Software Technical Specification

**Messenger**

**Client – Server Application**

**Simple Message Protocol (SMP)**

**Version 1**



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# Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Rev. | Date | Authors | Comments |
| 1 |  |  | 1. Initial release. |
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# Introduction

While the Software Requirements Specification document captures the requirements of the software system, it’s not intended to describe the full technical details of the software system. The role of the Software Technical Specification document is to define in great detail the technical specifications of each of the software requirements. The Software Technical Specification definition process is an iterative process. During each iteration, the team develops a better understanding of the system and the system’s operating environment.

This Software Technical Specification document contains SMP Messenger client and server application technical specifications.

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# Technical Specifications – SMP Server

## Technical Specification 1: *Application Start Feature*

## Associated Requirement

SMP Software Requirements Specification

SMP Server Requirements: 2.1.1 Requirement 1: Application Start Feature

## Specification Details

Implement a GUI Command Button Event Handler that starts the SMP server. The Event Handler should:

* Create a thread of execution to process SMP Client Producer SMP PUT messages and SMP Client Consumer SMP GET messages sent over a TCP/IP network.
* Implement the communications using the Socket API.

## Security Details

TBD

## Technical Specification 2: *Show Messages Feature*

## Associated Requirement

SMP Software Requirements Specification

SMP Server Requirements: 2.1.2 Requirement 2: Show Messages Feature

## Specification Details

Reads SMP message records from the SMP message file and displays the message date, message priority, and message content for each of the messages in the file and outputs the messages. The UI for this feature can be a command-line option in the case of a command-line UI (CLUI), or a clickable button in the case of a graphical user interface (GUI).

## Security Details

Local (inside the network’s firewall) unauthorized accessed to the SMP server that’s hosting the SMP server application allows the unauthorized actor to read SMP messages.

# Technical Specifications – SMP Client Producer

## Technical Specification 1: *Send Message Feature*

## Associated Requirement

SMP Software Requirements Specification

SMP Client Producer Requirements: 2.2.1 Requirement 1: Send Message Feature

## Specification Details

Implement a GUI Command Button Event Handler that sends an SMP PUT message to a SMP server. Implement the communications using the Socket API.

## Security Details

TBD.

## Technical Specification 2: *Put Message Encryption*

## Associated Requirement

SMP Software Requirements Specification

SMP Client Producer Requirements: 2.2.2 Requirement 2: Put Message Encryption

## Specification Details

Using RSA encryption, encrypts the SMP packet’s message field before sending the SMP packet to the SMP Server. RSA encryption asymmetry works with two different keys: a public key and private key. The public key encrypts the data. The private key decrypts the data. Each Client Producer receives the same public key. Each Client Consumer receives the same private key.

## Security Details

Distribution of public and private keys is a security concern. The method used to distribute the public and private keys are to be determined.

## Technical Specification 3: *Name of Technical Specification*

## Associated Requirement

TBD.

## Specification Details

TBD.

## Security Details

TBD.

# Technical Specifications – SMP Client Consumer

## Technical Specification 1: *Get Message Feature*

## Associated Requirement

SMP Software Requirements Specification

SMP Client Consumer Requirements: 2.3.1 Requirement 1: Get Message Feature

## Specification Details

Implement a GUI Command Button Event Handler that sends an SMP GET message to a SMP server. Implement the communications using the Socket API.

## Security Details

TBD.

## Technical Specification 2: *Get Message Decryption*

## Associated Requirement

SMP Software Requirements Specification

SMP Client Consumer Requirements: 2.3.2 Requirement 2: Get Message Decryption

## Specification Details

Using RSA encryption, decrypts the SMP packet’s message field sent from the SMP Server. The RSA encryption algorithm is an asymmetric cryptographic algorithm. RSA encryption asymmetry works with two different keys: a public key and private key. The public key encrypts the data. The private key decrypts the data. Each Client Producer receives the same public key. Each Client Consumer receives the same private key.

## Security Details

Distribution of public and private keys is a security concern. The method used to distribute the public and private keys are to be determined.

## Technical Specification 3: *Name of Technical Specification*

## Associated Requirement

TBD.

## Specification Details

TBD.

## Security Details

TBD.

# Technical Specifications – SMP Library

## Technical Specification 1: *SMP Protocol PUT Packet Format*

## Associated Requirement

SMP Software Requirements Specification

SMP Client Producer Requirements: 2.2.1 Requirement 1: Send Message Feature

## Specification Details

An SMP server processes SMP PUT messages.

The format of an SMP PUT packet is defined as follows:

**Packet Field:** SMP Version

**Packet Field Datatype:** String

**Packet Field Value:** Version\_1\_0

**Packet Field:** Packet Type (PDU (Protocol Data Unit))

**Packet Field Datatype:** String

**Packet Field Value:** PutMessage

**Packet Field:** Message Priority

**Packet Field Datatype:** String

**Packet Field Values:** LOWEST\_PRIORITY, MEDIUM\_PRIORITY, HIGH\_PRIORITY

**Packet Field:** Message Date and Time

**Packet Field Datatype:** String

**Packet Field:** Message Content

**Packet Field Datatype:** String

## Security Details

If the packet is unencrypted, the message content can be read by a network packet analyzer (packet sniffer). It’s recommended that the message content is encrypted. The encryption method is TBD.

## Technical Specification 1: *SMP Protocol GET Packet Format*

## Associated Requirement

SMP Software Requirements Specification

SMP Client Consumer Requirements: 2.3.1 Requirement 1: Get Message Feature

## Specification Details

An SMP server processes SMP GET messages.

The format of an SMP GET packet is defined as follows:

**Packet Field:** SMP Version

**Packet Field Datatype:** String

**Packet Field Value:** Version\_1\_0

**Packet Field:** Packet Type (PDU (Protocol Data Unit))

**Packet Field Datatype:** String

**Packet Field Value:** GetMessage

**Packet Field:** Message Priority

**Packet Field Datatype:** String

**Packet Field Values:** LOWEST\_PRIORITY, MEDIUM\_PRIORITY, HIGH\_PRIORITY

## Security Details

If the packet is unencrypted, the message content can be read by a network packet analyzer (packet sniffer). It’s recommended that the message content is encrypted. The encryption method is TBD.

## Technical Specification 2: *Name of Technical Specification*

## Associated Requirement

TBD.

## Specification Details

TBD.

## Security Details

TBD.

## Technical Specification 2: *Name of Technical Specification*

## Associated Requirement

TBD.

## Specification Details

TBD.

## Security Details

TBD.

# Technical Specifications – SMP Server Data Store

## Technical Specification 1: *Data Store Type*

## Associated Requirement

SMP Software Requirements Specification

SMP Server Requirements: 2.1.1 Requirement 1: Application Start Feature

## Specification Details

The SMP server application stores the SMP messages in an ASCII text file. The datastore is designed to implement the behavior of a message queue. A queue is a first-in, first-out data structure. Messages are sent to the SMP server and inserted into the queue in the order they’re received. The messages are retrieved from the queue in a first-in, first-out fashion. In other words, the first message inserted in the queue is the first message retrieved from the queue.

## Security Details

TBD.

## Sample Unencrypted Message File

Version\_1\_0

1

2/18/2025 4:31:37 PM

LPM1

Version\_1\_0

2

2/18/2025 4:31:49 PM

MPM1

Version\_1\_0

3

2/18/2025 4:31:56 PM

HPM1

## Sample Encrypted Message File

Version\_1\_0

1

2/18/2025 4:37:34 PM

EqVLZrvaWkCp/UhuG9aVe+KHN4IA8rR1Xl3lAMHd7yYlvUrci3PCxKQoE1AScB8IRX/ZFVg0oPuXNcd1wTGrvIqICLg9BHXuz0mEO0z5z7kZAKqoYMCYgwIJ1BOXswZUhBX/tysE4lS09EqFc4K9Ro7gLRA8pSkrdRnWHNJABEtjg9ww2n6yGMEH3EGkUvVTORAP/9X6WXZznq8Zyn7Jw6zqC20D2rq4bIJen6q4j/gT/Pah9NpbdFzH7HYe7vArxhq7UCcHJ8tsfOnXI/P4VQg7UfzY0ub/0lYACG1zNSUwOkvGxsXNccJTdHcGNiIaB3aSG8BBtd8wFRlYGTLzyA==

Version\_1\_0

2

2/18/2025 4:37:42 PM

vosFuZs5c3W5qRcwN/Ucbh/oiVZoYkqR7iqYeXUyMoqQY1ChppyZNPx3vPxHUYzyKZss5UcaznNolG4yd/jcv+pjs98GLfnYLRehPYP1JCNbRaBMiXDhBLXRhGAK/IH4oQu9KwZhHNaOovBU7AubfPOw4a/bRVDC1Kg3QlX62qmZVRTlN4ZRp5HSnWE+95GPXm3WwzO9ZlxTcK7tXzlQyV3xpw5PYg1UtTldKO06MU48Yr5+Jnx2cZM/qriO8gUC6eSJ55GyvzsYOqJVoCcaGlRGEDaCe8r8wZlDYMeZgNrYX9wOXdgqYBWW5WEvHteEIu7W0Wz+RlBi0PcxWlYuog==

Version\_1\_0

3

2/18/2025 4:37:48 PM

AHRczRQPm7ZW+/fUxd3RsHbBkDPPd6VRbAPCkq0h+nc5GKDrRu/vG6FeHLyX2OBxqiqE8b2aP9hpr+UeTS4EUNDFXJJBqb1Qowqc2vGgFAkQekOwxAmLR0vZX3dhB2K41JYvlq0fK718YUad67IYXJe0FPi7qVFEEVLoxGxLYtd5ZUVex6e6vDiQM2GXGYuBTTTOkjMlbpDYb5dYyd94MpFUozgv776WBgnQD+lQG47eg0YZpmozHNI+JYfYd1Fl9OsV/TVVuh0fK4OSdClAytYEc3h4mZkeguKmCrdrQuYGrNZvbTKSwJSmIvWBK+GTAdWPUglpvQYzIUjrqPL+BA==

## Technical Specification 2: *Name of Technical Specification*

## Associated Requirement

TBD.

## Specification Details

TBD.

## Security Details

TBD.

# Technical Considerations

Describes the issues that need to be addressed before implementing a software solution.

## Dependencies

Describe any dependencies.

## Assumptions

Describe any assumptions that may be wrong.

## General Constraints

Describe any constraints that could have an impact on the implementation of the software.

## Guidelines

Describe any guidelines for the implementation of the software.

## Development Methods

Describe the software development method that will be used.

# Software Configuration

# Software Build Instructions

## Build Tools

## Compiler Command Line

## Linker Command Line

# Program Execution

## Command-Line Arguments

Project→ Properties → Run/Debug Settings → (Select Project) → Edit → Arguments

# Package Installer

TBD

# Access and Security

## Server Access

# Appendix

## Acronyms

* + GCC – GNU Compiler Collection

## Engineering Terms

### Embedded Processing

Some terms related to embedded processing

# Notes

# Schedule

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Hours | Team Member | Comments |
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