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1. Introduction

1.1

1.2 Definitions

Client - any connection to the game server

Player - any client who is in a game

Lobby client - any client who is in the lobby

* players cannot be lobby clients

Hand - A span of game play starting from the swap/deal and ending when the scumbag is assigned (everyone goes out)

Round - A span of game play from a player 'starting' with anything and ending when everyone has passed or someone plays a two.

2. Gameplay

2.1 Rules

The overall goal is to run out of cards before anyone else. If more than one hand (play until everyone runs out of cards) is played, each player gains a social status corresponding with their place in the game.

Three to seven people can play using a standard 52 card deck. Card values are in standard order with Ace high, except the 2 is special and can beat anything. The entire deck is dealt, starting with the Warlord (if determined).

If social status has been set the Warlord goes first, otherwise the player with the 3 of clubs starts with at least that card.

Play goes to the left, or down the social rank, each player having the opportunity to beat the previous play or pass. A play is legal if it at least matches the quantity of cards played last and the face value of cards played last. A play can contain one, two, three, or four matching cards. A player can pass at any time unless it is the start of a new 'round'.

Two's are special, as a single two will beat any play, regardless of it's quantity or face value. Essentially, a two automatically starts a new round. Other players cannot play their own two to beat it and gain control of the next round.

If a play exactly matches the quantity and value of the last play, the next player is skipped (forced to pass).

A round is started every time someone 'starts'. This happens when they don't have a card or set of cards to beat (all players passed except the last player to play or there is a new hand). At the end of each round, the 'last play' or 'discard pile' is cleared, and the next player can play any card or set of cards. The next player to play is the last one to play (after everyone passes).

As players use all their cards, they gain a social rank. The first to go out is the Warlord and the last is the Scumbag. During the next hand, the players switch seats so the Warlord goes first, through the Scumbag last. Before the hand starts, the Warlord swaps one card with the Scumbag. The Scumbag is forced to give their highest card to the Warlord, and the Warlord chooses a card to send back to the Scumbag.

2.2 Lobby interaction

Clients who connect to the game server first must send a "cjoin" message with their name. Once they've received a "sjoin" message from the server they will be placed in the lobby and all clients are updated with a "slobb" message. Any client, in the lobby or playing, can send chat messages to the server, which are broadcast to all clients (including the client who sent it originally).

If a game is not in progress, once the minimum amount of players for a game (default three) are in the lobby, a timeout (default 15) is started. At the end of the timeout (assuming the lobby still has enough clients) lobby members are

moved to a game (they are now players) and the game is started.

After each game, if there are new clients in the lobby they are moved into the game in order of when they joined up to the maximum amount of players (seven). They are assigned social status as moved (the last player moved from the lobby to the game is the Scumbag). If the number of players reaches the minimum the next hand is dealt and gameplay starts.

2.3 Gameplay

At the start of a game, if social status is set, all players except the Scumbag receive a hand message with their hand. The warlord receives a wapw message with the card they receive from the scumbag. They must then send a swap message with the card they are giving to the scumbag. They then receive a hand message reflecting the swap and the Scumbag receives their hand and a waps message indicating the cards they lost and gained.

If the social status was not set, everyone receives hand messages.

At the start of the game and after every play, the server sends a tabl message to each client.

If a player who the server is waiting for a play disconnects suddenly a new table message is sent out with the next player marked as active.

If a player sees that they are active (it's their turn), they should send a play message with their play.

If a player is skipped, one tabl message is sent. Their skip is implied based on their now passed status.

Once all but one player have gone out, the game is over and a new timeout starts, after which a new game will start.

2.4 Strikes

Any time a client does something illegal, the server can strike them with a strik message. After three strikes, the client will be disconnected from the server.

3. Messages

3.1 message syntax

[= message opening delimiter

| = major field delimiter

: = minor field delimiter

, = list delimiter

] = message closing delimiter

A message has the following format.

[<sender><type>|<body>]

```
<sender> = s    // if from the server
          c    // if from the client
```

```
<type> = lobb
        tabl
        join
        hand
        trik
        chat
        play
        waps
        wapw
        swap
```

<body> is dependent upon <type>

length = 8 + <body> length.

3.2 server messages

if <sender><type> = slobb

Sent when a player joins the lobby, leaves the lobby, or gets moved into or out of the lobby. If the server is moving multiple people into and out of lobby/table, it will send one message after moving everyone, not one for each client.

```
<body> = <num_clients>|<name_list>
```

```
<num_clients> = the number of clients in the lobby, two characters
                from 00 to 35.
```

```
<name_list> = <name>[,<name>[, ...]]
```

```
<name> = 8 character name, with spaces as padding after
```

```
length = 3 + (<num_clients> * 9) - 1 = 2 + (<num_clients> * 9)
max length = 35 * 9 + 2 = 317
```

if <sender><type> = stabl

Sent every turn.

```
<body> = <player_list>|<last_play>|<starting_round>
```


<card> = a two digit character designating the card with 52 meaning no card

length = 8 + (3 * 18) - 1 = 61

if <sender><type> = **strik**

Sent if a client sends an illegal message.

<body> = <strike_code>|<num_strikes>

<strike_code> Can be one of the following

- 00 - Unknown error
- 10 - Illegal play (sends **shand** after)
 - 11 - Cards sent do not have matching face values
 - 12 - Face value Giveof cards sent is too low
 - 13 - Quantity of cards sent is too low
 - 14 - Card not in player's hand
 - 15 - Out of turn play
 - 16 - Initial play of first hand must have 3 of clubs
 - 17 - Played duplicates of cards
 - 18 - Pass on start:
- 20 - Timeout (Client hasn't responded for play)
- 30 - Bad message - Invalid message from client to server (wrong format, unknown type, etc)
 - 31 - Lobby player sending play message
 - 32 - Length exceeded (Message length > max_message_length from client)
 - 33 - Unknown message type
 - 34 - Malformed message with known type
- 60 - Chat flood (client is flooding chat messages) - unsure on whether this will be implemented.
- 70 - Illegal swap value (warlord sends illegal card (card not in their hand) in **cswap**. (sends **shand** after)

71 - Illegal swap message (someone not the warlord sends swap message)

72 - Swap message sent out of turn

80 - Can't connect

81 - Too many people already connected

The first value of each code indicates its major class, the second a minor class. The server can send any strike number they want and the client must deal with it. If you want to send a new strike code, make sure it conforms with the values above (e.g. don't send 84 for someone spamming chat). If the server sends one the client doesn't recognize, the client can safely ignore it.

<num_strikes> = One character integer indicating the number of strikes the player has gotten during their current connection. If three, the player will be kicked after the message is sent.

length = 8 + 4 = 12

if <sender><type> = schat

Sent to all clients from the server after a cchat.

<body> will consist of two fields, <name> and <message>, which are separated by a '|' character.

The <name> field is the 8 character name of the original sender, padded by spaces. The <message> field contains the message which has a length of 63 characters and also padded by spaces.

Overall length of <schat> will be 80 characters with 8 of the characters coming from the <sender> (s or c), <type>, brackets and major field delimiter, 8 coming from the players <name>, 1 from the major field delimiter, and 63 from the <message>.

if <sender><type> = swapw

Server requests warlord to choose a card to swap with scumbag.

<body> will consist of a two digit card number indicating which card they are receiving from the scumbag (should be their highest card)

length = 8 + 2 = 10

if <sender><type> = swaps

Server tells the scumbag what card they are getting from the warlord.

<body> will consist of two fields, <card1> and <card2>, which are separated by a '|' character.

<card1> will be represented by a two digit card number indicating which card the scumbag is receiving from the warlord.

<card2> is represented the same way as <card1>, except <card2> indicates the card the warlord is receiving from the scumbag, i.e. the card the scumbag lost.

$\text{length} = 8 + 2 + 1 + 2 = 13$

1.3 client messages

if <sender><type> = cjoin

A message from a client joining, requesting a name.

<body> = 8 character requested name, padded by spaces.

If requested name invalid, the name mangling algorithm should handle it and send them one that is valid.

$\text{length} = 8 + 8 = 16$

if <sender><type> = cchat

A message from a client sending a chat message to all other clients.

<body> = 63 character message, padded by spaces.

$\text{length} = 63 + 8 = 71$

if <sender><type> = cplay

A client sending their play to the server. Validation will come with the next stabl message.

<body> = <card>,<card>,<card>,<card>

<card> = a two digit character designating the card with 52 meaning no card. All cards = 52 means a pass.

$\text{length} = 11 + 8 = 19$

if <sender><type> = chand

A message from a client requesting their hand be sent.

<body> = null

example: [chand]

length = 7

if <sender><type> = cswap

The warlord is sending his card to the server to exchange with the scumbag.

<body> = <card>

<card> = a two digit character designating the card the warlord is giving the scumbag.

length = 10

Maximum message length from server is 325 characters ([slobb](#)).

Maximum message length from client is 71 characters ([cchat](#)).

4. Card Codes

Canonical numbering system

		3	4	5	6	7	8	9	10	J	Q	K	A	2
-----+-----														
♣		00	04	08	12	16	20	24	28	32	36	40	44	48
♦		01	05	09	13	17	21	25	29	33	37	41	45	49
♥		02	06	10	14	18	22	26	30	34	38	42	46	50
♠		03	07	11	15	19	23	27	31	35	39	43	47	51

52 = no card

5. Names

5.1 Name Constraints

Names must follow C variable conventions. Names are made up of letters (upper and lower case) and digits. The underscore character ("_") is also permitted. Names must not begin with a digit.

5.2 Name Mangling

The implementation of this can vary for each server, here are some constraints.

1. Has to handle a at least 35 unique names (max clients who can connect).
2. Must change any requested name into a valid name if the requested name isn't valid. (this allows for striking to start)
3. If a name requested is already in use, the algorithm must make it unique, then check the new name.

6. Command line parameters

6.1 Server

- t Timeout (to play or swap), default 15 seconds
- m Minimum number of players, default 3 (minimum 3)
- l Lobby timeout (to start game once minimum is reached), default 15

6.2 Client

- s DNS name or IP address of server, default "localhost"
- p Port number, default 367xx where xx is your textbook number
- n Name requested by client
- m Manual mode active, flag (meaning no parameter is passed after), default False

7. Feedback

Use the commenting feature [ctrl+alt+m]: