Network Working Group

L. Charamond
M. Portefaix
Gustave Eiffel University – IGM

# THE ChatOS PROTOCOL Version 1.0

## Description

This document describe the ChatOs protocol. This protocol allows multiple clients to connect to the servand and communicate using private and global messages. It also allows two clients to establish private connexion without divulging IP informations. All those features use TCP connexions.

## ChatOS Packets

ChatOS can receive 6 types of packets which are the followings :

| Opcode | Operation |
|---|---|
| 1 | Connection request (CR) |
| 2 | Send personnal message (SPM) |
| 3 | Send message to all (SMA) |
| 4 | TCP ask private connexion (TCPAsk) |
| 5 | TCP Accept (TCPAccept) |
| 6 | TCP Abort (TCPAbort) |
| 7 | TCP connect (TCPConnect) |
| 8 | Error code (ERROR) |

The Opcode is the header of each sended packets. Opcode is always a signed byte.

In this document the STRING type represent a string encoded in UTF-8 preceded by their length as a signed short. We are using a short as it can represent a number as big as 32000 which is more than enough to cover a large majority (if not all) of messages.

## Error codes

| Value | Meaning |
|---|---|
| 1 | OK |
| 2 | Pseudo Unavailable |
| 3 | Invalid Pseudonym |
| 4 | Unreachable User |
| 5 | TCP In Protocole |
| 6 | TCP Not In Protocole |

## ChatOS packets description

### Error:

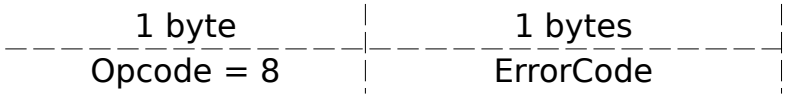


*Figure 1: ERROR packet*

The ERROR packet have the Figure1 format.

### Connexion request

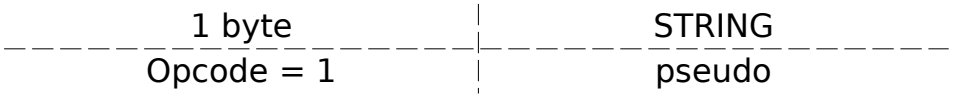


*Figure 2: CR packet*

The CR packet have the Figure2 format. After establishing a TCP connexion with the server, the client need to send this packet to confirm the pseudonym it want to use. If the pseudonym is already used by a connected user, the server will send back an ERROR packet with ErrCode set to ‘Pseudo Unavailable’. If the client already have a pseudonyme, the packet is ignored. Otherwise, the server will send back an ERROR packet with ErrCode set to ‘OK’.

## Send private message

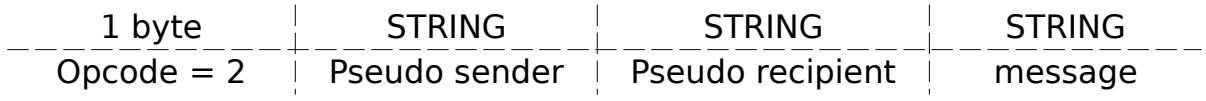


*Figure 3: SPM packet*

The SPM packet have the Figure3 format. For the client to send a private message to another client, it needs to send the SPM packet. This packet must contain the pseudonym of the sender followed by the pseudonym of the recipient and the message. If the pseudonym of the sender is not the one that was assigned to this connexion, the server send an ERROR packet with ErrCode set to 'Invalid Pseudonym'. If the recipient pseudonym is not assigned by the server, it send an ERROR packet with ErrCode set to 'Unreachable User'. Otherwise, the server relay the SPM packet to the recipient and send an ERROR packet with ErrCode set to 'OK' to the sender.

## Send message to all

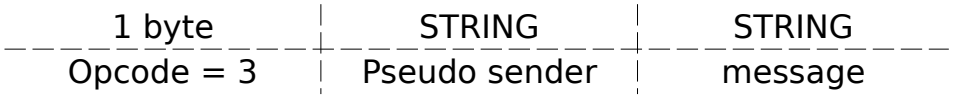


*Figure 4: SMA packet*

The SMA packet have the Figure4 format. For the client to send a message to all connected users, it uses the SMA packet. This packet contains the pseudonym of the sender. If the pseudonym of the sender is not the one that was assigned to this connexion, the server send back an ERROR packet with ErrCode set to 'Invalid Pseudonym'. Otherwise, the server send back an ERROR packet with ErrCode set to 'OK' then relay the packet to all connected users that's not the sender.

## Private connexion protocol

| 1 byte | STRING | STRING | Short |
|---|---|---|---|
| Opcode = 4 | Pseudo sender | Pseudo recipient | Password |

*Figure 5: TCPAsk packet*

For a client A to use the private connexion feature of the server to connect to a client B, it needs to follow the following protocol. First, A send a TCPAsk to the server containing its pseudonym as ‘Pseudo sender’ and the pseudonym of B as the ‘Pseudo recipient’. If the sender’s pseudonym is not the one assigned, the server send back an ERROR packet with ErrCode set to ‘Invalid Pseudonym’ and the protocol terminate. If the pseudonym of the recipient is unkown, the server send back an ERROR packet with ErrCode set to ‘Unreachable User’. If there are already a running protocole the server send back an ERROR packet with ErrCode set to ‘TCP In Protocole`. In those cases the server send a packet TCPAbort too. Otherwise, the packet is relayed to B and the server send an ERROR packet with ErrCode set to ‘OK’.

At this point, B has two choices : it can either accept or deny the connexion.

- If it decide to deny the connection, it needs to send the following packet :

| 1 byte | STRING | STRING | Short |
|---|---|---|---|
| Opcode = 6 | Pseudo sender | Pseudo recipient | Password |

*Figure 6: TCPAbort packet*

If the recipient pseudo is not the same as assigned the server send back an ERROR packet with ErrCode set to ‘Invalid Ps’. If there are no TCP protocol running the server send back an ERROR packet with ErrCode set to ’TCP not in protocol’. Otherwise he relay the TCPAbort packet to the concerned clients.

- If B decide to accept the connexion, B needs to create a new socket for the private connexion, it send the following packet (from the newly created socket) :

| 1 byte | STRING | STRING | Short |
|---|---|---|---|
| Opcode = 5 | Pseudo sender | Pseudo recipient | Password |

*Figure 7: TCPAccept packet*

If there are no TCP protocol running the server send back an ERROR packet with ErrCode set to ’TCP not in protocol’. Otherwise he relay the TCPAccept packet to the concerned clients.

If A receive a packet TCPAbort the protocol is aborted. Otherwise, A create a new socket for the private connexion and send the following packet (from the newly created socket) :

| 1 byte | STRING | STRING | Short |
|---|---|---|---|
| Opcode = 7 | Pseudo sender | Pseudo recipient | Password |

*Figure 8: TCPConnect packet*

If the recipient pseudo is not the same as assigned the server send back an ERROR packet with ErrCode set to ‘Invalid Ps’.If there are no TCP protocol running the server send back an ERROR packet with ErrCode set to ’TCP not in protocol’. The server will send also a TCPAbort. Otherwise he send back an ERROR packet with error code set to ‘OK’.