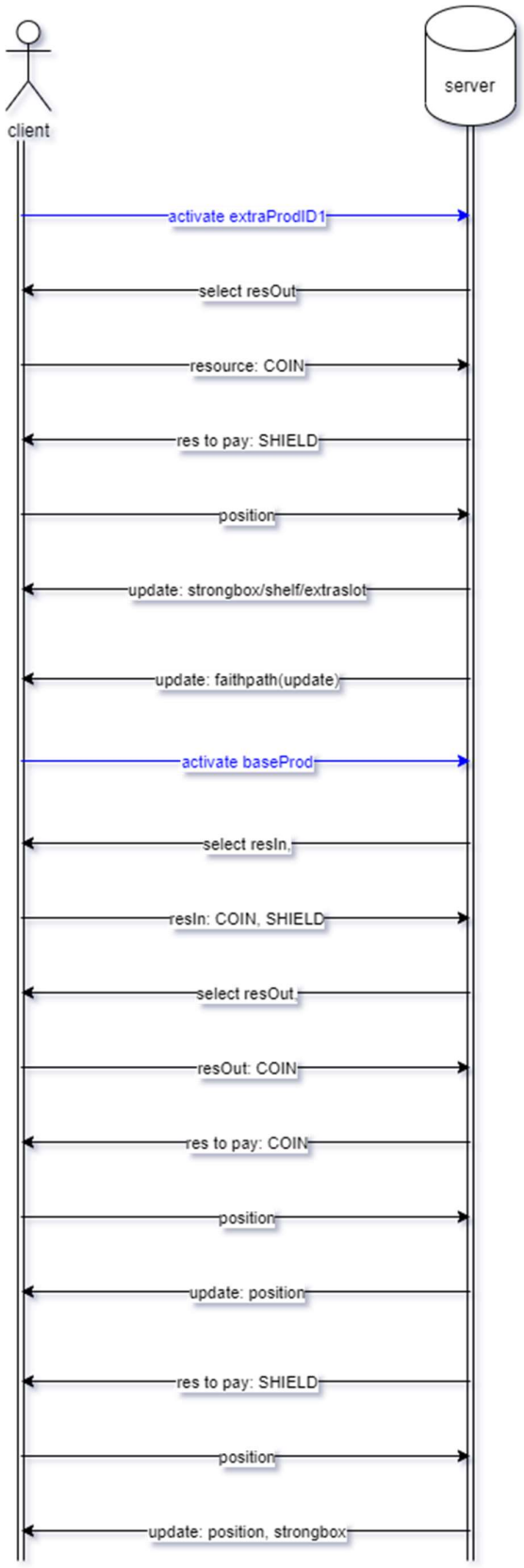


This scenario represents the communication when a client decides to buy development cards.

When a client decides to draw a development card, can choose to send some of the discounts he collected through leader cards activation. If the purchase, considering all the discounts, cannot be afforded by the client, server will send a 'not enough resources' error message. If the card cannot be placed due to its level, the server will send a 'card not placeable' error message. The protocol payment is the same as the one used for the activation of a development card.

Once the client has sent the last resource to pay, he will receive an update message and a 'place card' message from the server. This message indicates that the payment has finished, and the client must choose where to place the card. The 'placeCard(position)' sends an integer parameter between 1 and 3: if the integer is correct, but the card cannot be placed due to its level, the server will send a 'wrong level' message whereas if the parameter differs from the three integers it will send a 'position unexpected' error message and it will wait for a correct message. When the message is correct, all the clients will receive an 'update decks' message to modify the grid of the development cards that can be bought and an update referring to the new card owned by the current player.

Extra and Base Production

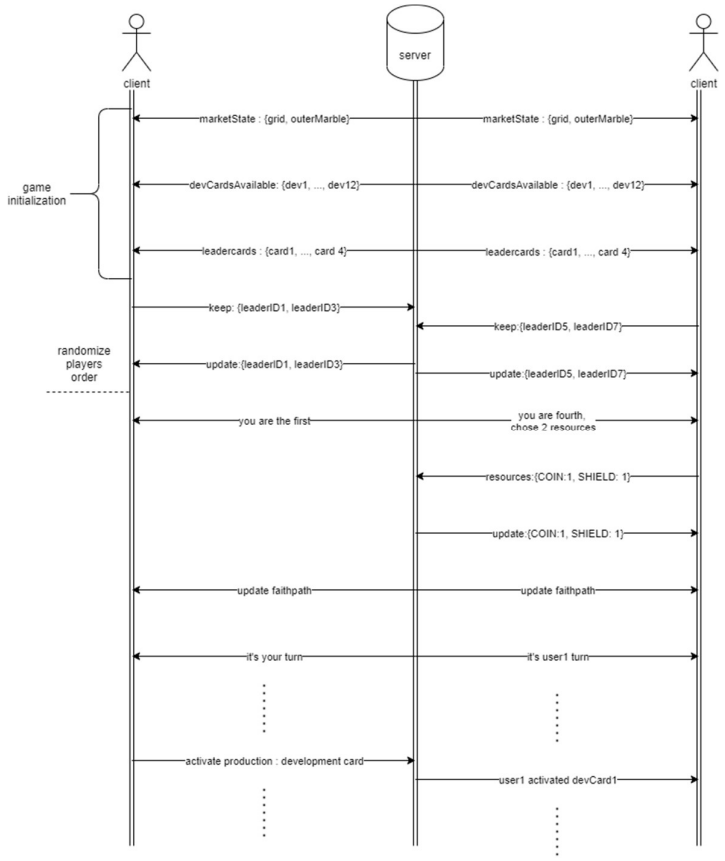


This section is about the activation of an Extra Production or a Base Production during the production phase of a turn.

Extra Production: an error will occur if the player does not own the Resource required for paying the production, in this scenario the server will abort the action and let the player choose another type of production or move on to the next turn phase. Whether no errors occur during the action selection, server is going to ask client the Resource he wants to earn from this production and then where to take the Resource to pay.

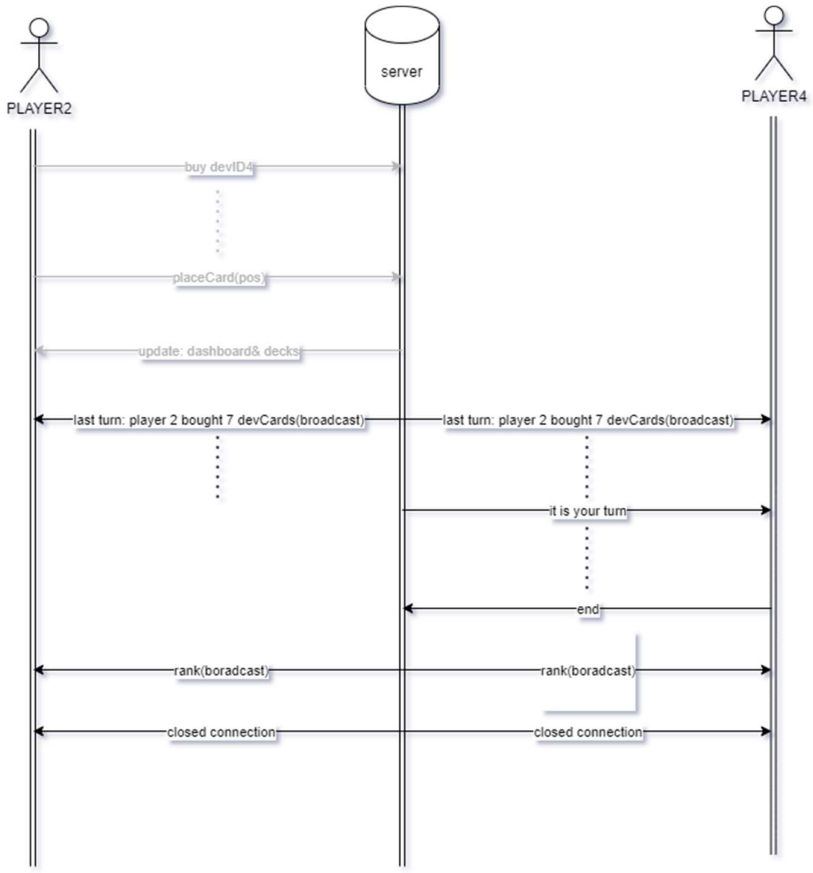
Base Production: an error will occur if the player does not own at least two Resources in the Warehouse Depot, Extra slots and Strongbox combined, in this scenario the server will abort the action and let the player choose another type of production or move on to the next turn phase. Furthermore, it can be activated only once during a turn. Whether no errors occur during the action selection, server is going to ask client which Resources he wants to pay for the production and then the Resource he wants to earn from it. Lastly the client will specify, sending two different messages, where to take Resources to pay.

First turn



After the game set up is ended, the server pushes a message LeaderCards' message containing information about 4 leader cards to each client. Clients reply with 'keep' messages containing the cards the client would like to keep: if the number of cards is different from 2, the server will send an 'invalid number of cards' message.
When a player earns resources, the server will notify all the other clients about this change.

End of the game



When a player buys the 7th Development Card or reaches the last space on the Faith Path, the game is almost ended, the server sends in broadcast a Last Turn message.

When the round ends, server will send to every client the Rank and closes the connection.