Distributed Computing Project

Submitted By: Darragh Elbel T00211193

Computing with Software Development

Date Submitted: 07/12/23

Contents

[**Short Message Protocol – SMP** 2](#_Toc160543284)

[Abstract 2](#_Toc160543285)

[1. Introduction 2](#_Toc160543286)

[1.1 Purpose 2](#_Toc160543287)

[1.2 Terminology 2](#_Toc160543288)

[2. Functionality 2](#_Toc160543289)

[2.1 Log-on 2](#_Toc160543290)

[2.2 Short Message Upload 3](#_Toc160543291)

[2.3 Message Download 3](#_Toc160543292)

[2.4 Log-off 3](#_Toc160543293)

[2.5 Protocol-Wide Error Handling 4](#_Toc160543294)

# Introduction

# Short Message Protocol – SMP

## Abstract

The Short Message Protocol (SMP) is a protocol to facilitate the secure saving and retrieval of short messages on a server, accessed via secure log-on based on a set of whitelisted user credentials.

## 1. Introduction

The purpose of SMP is to provide a protocol which allows users to securely save and download messages from a server. SMP consists of 5 core functions, these being logon, the ability for a user to connect to the server using username and password combinations. Logoff, allowing users to disconnect from the server. Message upload, allowing users to upload and save a short message to the server. Specific message download, allowing users to retrieve a specific message. Finally, all message download, allowing users to retrieve all messages at once.

## 2. Functionality

### 2.1 Log-on

System log-on should be facilitated by verifying username and password combinations, transferred to the server for authentication using SSL. Usernames and passwords should be a maximum of 256 bytes each. Only valid ASCII characters should be permitted. The following is an example log-on request in plain text. The maximum size of a LOGON request message is 519 bytes. 5 bytes are allocated to the LOGON prefix, 1 byte allocated to the following space, 256 bytes maximum for the username, 1 byte allocated to the following space, and finally 256 bytes maximum for the password.

LOGON UsernameDemonstration PasswordDemonstration

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **5 Bytes** | **1 Byte** | **256 Bytes** | **1 Byte** | **256 Bytes** |
| LOGON | Blank space (ASCII 255) | Username | Blank space (ASCII 255) | Password |

After the LOGON bytes have been read, the server should recognize that it is a log-on message, if the messages total number of bytes exceeds 519 the message should be discarded without authentication being performed and the response “ERR01 – INVALID MESSAGE FORMAT” should be sent.

#### 2.1.1 Error Table

|  |  |  |
| --- | --- | --- |
| **Code** | **Error Message** | **Description** |
| 01 | ERR01 – INVALID AUTH FORMAT | Returned when a request is detected as being of type LOGON, but the message contains a greater number of bytes (>519) than is permitted. |
| 02 | ERR02 – WRONG USERNAME/PASSWORD | Returned when user authentication fails due to an invalid username/password combination. |

### 2.2 Short Message Upload

Messages upload via SMP are facilitated by the MSGUP command. A message upload packet should not exceed 1024 bytes, 6 of which are reserved for MSGUP and a following space.

|  |  |  |
| --- | --- | --- |
| **5 Bytes** | **1 Byte** | **1018 Bytes** |
| MSGUP | Blank space (ASCII 255) | Message Content |

#### 2.2.1 Error Table

|  |  |  |
| --- | --- | --- |
| **Code** | **Error Message** | **Description** |
| 03 | ERR03 – INVALID MESSAGE FORMAT | Returned when a request is detected as being of type MSGUP, but the request is greater than 1024 bytes in size. |
| 04 | ERR04 – NO MESSAGE | Returned when an MSGUP request does not contain message content. |

### 2.3 All Message Download

Message download is facilitated by the MSGDL command. The MSGDL command is not accompanied by any other arguments and is 5 bytes in length. Downloaded messages should be returned in the format, if multiple message exist they should be concatenated together with a blank space “ “.

“MSG[MESSAGE NUMBER] – [MESSAGE CONTENT]”

For example, “MSG1 – This is my first message”.

|  |
| --- |
| **5 Bytes** |
| MSGDL |

#### 2.3.1 Error Table

|  |  |  |
| --- | --- | --- |
| **Code** | **Error Message** | **Description** |
| 05 | ERR05 – NO MESSAGES STORED | Returned when the logged-in user has no messages saved to the server. |

### 2.4 Specific Message Download

Message download is facilitated by the SPMSG command. The SPMG is accompanied by a specific message id,

“MSG[MESSAGE NUMBER] – [MESSAGE CONTENT]”

For example, “MSG1 – This is my first message”.

|  |  |  |
| --- | --- | --- |
| **5 Bytes** | **1 byte** | **3 bytes** |
| SPMSG | Blank space | 000-100 |

#### 2.4.1 Error Table

|  |  |  |
| --- | --- | --- |
| **Code** | **Error Message** | **Description** |
| 05 | ERR05 – NO MESSAGES WITH PROVIDED ID | Returned when there is no message saved with the provided ID. |

### 2.5 Log-off

System log-off is facilitated through the LGOFF command. The MSGDL command is not accompanied by any other arguments and is 5 bytes is length.

|  |
| --- |
| **5 Bytes** |
| MSGDL |

#### 2.3.1 Error Table

SMP does not have any Log-off specific errors, failure to log-off due to not being signed in is facilitated by protocol-wide error handling.

### 2.6 Protocol-Wide Error Handling

|  |  |  |
| --- | --- | --- |
| **Code** | **Error Message** | **Description** |
| 07 | ERR07 – INVALID COMMAND LENGTH | Returned when the first 6 bytes of a message are not 5 characters of any type plus a blank space. |

# Application Layers

## Presentation Layer

The presentation layer is built using the Java swing library which provides user interface classes such as JTextAreas, JPanels, and JTextFields.

A screenshot of a computer

Description automatically generated A white rectangular object with a black border

Description automatically generated

After login.

A screenshot of a phone

Description automatically generated

# Conclusions