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Group 10: c2w protocol specification proposal spec-r209-s18-g10

Abstract

The document is a specification for a session protocol capable of supporting the application Chat While Watching(c2w).The protocol is used between clients and server. The goal of this protocol is to allow a client to chat with other users in the main room or movie room.

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1. Introduction

The goal of the c2w protocol specification is to allow clients to chat with other users in the main room or movie room. For the sake of simplicity, the message format is the same for all the messages. This protocol is able to be implemented either with TCP or UDP.

1.1. Functions

When a client logins in to the server, he/she enters the name(or IP address) and the port number of the server as well as his/her user-name in the login window. If the user-name is already used by other client, this client will receive a connection failed message from the server.

If login is successful, this client will be directed to the "main room" and the server sends two messages to this client,one is the list of all users in the system(specifying whether they are available "A"(they are in the main room)or whether they are in a Movie room "M"), the other one is the list of all the available movies. The user can send messages to other users in the main room.

While in the "main room", the user can join one of the movies, the application shows a third window with the list of all the users in this movie room.The user can send messages to other users in the movie room and leave the movie room to go back to the main room.

The user can leave the main room and go back to the login window.

2. Message format

All messages have the same format, shown in figure Figure 1.

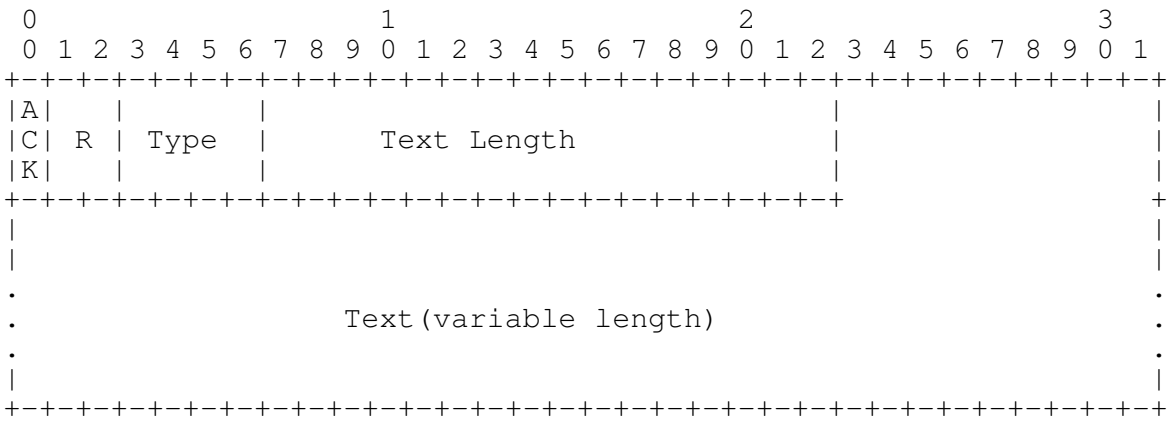


Figure 1

* ACK field(1 bit): This field is set to 1 to acknowledge a previous message， the default value is 0.

* R field (2 bits) : This field indicates the type of corresponding room.

00 : main room

01 : movie room

11 : other case

* Type field (4 bits) : This field indicates the type of each message (refer to a table (definition of the type) for more details).

* Text Length field (16 bits): This field specifies the total length in bytes of the Text. The user must ensure that this field contains the correct value.

* Text field (variable length): This field contains the contente that is the object of the message, encoded in ASCII.

Type	Message Name
0000	Connection To Main Room
0001	Connection Successful
0010	Connection Failed
0011	List of All Users In Main Room
0100	List of All Movies In Main Room
0101	User Sends Message to Server
0110	Server Sends Message to All Users
0111	Enter One Movie Room
1000	List of All Users in Movie Room
1001	Leave the Movie Room
1010	Leave the Main Room
1111	Error

Table 1: Definition of the Type

3. Type of Message

3.1. Connection To Main Room

* Connection To Main Room : When a new client wants to login in to the server, the client sends the request to server.

ACK : 0

R : 11

Type : 0000

Text Length : the total length in bytes of the Text field

Text : this field contains the user-name.

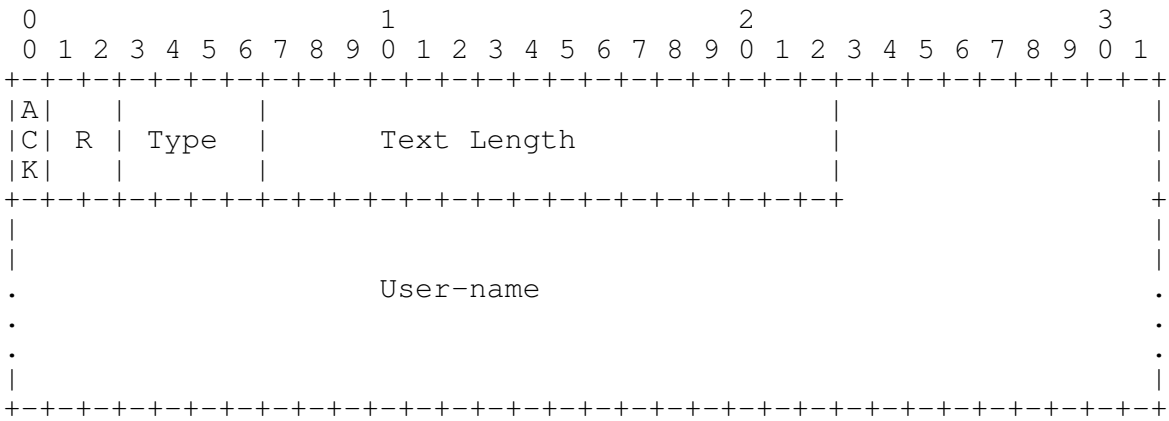


Figure 2

3.2. Connection Successful

* Connection Successful : If the client connects successfully to the main room, the server sends a message to the client.

ACK : 0

R : 11

Type : 0001

Text length : 0

Text : this field is empty.

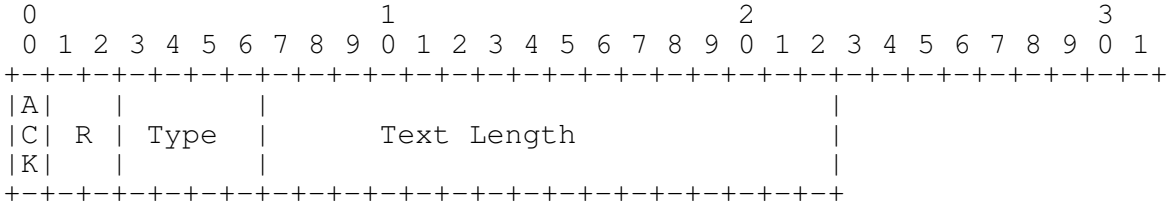


Figure 3

3.3. Connection Failed

* Connection Failed : If the user-name is already used by other users, the client connects unsuccessfully to the main room, the server sends this message to the client.

ACK : 0

R : 11

Type : 0010

Text length : 0

Text : this field is empty.

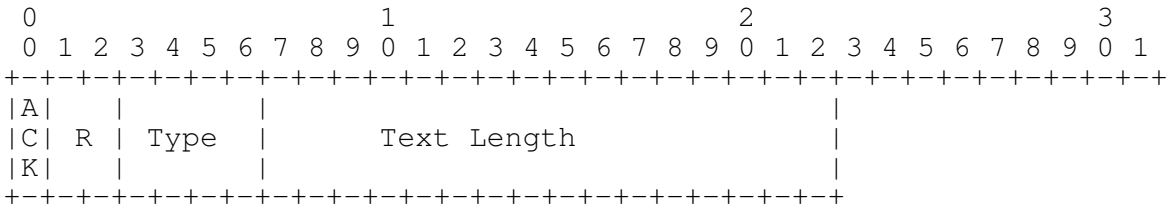


Figure 4

3.4. List of All Users In Main Room

* List of All Users In Main Room : When the client enters the main room, the server sends a message which contains the list of all users in the main room.

ACK : 0

R : 00

Type : 0011

Text length : the total length in bytes of the Text field

Text : this field contains the list of all names of users and their status as well as the number of users.

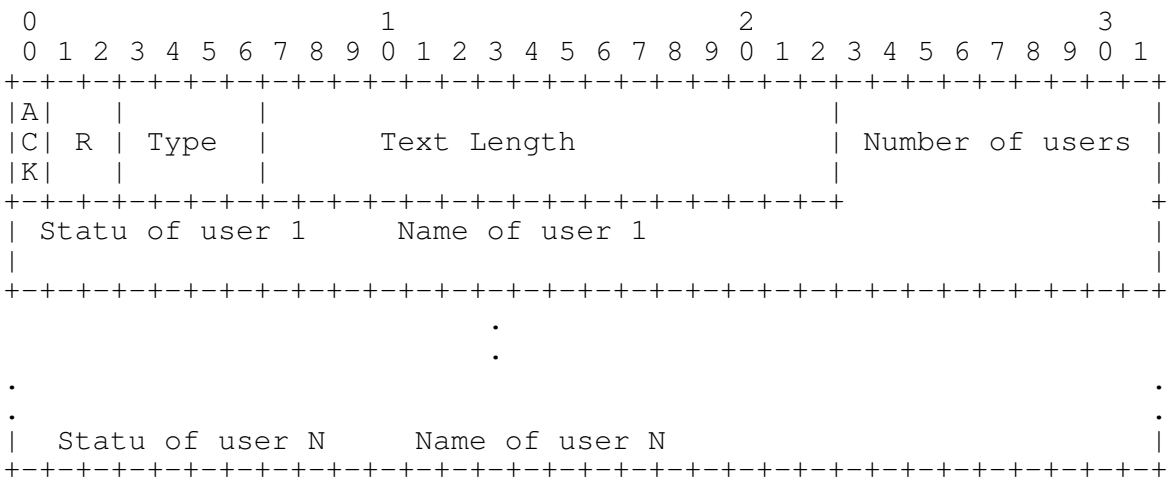


Figure 5

3.5. List of All Movies In Main Room

* List of All Movies In Main Room : When the client enters the main room, the server sends a message which contains the list of all movies in the main room.

ACK : 0

R : 00

Type : 0100

Text length : the total length in bytes of the Text field

Text : this field contains the list of all names of movies and their IP Address as well as the number of movies.

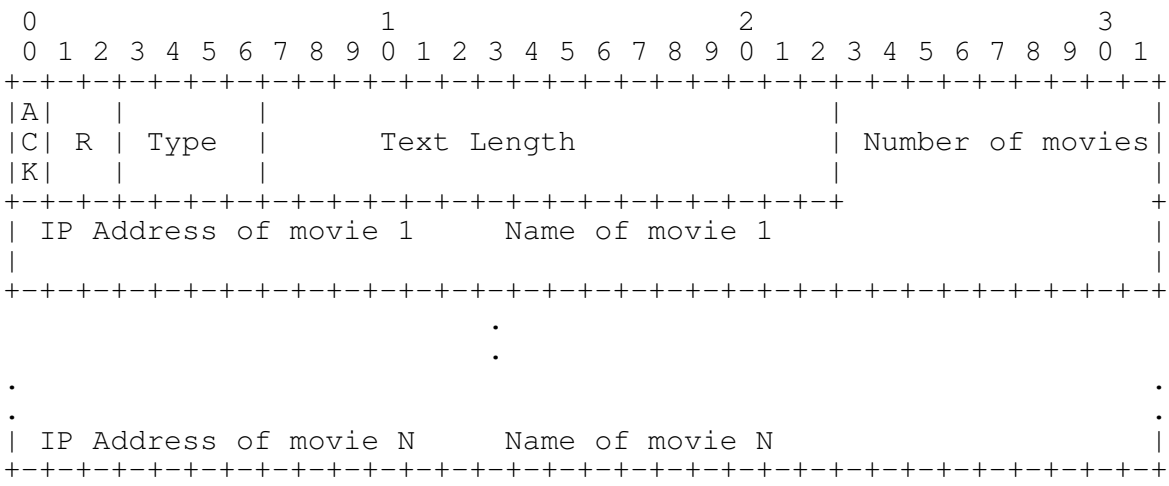


Figure 6

3.6. User Sends Message to Server

* User Sends Message to Server: When the client chats with other users in the main room or movie room, the client sends message to the server.

ACK : 0

R : 00/01

Type : 0101

Text length : the total length in bytes of the Text field

Text : this field contains the content of chatting as well as the user-name.

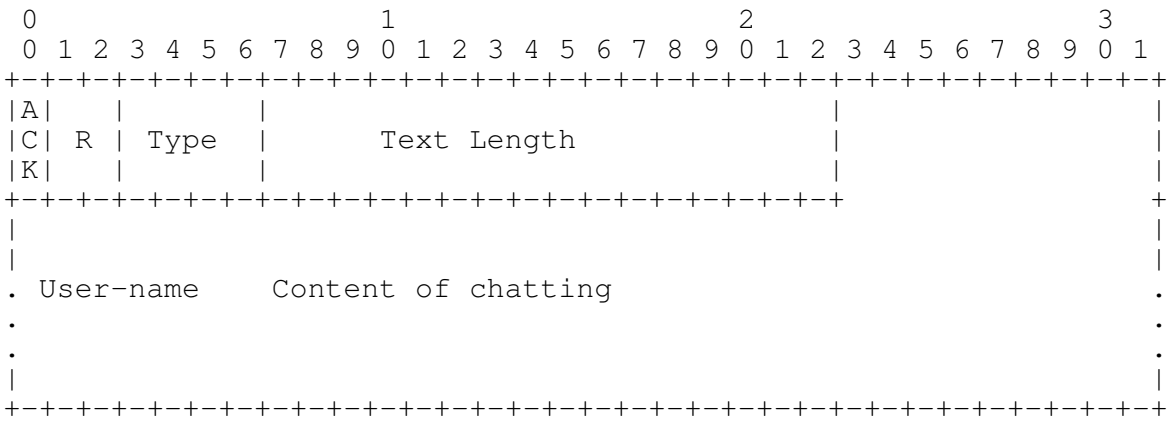


Figure 7

3.7. Server Sends Message to All Users

* Server Sends Message to All Users: Once server receives a message, he will send this message to all the users in certain room.

ACK : 0

R : 00/01

Type : 0110

Text length : the total length in bytes of the Text field

Text : this field contains the content of chatting as well as the user-name.

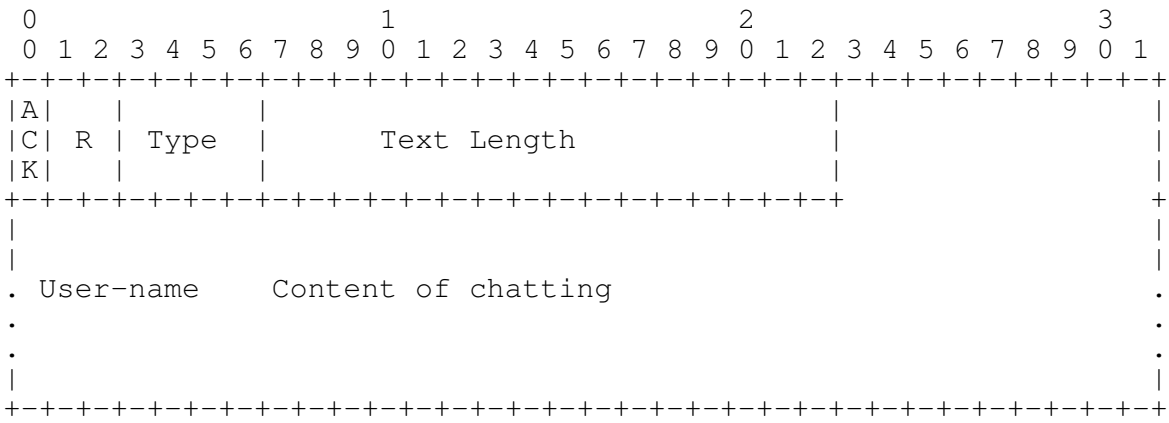


Figure 8

3.8. Enter One Movie Room

* Enter One Movie Room: Set when a client wants to enter one movie room.

ACK : 0

R : 00

Type : 0111

Text length : the total length in bytes of the Text field

Text : this field contains the movie-name.

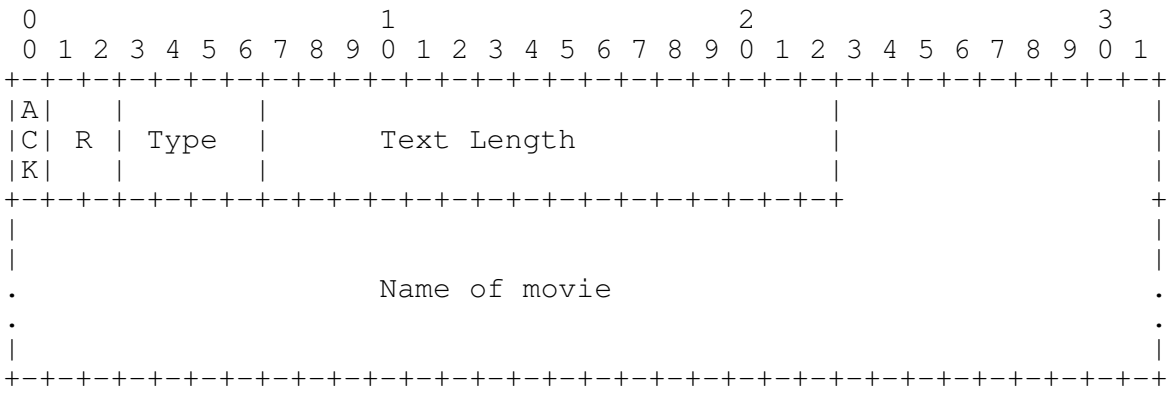


Figure 9

3.9. List of All Users in Movie Room

* List of All Users in Movie Room: When the client enters the room, the server sends a message which contains the list of all users in the main room.

ACK : 0

R : 01

Type : 1000

Text length : the total length in bytes of the Text field

Text : this field contains the list of all names of users as well as the number of users in movie room.

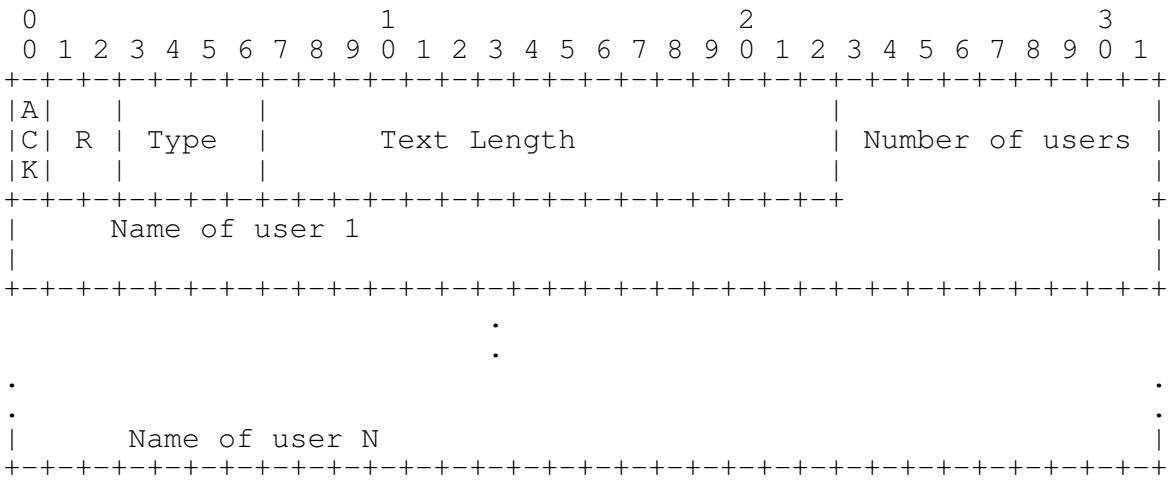


Figure 10

3.10. Leave the Movie Room

* Leave the Movie Room : Indicates that a client wants to leave the movie room and he should be back to main room.

ACK : 0

R : 01

Type : 1001

Text length : 0

Text : this field is empty.

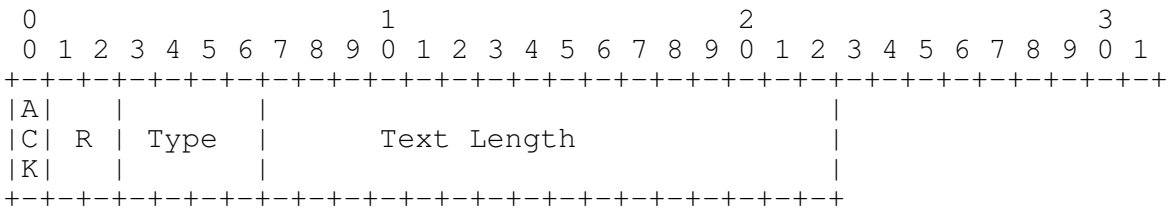


Figure 11

3.11. Leave the Main Room

* Leave the Main Room: Indicates that a client wants to leave the main room and he should be back to login window.

ACK : 0

R : 00

Type : 1010

Text length : 0

Text : this field is empty.

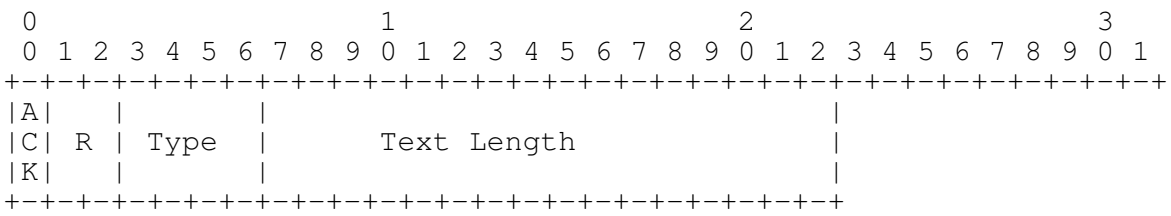


Figure 12

3.12. Error

* Error: Invalide Message means all the other errors.

ACK : 1

R : 11

Type : 1111

Text length : the total length in bytes of the Text field

Text : this field indicates the type of error(refer to a table(Type of error) for more details). The first byte is used to indicate.

Type	Error Name
00000000	Illegal Format of Message
00000001	Main room full
00000010	Movie room full
00000011	Movie list full

Table 2: Type of error

Illegal Format of Message : the length of a message sent by the client must be lower than 300 bytes.

Main room full : The number of users in the main name should be less than 255.

Movie room full : The number of users in the movie name should be less than 255.

Movie list full : The list of movies should be less than 255.

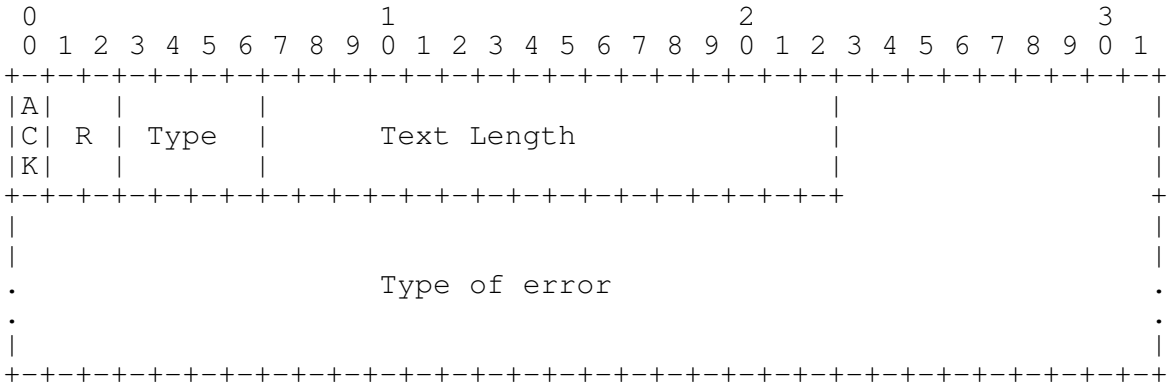


Figure 13

4. Reliability

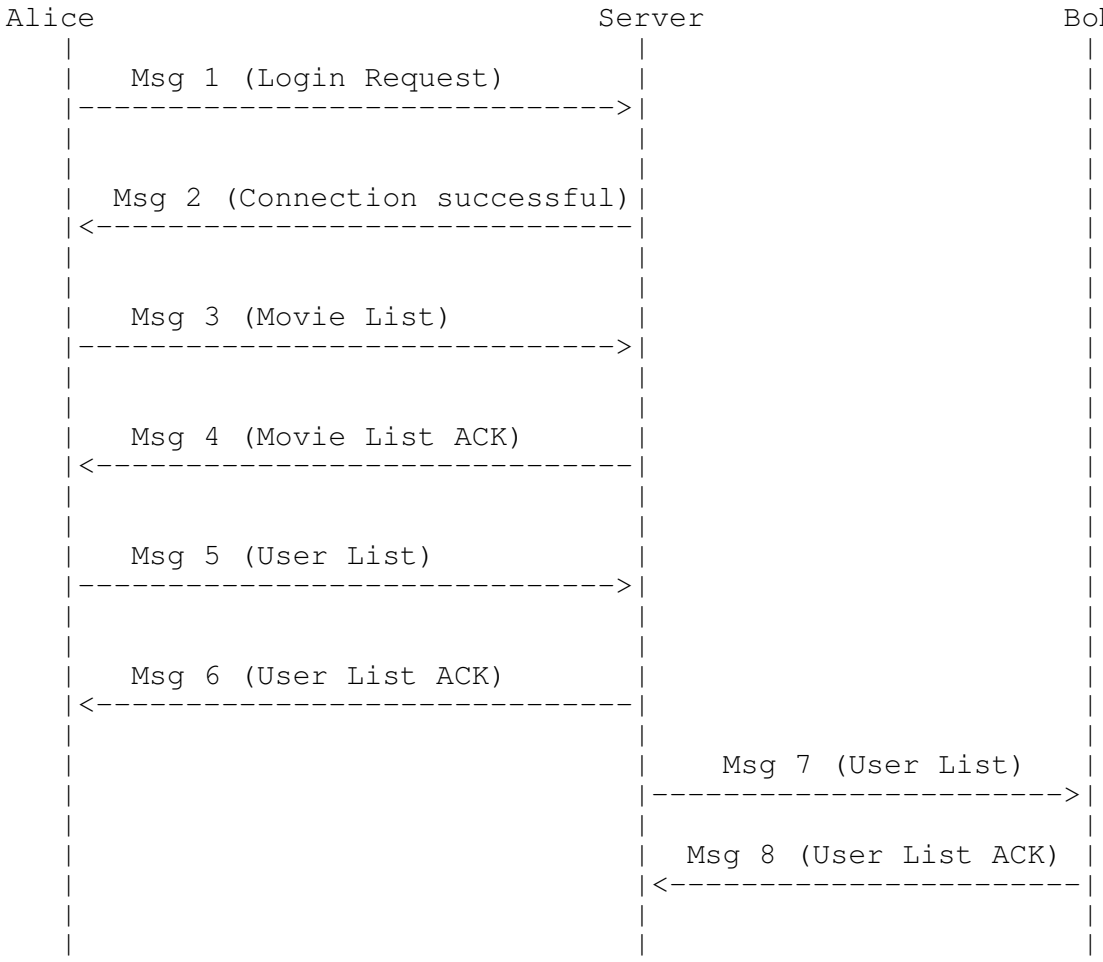
When a client sent a request, but he hasn’t received a ACK reply. In order not to overload servers, clients should wait at least 2 seconds before resending a request.

5. Example scenario

The values of each field are hexadecimal.

5.1. Scenario 1: Login

This first scenario describes the case where a new client 'Alice'. Alice sends a Login Request to the server. Once the server receives that request, he will judge whether the login request is legal, if correct the server will send the ML(movie list) and UL(user list) to Alice, then again the server will send the new UL to other users(i.g. one man called Bob) in the MR(main room).In this case, we assume that it exists just one film called "fiction" in the ML, and the users are Alice and Bob.



Msg 1 (Login Request)

ACK: 0

R: 03

Type: 00

Text Length: 05

Text : 41 6c 69 63 65

Msg 2 (Connection successful)

ACK: 0

R: 03

Type: 01

Text Length: 00

Msg 3 (Movie List)

ACK: 0

R: 00

Type: 04

Text Length: 08

Text : 01 66 69 63 74 69 6f 6e

Msg 4 (Movie List ACK)

ACK: 1

R: 00

Type: 04

Text Length: 00

Msg 5 (User List)

ACK: 0

R: 00

Type: 03

Text Length: 0B

Text : 02 4e 41 6c 69 63 65 4e 42 6f 62

Msg 6 (User List ACK)

ACK: 1

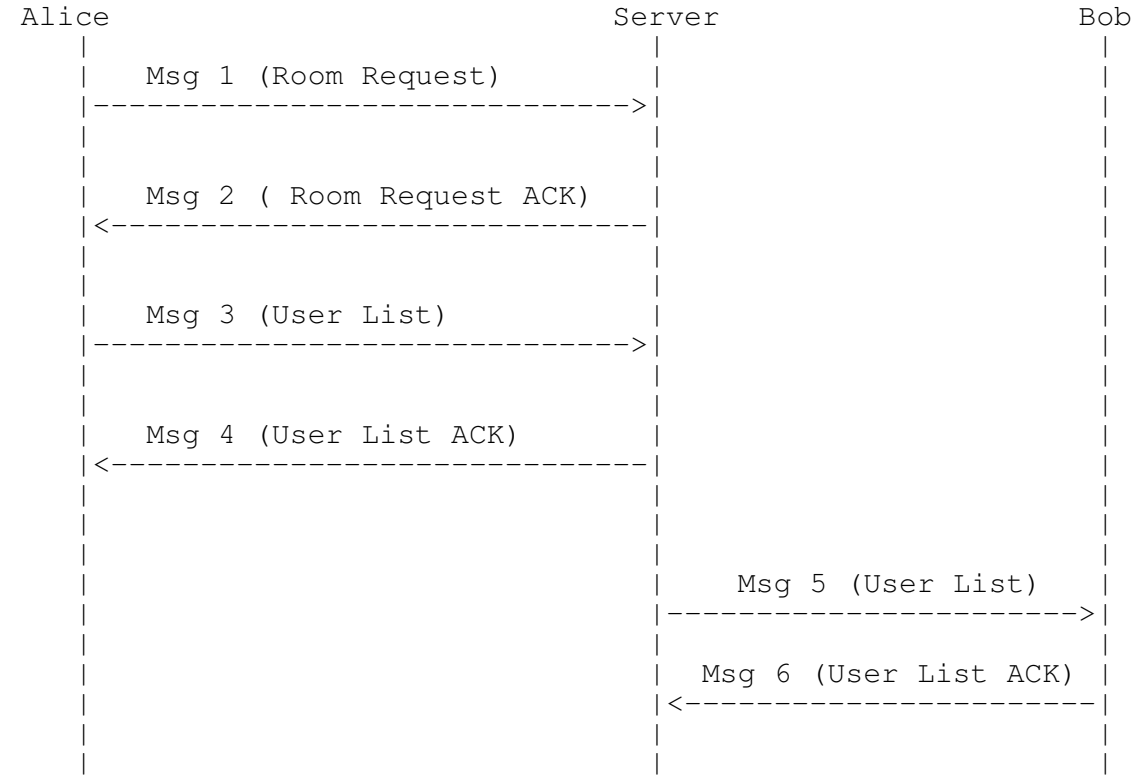
R: 00

Type: 03

Text Length: 00

5.2. Scenario 2: User enters into a Movie Room

Alice decides to enter a Movie Room called "fiction", she will send a room request to the server, then the server responses the room request ACK to her as well as the User List.Then the server will send the newest User List to the users who were already in the Movie Room, for example here Bob.



Msg 1 (Room Request)

ACK: 0

R: 00

Type: 07

Text Length: 07

Text : 66 69 63 74 69 6f 6e

Msg 2 (Room Request ACK)

ACK: 1

R: 00

Type: 07

Text Length: 00

Msg 3 (User List)

ACK: 0

R: 01

Type: 08

Text Length: 09

Text : 02 41 6c 69 63 65 42 6f 62

Msg 4 (User List ACK)

ACK: 1

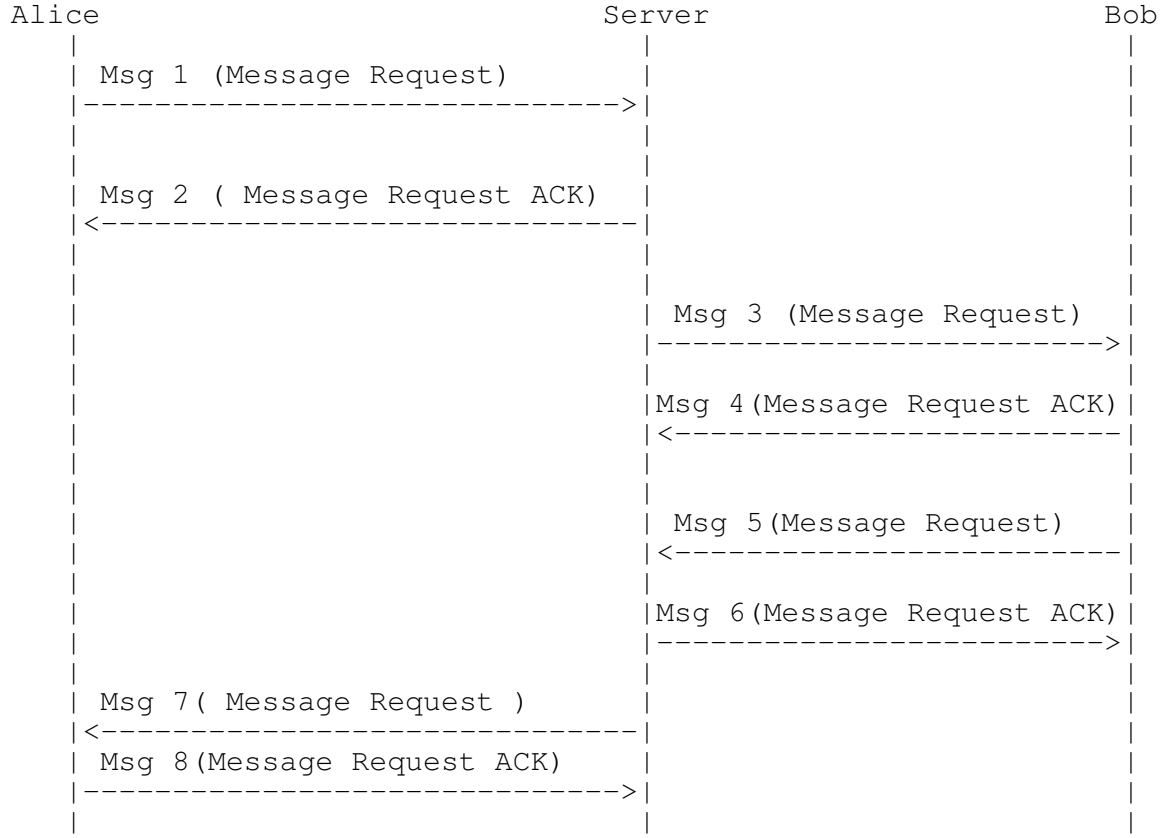
R: 00

Type: 08

Text Length: 00

5.3. Scenario 3: Users chat in the room

We suppose that Alice and Bob were in the same room(for example,they are in Movie Room), and Alice wants to chat with Bob, Alice will send a message to the server,and the server will response a ACK again. Finally, the server will send a message to Bob, and so on Bob will generate a ACK back to server,vice versa.



Msg 1 (Message Request)

ACK: 0

R: 01

Type: 05

Text Length: 0A

Text : 41 6c 69 63 65 48 65 6c 6c 6f

Msg 2 (Message Request ACK)

ACK: 1

R: 01

Type: 05

Text Length: 00

Msg 3 (Message Request)

ACK: 0

R: 01

Type: 06

Text Length: 0A

Text : 41 6c 69 63 65 48 65 6c 6c 6f

Msg 4 (Message Request ACK)

ACK: 1

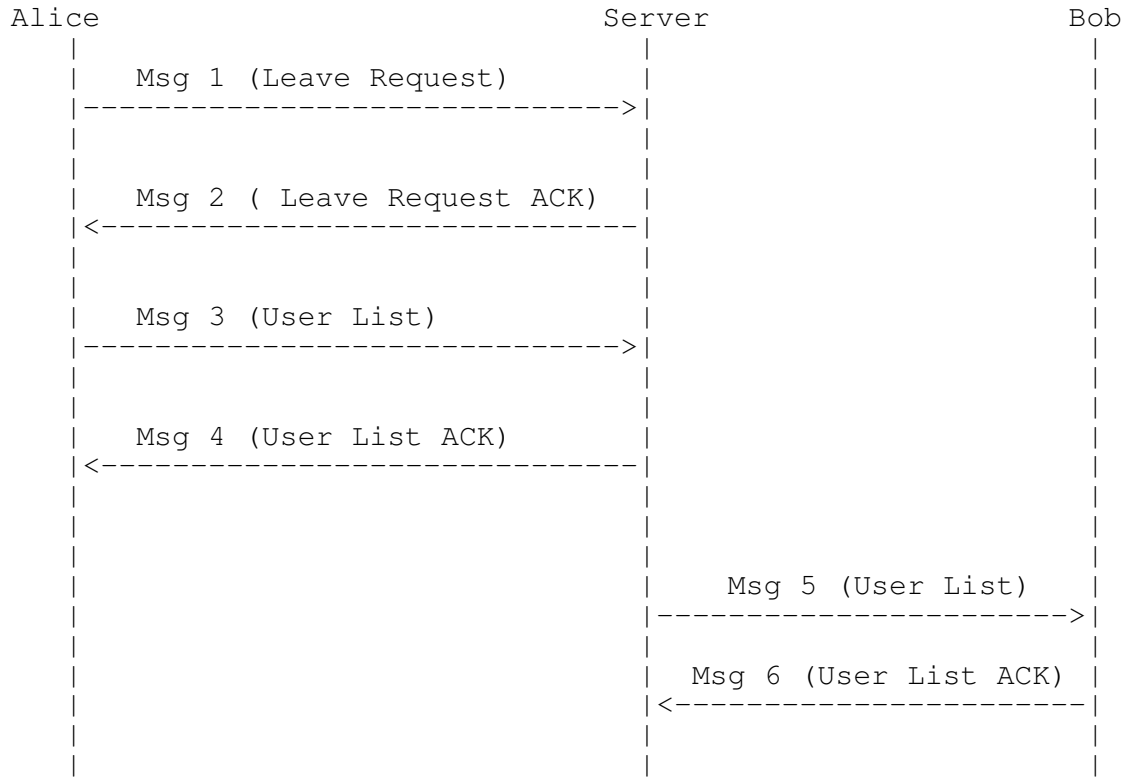
R: 01

Type: 06

Text Length: 00

5.4. Scenario 4: User leaves from a Movie Room

Alice decides to leave the Movie Room, she will send a leave request to the server,then the server responses the leave request ACK to her as well as the User List of Main Room. Then the server will send the newest User List to the users who were already in the Main Room. (we assume that Bob was in the Main Room)



Msg 1 (Leave Request)

ACK: 0

R: 01

Type: 09

Text Length: 00

Msg 2 (Leave Request ACK)

ACK: 1

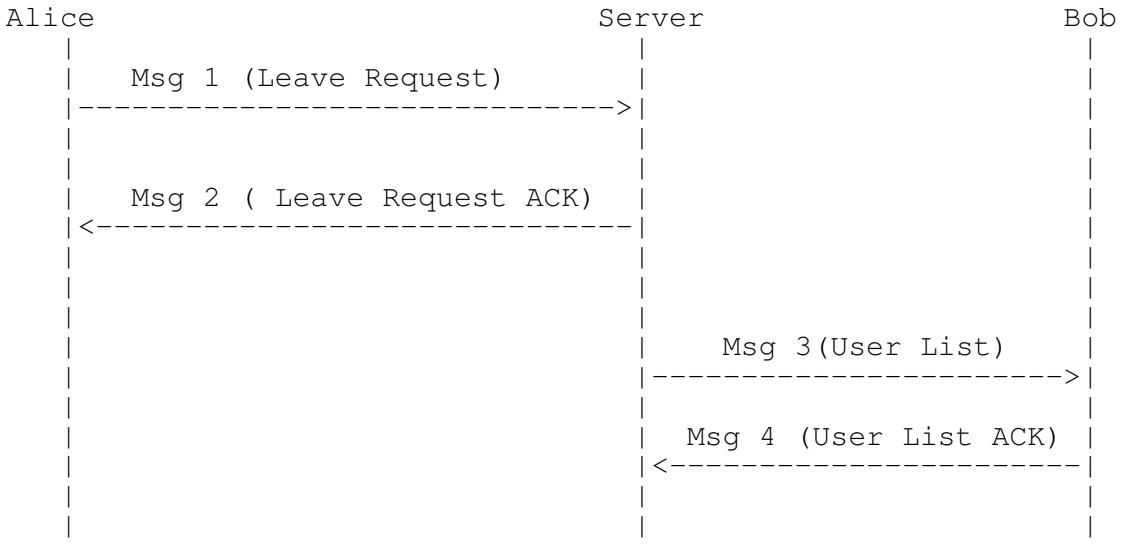
R: 01

Type: 09

Text Length: 00

5.5. Scenario 5: User leaves from a Main Room

Alice decides to leave the Main Room, she will send a leave request to the server, then the server responses the leave request ACK to her.



Msg 1 (Leave Request)

ACK: 0

R: 00

Type: 0A

Text Length: 00

Msg 2 (Leave Request ACK)

ACK: 1

R: 00

Type: 0A

Text Length: 00

6. Conclusion

In conclusion, this specification is to allow clients to chat with other users in the main room or movie room. We use the same message format for transferring. By defining the type of message, we distinguish different functions. Considering the loss of the message, we use ACK to ensure the reception of the message.

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