



Technical Guide 2.8.00

Public Health Information Network Messaging System (PHINMS)

Version 2.8.00

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U.S. Department of Health & Human Services**

May 2, 2008

EXECUTIVE SUMMARY

Public health involves many organizations throughout the PHIN (Public Health Information Network), working together to protect and advance the public's health. These organizations need to use the Internet to securely exchange sensitive data between varieties of different public health information systems. The exchange of data, also known as "Messaging" is enabled through messages created using special file formats and a standard vocabulary. The exchange uses a common approach to security and encryption, methods for dealing with a variety of firewalls, and Internet protection schemes. The system provides a standard way for addressing and routing content, a standard and consistent way for information systems to confirm an exchange.

The Centers for Disease Control and Prevention (CDC) PHINMS (Public Health Information Network Messaging System) is the software which makes this work. The system securely sends and receives sensitive data over the Internet to the public health information systems.

The Technical Reference Guide provides advanced instructions for configuring the PHINMS 2.8.00 application.



REVISION HISTORY

VERSION #	IMPLEMENTER	DATE	EXPLANATION
2.8.00	Wendy Fama	04/23/08	Create 2.8.00 Technical Guide.
2.8.00	Lawrence Loftley	05/02/08	Reviewed 2.8.00 Technical Guide

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ACRONYM LIST

API	Application Programming Interface
BA	Basic Authentication
CA	Certificate Authority
CDC	Centers for Disease Control and Prevention
CPA	Collaboration Protocol Agreement
CSE	Communications Security Establishment
DNS	Domain Name System
ebMS	Electronic Business Extensible Markup Language Messaging Service
ebXML	Electronic Business Extensible Markup Language
EJB	Enterprise JavaBeans
ErrorQ	Error Queue
FIPS	Federal Information Processing Standard
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol over Secure Socket Layer
IMAP	Internet Message Access Protocol
J2EE	Java 2 Platform Enterprise Edition
J2SE	Java 2 Platform Standard Edition
JDBC	Java Database Connectivity
JDK	Java Development Kit
JVM	Java Virtual Machine
ITL	Information Technology Laboratory
LDAP	Lightweight Directory Access Protocol
NIST	National Institute for Standards and Technology
NVLAP	National Voluntary Laboratory Accreditation Program
PHIN	Public Health Information Network
PHINMS	Public Health Information Network Messaging System
PKCS	Public-Key Cryptography Standards
PKI	Public Key Infrastructure
POP	Post Office Protocol
PSK	Pre-Shared Key

OASIS	Organization for the Advancement of Structured Information Standards
ODBC	Open Database Connectivity
SMTP	Simple Mail Transfer Protocol
SOAP	Simple Object Access Protocol
SQL	Structured Query Language
SSL	Secure Socket Layer
SSO	Single Sign-On
STP	Secure Transport Protocol
TCP/IP	Transport Control Protocol Internet Protocol
TLS	Transport Layer Security
TransportQ	Transport Queue
URL	Uniform Resource Locator
WorkerQ	Worker Queue
XML	Extensible Markup Language

1.0 INTRODUCTION

The Centers for Disease Control and Prevention (CDC) Public Health Information Network Messaging System (PHINMS) Technical Reference Guide assists with manually performing outside the graphical user interface configurations. Ensure the most recent versions are referenced from the PHINMS website.

Note: Navigate to www.cdc.gov/phn/phinms when this manual references the PHINMS website.

1.1 Communiqués

The PHINMS team responds to user's communiqués. Send questions, suggestions, and/or comments concerning PHINMS support or documentation to the PHINMS website using the Contact PHINMS email link located at the top of the home page.

2.0 ADVANCED DATABASE INFORMATION

Section 4 explains procedures for creating a database, cache, and tables for the Transport Queue (TransportQ) and Worker Queue (WorkerQ). A database contains tables which store incoming and outgoing messages. The messaging cache is an index of incoming messages.

2.1 TransportQ Database Fields

Table 1 identifies each field in the PHINMS Sender’s TransportQ and whether the field’s value is set by the PHINMS Sender or the application placing the message into the TransportQ.

FIELD NAME	DESCRIPTION	SOURCE	OPTION
recordId	Unique ID of the record in the table and the table’s primary key.	Auto Generated	Mandatory
messageId	Application level message identifier.	Application	Optional
payloadFile	File name of the payload file of an outgoing message relative to a local directory such as myinputs.txt.	Application	Optional
payloadContent	Used only when the payloadFile field is not specified. Populates the contents of a file within the table.	Application	Optional
destinationFilename	The name of the payload file when it is stored on the Receiver/handler.	Application	Optional
routeInfo	Points to the routemap table which points to the message route. Maps to a CPA, a configuration file which maps to the uniform resource locator (URL) of the Message Receiver.	Application	Mandatory
service	ebXML service name.	Application	Mandatory
action	ebXML action.	Application	Mandatory
arguments	Arguments specified by the Message Sender.	Application	Optional
messageCreationTime	Time when record was created, in UTC format.	Sender	Optional
messageRecipient	Recipient’s ID specified by the Sender in the TransportQ_out.	Sender	Optional
processingStatus	Initial value of the status of record created queued.	Sender	Optional
applicationStatus	Status of the application.	Sender	Optional
encryption	The value is Yes if payload is encrypted and No if it is not.	Application	Mandatory
signature	If Yes, XML signature is applied to the payload.	Application	Mandatory
publicKeyLdapAddress	LDAP address of the LDAP directory server.	Application	Optional
publicKeyLdapBaseDN	LDAP Base Distinguished Name of the public key such as o=.	Application	Optional
publicKeyLdapDN	LDAP Distinguished Name of the public key such as cn=.	Application	Optional
certificateURL	URL of a recipient’s public key certificate.	Application	Optional
transportStatus	Transport level status.	Sender	Optional
transportErrorCode	Error code describing the transport failure.	Sender	Optional
applicationErrorCode	The error code returned by the service/action in a synchronous manner.	Sender	Optional
applicationResponse	The synchronous response returned by the service/action.	Sender	Optional
messageSentTime	Time when the message was sent, in UTC format.	Sender	Optional
messageReceivedTime	Time when the message was received, in UTC	Sender	Optional

FIELD NAME	DESCRIPTION	SOURCE	OPTION
	format.		
responseMessageId	Message ID of the response message in the rout-not-read scenario.	Sender	Optional
responseArguments	Used in the Route-not-Read scenario to convey arguments being sent by a Message Sender to a receiving client.	Sender	Optional
responseLocalFile	The response to a poll type request which may contain a payload file in the Route-not-Read scenario	Sender	Optional
responseFilename	The response file name in the Route-not-Read scenario.	Sender	Optional
responseContent	Used when the sender.xml configuration file in the Message Sender specifies the response payload should be written into a database field instead of to a disk.	Sender	Optional
responseMessageOrigin	The PartyID of the party originating the message in the Route-not-Read scenario.	Sender	Optional
responseMessageSignature	The PartyID of the party signing the message in the Route-not-Read scenario.	Sender	Optional
priority	An integer indicating the request's priority.	Application	Optional

Table 1. TransportQ Database Fields

2.2 WorkerQ Database Fields

Table 2 identifies each field in the PHINMS Receiver's WorkerQ and whether the field's value was set by the PHINMS Sender or set by the PHINMS Receiver.

FIELD NAME	DESCRIPTION	SOURCE	OPTION
recordId	Unique ID of the record in the table and the table's primary key.	Receiver	Mandatory
messageId	Application level message identifier.	Sender	Optional
payloadName	File name of the payload, specified by the Message Sender.	Sender	Optional
payloadBinaryContent	Image field written to by the Receiver servlet.	Sender *	Optional
payloadTextContent	Text field populated if textPayload=true in the servicemap entry.	Sender *	Optional
localFilename	File written to disk instead of a database when payloadToDisk =true.	Receiver	Mandatory
service	ebXML service name.	Sender	Mandatory
action	ebXML action.	Sender	Mandatory
arguments	Arguments specified by the Message Sender.	Sender	Optional
fromPartyId	PartyID of the Message Sender.	Sender	Optional
messageRecipient	Recipient's ID specified by the Sender in the TransportQ_out.	Sender	Optional
errorCode	Error code.	Receiver	Optional
errorMessage	Error message.	Receiver	Optional
processingStatus	Initial value of the status of record created queued.	Receiver	Optional
applicationStatus	Status of the application.	Receiver	Optional
encryption	The value is Yes if payload stored in worker Q is encrypted and No if it is not.	Receiver	Mandatory

FIELD NAME	DESCRIPTION	SOURCE	OPTION
receivedTime	Time when payload was received, in UTC format.	Receiver	Optional
lastUpdateTime	Time when record was last updated, in UTC format.	Receiver	Optional
processId	Identifies the process processing the record.	Receiver	Optional

Table 2. WorkerQ Database Fields

* The two fields identified are mutually exclusive. The payload coming from the Sender is placed into one of the two fields by the Receiver depending on the receiver’s configuration value for the textPayload = true/false field.

2.3 Create MSSQL Database

The scripts for creating MSSQL and/or Oracle databases are located in Appendix A.

2.4 Create MSSQL Tables

Appendix A contains various scripts for creating tables used with MSSQL and/or Oracle.

2.5 Transport Codes

A transport status code is sent back to the TransportQ when a message is delivered or processed. If an error occurs during the delivery of a message an error code is sent back to the TransportQ. Table 3 describes the transport status codes and Table 4 describes the transport error codes.

TRANSPORT STATUS CODE	DESCRIPTION
Success	Message send or receive operation succeeded.
Failure	Message send or receive operation failed.

Table 3. Transport Status Codes

TRANSPORT ERROR CODE	DESCRIPTION
SecurityFailure	Error logging into Message Receiver.
DeliveryFailure	Failed to deliver message.
NotSupported	Format of the ebXML message or CPA is unsupported.
Unknown	Not a standard ebXML error.
NoSuchService*	Service/Action failed to map a service on the Message Receiver.
ChecksumFailure*	File checksum verification failure at the Message Receiver.

Table 4. Transport Error Codes

Note: The asterisk (*) symbol indicates a custom error code meaning the code is not in the ebXML specifications.

3.0 FILE SYSTEM-BASED TRANSPORT QUEUES

File System-Based TransportQ is a folder-based option used to send and receive messages. This option is used as a substitute for database sending and receiving configurations.

3.1 XML File Descriptor

An example XML File Descriptor is shown below.

```
<fileDescriptor>
<recordId>22</recordId>
<payloadFile>D:\phinms\shared\outgoing\test.txt</payloadFile>
<payloadContent></payloadContent>
<destinationFilename>test.txt</destinationFilename>
<routeInfo>CDCStaging</routeInfo>
<service>Router</service>
<action>send</action>
<arguments>XXDOHelr</arguments>
<messageRecipient>XXDOH</messageRecipient>
<messageCreationTime>time</messageCreationTime>
<encryption>yes</encryption>
<signature>yes</signature>
<publicKeyLdapAddress>directory.verisign.com:389</publicKeyLdapAddress>
<publicKeyLdapBaseDN>o=Centers for Disease Control and Prevention
</publicKeyLdapBaseDN>
<publicKeyLdapDN>cn=cdc phinms</publicKeyLdapDN>
<acknowledgementFile>D:\phinms\shared\acknowledgments\ack_send.xml
</acknowledgementFile>
</fileDescriptor>
```

3.2 XML File Descriptor Response

An example XML File Descriptor response is shown below.

```
<acknowledgement>
<transportStatus>success</transportStatus>
<transportError>none</transportError>
<applicationStatus>retrieveSucceeded</applicationStatus>
<applicationError>none</applicationError>
<applicationData>targetTable=payroll</applicationData>
<responseLocalFile>1018387200432</responseLocalFile>
<responseFileName>test.txt</responseFileName>
<responseSignature>unsigned</responseSignature>
<responseMessageOrigin>Poller's_PartyID</responseMessageOrigin>
</acknowledgement>
```

3.3 File-Based TransportQ

When the TransportQ is implemented as a file system directory, the file descriptors may be name-value pairs or XML standard files. The fields used in the file system directory have the same name and semantics as the ones used in the relational Database table.

3.4 Name-Value Based File Descriptor

An example name-value based file-descriptor is shown below.

```
recordId=22  
payloadFile=d:\\phinms\\outgoing\\test.txt  
destinationFilename=test.txt  
routeInfo=CDCStaging  
service=Router  
action=send  
arguments=XXDOHelr  
messageRecipient=XXDOH
```

3.5 Sending File Response

An example of a response (written to the acknowledgement file specified in the outgoing file descriptor) from a file send operation is shown below.

```
transportStatus=success  
transportError=none  
applicationStatus=retrieveSucceeded  
applicationError=none  
applicationData=TargetTable=payroll  
responseLocalFile=1018379449158  
responseFileName=test.txt  
responseSignature=unsigned  
responseMessageOrigin=Poller's_PartyID
```

4.0 JDBC DRIVER SYNTAX INFORMATION

4.1 SQL

4.1.1 SQL 2000

JDBC Driver ----- `com.microsoft.jdbc.sqlserver.SQLServerDriver`

Database URL PreFix ----- `jdbc:microsoft:sqlserver:`

Database URL Suffix ----- `//(Computer Name):(Port);DatabaseName=(Name of Database)`

4.1.2 SQL 2005

JDBC Driver ----- `com.microsoft.sqlserver.jdbc.SQLServerDriver`

Database URL PreFix ----- `jdbc:sqlserver:`

Database URL Suffix ----- `//(Computer Name):(Port);DatabaseName=(Name of Database);encrypt=true;trustServerCertificate=true`

4.2 HSQL

JDBC Drive: `org.hsqldb.jdbcDriver`

Database URL PreFix: `jdbc:hsqldb:hsql:`

Database URL Suffix: `//(Computer Name):(Port)/(Name of Database)`

4.3 MS Access

JDBC Driver: `sun.jdbc.odbc.JdbcOdbcDriver`

Database URL PreFix: `jdbc:odbc:`

Database URL Suffix: `PhinmsgAccessDSN270`

4.4 MySQL

JDBC Driver: `com.mysql.jdbc.Driver`

Database URL PreFix: `jdbc:mysql:`

Database URL Suffix: `//(Computer Name):(Port)/(Name of Database)`

4.5 Oracle

JDBC Driver: `oracle.jdbc.driver.OracleDriver`



Database URL PreFix: jdbc:oracle:thin:

Database URL Suffix: @(Computer Name):(Port):(Name of Database)

Note: Remove the parathenses “()” from the URL Suffix when the **Computer Name**, **Port**, and **Name of Database** are inserted. Ensure all the other characters are not removed.

5.0 ADVANCED CONSOLE INFORMATION

5.1 Transport Status and Error Codes

The following Tables show status and error codes which may be written to the message queues based on the outcome of the message delivery or processing. Applications which use the PHINMS system can read these codes and act on them.

STATUS	DESCRIPTION
Success	Message Send/Receive operation successful.
Failure	Message Send/Receive operation failure.

Table 5. Status Codes

ERRORCODE	DESCRIPTION
SecurityFailure	Error logging into Message Receiver.
DeliveryFailure	Failed to deliver message.
NotSupported	Format of ebXML message or CPA unsupported.
Unknown	Not a standard ebXML error.
NoSuchService (*)	Service/Action did not map to a service on the Message Receiver.
ChecksumFailure (*)	File checksum verification failure at the Message Receiver.

Table 6. Error Codes

Note: (*) Custom error codes not in ebXML specification.

6.0 TABLE SCRIPTS

The table scripts identified in the following sections are examples for a database administrator to use to create tables for Senders and Receivers. The PHINMS account permissions needed to create tables are as follows:

- read,
- write,
- insert, and
- update.

6.1 MSSQL Scripts

Section A.1 lists the scripts used to create MSSQL databases.

6.1.1 TransportQ Table - Sender

```
CREATE TABLE [dbo].[TransportQ_out] (  
    [recordId] [bigint] IDENTITY (1, 1) NOT NULL ,  
    [messageId] [char] (255) NULL ,  
    [payloadFile] [char] (255) NULL ,  
    [payloadContent] [image] NULL ,  
    [destinationFilename] [char] (255) NULL ,  
    [routeInfo] [char] (255) NOT NULL ,  
    [service] [char] (255) NOT NULL ,  
    [action] [char] (255) NOT NULL ,  
    [arguments] [char] (255) NULL ,  
    [messageRecipient] [char] (255) NULL ,  
    [messageCreationTime] [char] (255) NULL ,  
    [encryption] [char] (10) NOT NULL ,  
    [signature] [char] (10) NOT NULL ,  
    [publicKeyLdapAddress] [char] (255) NULL ,  
    [publicKeyLdapBaseDN] [char] (255) NULL ,  
    [publicKeyLdapDN] [char] (255) NULL ,  
    [certificateURL] [char] (255) NULL ,  
    [processingStatus] [char] (255) NULL ,  
    [transportStatus] [char] (255) NULL ,  
    [transportErrorCode] [char] (255) NULL ,  
    [applicationStatus] [char] (255) NULL ,  
    [applicationErrorCode] [char] (255) NULL ,  
    [applicationResponse] [char] (255) NULL ,  
    [messageSentTime] [char] (255) NULL ,  
    [messageReceivedTime] [char] (255) NULL ,  
    [responseMessageId] [char] (255) NULL ,  
    [responseArguments] [char] (255) NULL ,  
    [responseLocalFile] [char] (255) NULL ,  
    [responseFilename] [char] (255) NULL ,  
    [responseContent] [image] NULL ,  
    [responseMessageOrigin] [char] (255) NULL ,  
    [responseMessageSignature] [char] (255) NULL ,  
    [priority] [int] NULL  
) ON [PRIMARY] TEXTIMAGE_ON [PRIMARY]
```

GO

6.1.2 WorkerQ Table - Sender

```
CREATE TABLE [dbo].[message_inq] (  
    [recordId] [bigint] IDENTITY (1, 1) NOT NULL ,  
    [messageId] [varchar] (255) NULL ,  
    [payloadName] [varchar] (255) NULL ,  
    [payloadBinaryContent] [image] NULL ,  
    [payloadTextContent] [text] NULL ,  
    [localFileName] [varchar] (255) NOT NULL ,  
    [service] [varchar] (255) NOT NULL ,  
    [action] [varchar] (255) NOT NULL ,  
    [arguments] [varchar] (255) NULL ,  
    [fromPartyId] [varchar] (255) NULL ,  
    [messageRecipient] [varchar] (255) NULL ,  
    [errorCode] [varchar] (255) NULL ,  
    [errorMessage] [varchar] (255) NULL ,  
    [processingStatus] [varchar] (255) NULL ,  
    [applicationStatus] [varchar] (255) NULL ,  
    [encryption] [varchar] (10) NOT NULL ,  
    [receivedTime] [varchar] (255) NULL ,  
    [lastUpdateTime] [varchar] (255) NULL ,  
    [processId] [varchar] (255) NULL  
) ON [PRIMARY] TEXTIMAGE_ON [PRIMARY]  
GO
```

6.1.3 ErrorQ Table - Sender

```
CREATE TABLE [dbo].[PHINMS_errq] (  
    [recordId] [bigint] IDENTITY (1, 1) NOT NULL ,  
    [messageId] [varchar] (255) NULL ,  
    [payloadName] [varchar] (255) NULL ,  
    [payloadBinaryContent] [image] NULL ,  
    [payloadTextContent] [text] NULL ,  
    [localFileName] [varchar] (255) NOT NULL ,  
    [service] [varchar] (255) NOT NULL ,  
    [action] [varchar] (255) NOT NULL ,  
    [arguments] [varchar] (255) NULL ,  
    [fromPartyId] [varchar] (255) NULL ,  
    [messageRecipient] [varchar] (255) NULL ,  
    [errorCode] [varchar] (255) NULL ,  
    [errorMessage] [varchar] (255) NULL ,  
    [processingStatus] [varchar] (255) NULL ,  
    [applicationStatus] [varchar] (255) NULL ,  
    [encryption] [varchar] (10) NOT NULL ,  
    [receivedTime] [varchar] (255) NULL ,  
    [lastUpdateTime] [varchar] (255) NULL ,  
    [processId] [varchar] (255) NULL  
) ON [PRIMARY] TEXTIMAGE_ON [PRIMARY]  
GO
```

6.1.4 Messaging Cache Table - Sender

```
CREATE TABLE [dbo].[messagingcache] (  
    [sequence] [int] IDENTITY (1, 1) NOT NULL ,  
    [partyId] [char] (50) NULL ,  
    [convId] [char] (50) NULL ,
```

```
        [recordId] [char] (50) NULL ,
        [response] [text] NULL ,
        [timestamp] [char] (20) NULL ,
        [status] [char] (10) NULL
    ) ON [PRIMARY] TEXTIMAGE_ON [PRIMARY]
GO
```

6.1.5 Messaging Queue Table - Receiver

```
CREATE TABLE [dbo].[message_inq] (
    [recordId] [bigint] IDENTITY (1, 1) NOT NULL ,
    [messageId] [varchar] (255) NULL ,
    [payloadName] [varchar] (255) NULL ,
    [payloadBinaryContent] [image] NULL ,
    [payloadTextContent] [text] NULL ,
    [localFileName] [varchar] (255) NOT NULL ,
    [service] [varchar] (255) NOT NULL ,
    [action] [varchar] (255) NOT NULL ,
    [arguments] [varchar] (255) NULL ,
    [fromPartyId] [varchar] (255) NULL ,
    [messageRecipient] [varchar] (255) NULL ,
    [errorCode] [varchar] (255) NULL ,
    [errorMessage] [varchar] (255) NULL ,
    [processingStatus] [varchar] (255) NULL ,
    [applicationStatus] [varchar] (255) NULL ,
    [encryption] [varchar] (10) NOT NULL ,
    [receivedTime] [varchar] (255) NULL ,
    [lastUpdateTime] [varchar] (255) NULL ,
    [processId] [varchar] (255) NULL
) ON [PRIMARY] TEXTIMAGE_ON [PRIMARY]
GO
```

6.1.6 TransportQ Table - Receiver

```
CREATE TABLE [dbo].[message_outq] (
    [recordId] [bigint] IDENTITY (1, 1) NOT NULL ,
    [messageId] [varchar] (255) NULL ,
    [payloadName] [varchar] (255) NULL ,
    [payloadBinaryContent] [image] NULL ,
    [payloadTextContent] [text] NULL ,
    [localFileName] [varchar] (255) NOT NULL ,
    [service] [varchar] (255) NOT NULL ,
    [action] [varchar] (255) NOT NULL ,
    [arguments] [varchar] (255) NULL ,
    [fromPartyId] [varchar] (255) NULL ,
    [messageRecipient] [varchar] (255) NULL ,
    [errorCode] [varchar] (255) NULL ,
    [errorMessage] [varchar] (255) NULL ,
    [processingStatus] [varchar] (255) NULL ,
    [applicationStatus] [varchar] (255) NULL ,
    [encryption] [varchar] (10) NOT NULL ,
    [receivedTime] [varchar] (255) NULL ,
    [lastUpdateTime] [varchar] (255) NULL ,
    [processId] [varchar] (255) NULL
) ON [PRIMARY] TEXTIMAGE_ON [PRIMARY]
GO
```

6.1.7 ErrorQ Table - Receiver

```
CREATE TABLE [dbo].[message_errq] (  
    [recordId] [bigint] IDENTITY (1, 1) NOT NULL ,  
    [messageId] [varchar] (255) NULL ,  
    [payloadName] [varchar] (255) NULL ,  
    [payloadBinaryContent] [image] NULL ,  
    [payloadTextContent] [text] NULL ,  
    [localFileName] [varchar] (255) NOT NULL ,  
    [service] [varchar] (255) NOT NULL ,  
    [action] [varchar] (255) NOT NULL ,  
    [arguments] [varchar] (255) NULL ,  
    [fromPartyId] [varchar] (255) NULL ,  
    [messageRecipient] [varchar] (255) NULL ,  
    [errorCode] [varchar] (255) NULL ,  
    [errorMessage] [varchar] (255) NULL ,  
    [processingStatus] [varchar] (255) NULL ,  
    [applicationStatus] [varchar] (255) NULL ,  
    [encryption] [varchar] (10) NOT NULL ,  
    [receivedTime] [varchar] (255) NULL ,  
    [lastUpdateTime] [varchar] (255) NULL ,  
    [processId] [varchar] (255) NULL  
) ON [PRIMARY] TEXTIMAGE_ON [PRIMARY]  
GO
```

6.2 Oracle Scripts

6.2.1 TransportQ Table - Sender

```
CREATE TABLE TransportQ_out (  
    recordId number(19,0) NOT NULL ,  
    messageId char (255) NULL ,  
    payloadFile char (255) NULL ,  
    payloadContent BLOB NULL ,  
    destinationFilename char (255) NULL ,  
    routeInfo char (255) NOT NULL ,  
    service char (255) NOT NULL ,  
    action char (255) NOT NULL ,  
    arguments char (255) NULL ,  
    messageRecipient char (255) NULL ,  
    messageCreationTime char (255) NULL ,  
    encryption char (10) NOT NULL ,  
    signature char (10) NOT NULL ,  
    publicKeyLdapAddress char (255) NULL ,  
    publicKeyLdapBasedN char (255) NULL ,  
    publicKeyLdapDN char (255) NULL ,  
    certificateURL char (255) NULL ,  
    processingStatus char (255) NULL ,  
    transportStatus char (255) NULL ,  
    transportErrorCode char (255) NULL ,  
    applicationStatus char (255) NULL ,  
    applicationErrorCode char (255) NULL ,  
    applicationResponse char (255) NULL ,  
    messageSentTime char (255) NULL ,  
    messageReceivedTime char (255) NULL ,  
    responseMessageId char (255) NULL ,
```



```
CREATE TRIGGER message_inq_IDENTITY
before insert on message_inq
for each row
begin
select message_inq_record_count.nextval into :new.recordId from dual;
end;
```

6.2.3 ErrorQ Table - Sender

```
CREATE TABLE message_inq (
    recordId number(19,0) NOT NULL ,
    messageId varchar2 (255) NULL ,
    payloadName varchar2 (255) NULL ,
    payloadBinaryContent BLOB NULL ,
    payloadTextContent CLOB NULL ,
    localFileName varchar2 (255) NOT NULL ,
    service varchar2 (255) NOT NULL ,
    action varchar2 (255) NOT NULL ,
    arguments varchar2 (255) NULL ,
    fromPartyId varchar2 (255) NULL ,
    messageRecipient varchar2 (255) NULL ,
    errorCode varchar2 (255) NULL ,
    errorMessage varchar2 (255) NULL ,
    processingStatus varchar2 (255) NULL ,
    applicationStatus varchar2 (255) NULL ,
    encryption varchar2 (10) NOT NULL ,
    receivedTime varchar2 (255) NULL ,
    lastUpdateTime varchar2 (255) NULL ,
    processId varchar2 (255) NULL
) ;
```

```
CREATE SEQUENCE message_inq_recordID
START WITH 1
INCREMENT BY 1;
```

```
CREATE TRIGGER message_inq_IDENTITY
before insert on message_inq
for each row
begin
select message_inq_recordID.nextval into :new.recordId from dual;
end;
/
```

6.2.4 Messaging Cache Table - Sender

```
CREATE TABLE messagingcache (
    sequence number(10,0) NOT NULL ,
    partyId char (50) NULL ,
    convId char (50) NULL ,
    recordId char (50) NULL ,
    response CLOB NULL ,
    timestamp char (20) NULL ,
    status char (10) NULL
) ;
```

```
CREATE SEQUENCE messagingcache_sequence
```

```
START WITH 1  
INCREMENT BY 1;
```

```
CREATE TRIGGER messagingcache_IDENTITY  
before insert on messagingcache  
for each row  
begin  
select messagingcache_sequence.nextval into :new.sequence from dual;  
end;  
/
```

6.2.5 Messaging Queue Table - Receiver

```
CREATE TABLE message_inq (  
    recordId number(19,0) NOT NULL ,  
    messageId varchar2 (255) NULL ,  
    payloadName varchar2 (255) NULL ,  
    payloadBinaryContent BLOB NULL ,  
    payloadTextContent CLOB NULL ,  
    localFileName varchar2 (255) NOT NULL ,  
    service varchar2 (255) NOT NULL ,  
    action varchar2 (255) NOT NULL ,  
    arguments varchar2 (255) NULL ,  
    fromPartyId varchar2 (255) NULL ,  
    messageRecipient varchar2 (255) NULL ,  
    errorCode varchar2 (255) NULL ,  
    errorMessage varchar2 (255) NULL ,  
    processingStatus varchar2 (255) NULL ,  
    applicationStatus varchar2 (255) NULL ,  
    encryption varchar2 (10) NOT NULL ,  
    receivedTime varchar2 (255) NULL ,  
    lastUpdateTime varchar2 (255) NULL ,  
    processId varchar2 (255) NULL  
) ;
```

```
CREATE SEQUENCE message_inq_recordID  
START WITH 1  
INCREMENT BY 1;
```

```
CREATE TRIGGER message_inq_IDENTITY  
before insert on message_inq  
for each row  
begin  
select message_inq_recordID.nextval into :new.recordId from dual;  
end;  
/
```

6.2.6 TransportQ Table - Receiver

```
CREATE TABLE message_outq (  
    recordId number(19,0) NOT NULL ,  
    messageId varchar2 (255) NULL ,  
    payloadName varchar2 (255) NULL ,  
    payloadBinaryContent BLOB NULL ,  
    payloadTextContent CLOB NULL ,  
    localFileName varchar2 (255) NOT NULL ,  
    service varchar2 (255) NOT NULL ,
```



```
    action varchar2 (255) NOT NULL ,
    arguments varchar2 (255) NULL ,
    fromPartyId varchar2 (255) NULL ,
    messageRecipient varchar2 (255) NULL ,
    errorCode varchar2 (255) NULL ,
    errorMessage varchar2 (255) NULL ,
    processingStatus varchar2 (255) NULL ,
    applicationStatus varchar2 (255) NULL ,
    encryption varchar2 (10) NOT NULL ,
    receivedTime varchar2 (255) NULL ,
    lastUpdateTime varchar2 (255) NULL ,
    processId varchar2 (255) NULL
) ;

CREATE SEQUENCE message_outq_recordID
    START WITH 1
    INCREMENT BY 1;

CREATE TRIGGER message_outq_IDENTITY
before insert on message_outq
for each row
begin
select message_outq_recordID.nextval into :new.recordId from dual;
end;
/
```

6.2.7 ErrorQ Table - Receiver

```
CREATE TABLE message_errq (
    recordId number(19,0) NOT NULL ,
    messageId varchar2 (255) NULL ,
    payloadName varchar2 (255) NULL ,
    payloadBinaryContent BLOB NULL ,
    payloadTextContent CLOB NULL ,
    localFileName varchar2 (255) NOT NULL ,
    service varchar2 (255) NOT NULL ,
    action varchar2 (255) NOT NULL ,
    arguments varchar2 (255) NULL ,
    fromPartyId varchar2 (255) NULL ,
    messageRecipient varchar2 (255) NULL ,
    errorCode varchar2 (255) NULL ,
    errorMessage varchar2 (255) NULL ,
    processingStatus varchar2 (255) NULL ,
    applicationStatus varchar2 (255) NULL ,
    encryption varchar2 (10) NOT NULL ,
    receivedTime varchar2 (255) NULL ,
    lastUpdateTime varchar2 (255) NULL ,
    processId varchar2 (255) NULL
) ;

CREATE SEQUENCE message_errq_recordID
    START WITH 1
    INCREMENT BY 1;

CREATE TRIGGER message_errq_IDENTITY
```

```
before insert on message_errq
for each row
begin
select message_errq_recordID.nextval into :new.recordId from dual;
end;
/
```

6.2.8 Route-not-Read Table - Sender

```
CREATE TABLE broadcast (
    name char (100) NULL ,
    addresses char (1000) NULL
);

CREATE TABLE messagebins (
    recordId number(19,0) NOT NULL ,
    messageId varchar2 (255) NULL ,
    payloadName varchar2 (255) NULL ,
    payloadBinaryContent BLOB NULL ,
    payloadTextContent CLOB NULL ,
    localFileName varchar2 (255) NULL ,
    service varchar2 (255) NOT NULL ,
    action varchar2 (255) NOT NULL ,
    arguments varchar2 (255) NULL ,
    fromPartyId varchar2 (255) NULL ,
    messageRecipient varchar2 (255) NULL ,
    errorCode varchar2 (255) NULL ,
    errorMessage varchar2 (255) NULL ,
    processingStatus varchar2 (255) NULL ,
    applicationStatus varchar2 (255) NULL ,
    encryption varchar2 (10) NOT NULL ,
    receivedTime varchar2 (255) NULL ,
    lastUpdateTime varchar2 (255) NULL ,
    processId varchar2 (255) NULL
);

CREATE SEQUENCE messagebins_recordId
    START WITH 1
    INCREMENT BY 1;

CREATE TRIGGER messagebins_IDENTITY
before insert on messagebins
for each row
begin
select messagebins_recordId.nextval into :new.recordId from dual;
end;
/

CREATE TABLE partyid_user (
    partyId char (255) NULL ,
    "user" char (255) NULL ,
    sdnuser char (255) NULL
);

CREATE TABLE users (
    name char (100) NULL ,
```

```
        description char (255) NULL  
);
```

6.3 MySQL Scripts

6.3.1 TransportQ Table - Sender

```
CREATE TABLE TransportQ_out (  
    recordId bigint NOT NULL AUTO_INCREMENT,  
    messageId char (255) NULL ,  
    payloadFile char (255) NULL ,  
    payloadContent LONGBLOB NULL ,  
    destinationFilename char (255) NULL ,  
    routeInfo char (255) NOT NULL ,  
    service char (255) NOT NULL ,  
    action char (255) NOT NULL ,  
    arguments char (255) NULL ,  
    messageRecipient char (255) NULL ,  
    messageCreationTime char (255) NULL ,  
    encryption char (10) NOT NULL ,  
    signature char (10) NOT NULL ,  
    publicKeyLdapAddress char (255) NULL ,  
    publicKeyLdapBaseDN char (255) NULL ,  
    publicKeyLdapDN char (255) NULL ,  
    certificateURL char (255) NULL ,  
    processingStatus char (255) NULL ,  
    transportStatus char (255) NULL ,  
    transportErrorCode char (255) NULL ,  
    applicationStatus char (255) NULL ,  
    applicationErrorCode char (255) NULL ,  
    applicationResponse char (255) NULL ,  
    messageSentTime char (255) NULL ,  
    messageReceivedTime char (255) NULL ,  
    responseMessageId char (255) NULL ,  
    responseArguments char (255) NULL ,  
    responseLocalFile char (255) NULL ,  
    responseFilename char (255) NULL ,  
    responseContent LONGBLOB NULL ,  
    responseMessageOrigin char (255) NULL ,  
    responseMessageSignature char (255) NULL ,  
    priority int NULL,  
    PRIMARY KEY (recordId)  
);
```

6.3.2 WorkerQ Table - Sender

```
CREATE TABLE message_inq (  
    recordId bigint NOT NULL AUTO_INCREMENT,  
    messageId varchar (255) NULL ,  
    payloadName varchar (255) NULL ,  
    payloadBinaryContent LONGBLOB NULL ,  
    payloadTextContent LONGTEXT NULL ,  
    localFileName varchar (255) NOT NULL ,  
    service varchar (255) NOT NULL ,  
    action varchar (255) NOT NULL ,  
    arguments varchar (255) NULL ,  
    fromPartyId varchar (255) NULL ,
```

```
messageRecipient varchar (255) NULL ,
errorCode varchar (255) NULL ,
errorMessage varchar (255) NULL ,
processingStatus varchar (255) NULL ,
applicationStatus varchar (255) NULL ,
encryption varchar (10) NOT NULL ,
receivedTime varchar (255) NULL ,
lastUpdateTime varchar (255) NULL ,
processId varchar (255) NULL,
PRIMARY KEY (recordId)
);
```

6.3.3 ErrorQ Table - Sender

```
CREATE TABLE PHINMS_errq (
recordId bigint NOT NULL AUTO_INCREMENT,
messageId varchar (255) NULL ,
payloadName varchar (255) NULL ,
payloadBinaryContent LONGBLOB NULL ,
payloadTextContent LONGTEXT NULL ,
localFileName varchar (255) NOT NULL ,
service varchar (255) NOT NULL ,
action varchar (255) NOT NULL ,
arguments varchar (255) NULL ,
fromPartyId varchar (255) NULL ,
messageRecipient varchar (255) NULL ,
errorCode varchar (255) NULL ,
errorMessage varchar (255) NULL ,
processingStatus varchar (255) NULL ,
applicationStatus varchar (255) NULL ,
encryption varchar (10) NOT NULL ,
receivedTime varchar (255) NULL ,
lastUpdateTime varchar (255) NULL ,
processId varchar (255) NULL,
PRIMARY KEY (recordId)
);
```

6.3.4 Messaging Cache Table - Sender

```
CREATE TABLE messagingcache (
sequence int NOT NULL AUTO_INCREMENT,
partyId char (50) NULL ,
convId char (50) NULL ,
recordId char (50) NULL ,
response LONGTEXT NULL ,
timestamp char (20) NULL ,
status char (10) NULL,
PRIMARY KEY (sequence)
);
```

6.3.5 Messaging Queue Table - Receiver

```
CREATE TABLE message_outq (
recordId bigint NOT NULL AUTO_INCREMENT,
messageId varchar (255) NULL ,
payloadName varchar (255) NULL ,
payloadBinaryContent LONGBLOB NULL ,
payloadTextContent LONGTEXT NULL ,
```

```
localFileName varchar (255) NOT NULL ,
service varchar (255) NOT NULL ,
action varchar (255) NOT NULL ,
arguments varchar (255) NULL ,
fromPartyId varchar (255) NULL ,
messageRecipient varchar (255) NULL ,
errorCode varchar (255) NULL ,
errorMessage varchar (255) NULL ,
processingStatus varchar (255) NULL ,
applicationStatus varchar (255) NULL ,
encryption varchar (10) NOT NULL ,
receivedTime varchar (255) NULL ,
lastUpdateTime varchar (255) NULL ,
processId varchar (255) NULL,
PRIMARY KEY (recordId)
);
```

6.3.6 TransportQ - Receiver

```
CREATE TABLE message_outq (
  recordId bigint NOT NULL AUTO_INCREMENT,
  messageId varchar (255) NULL ,
  payloadName varchar (255) NULL ,
  payloadBinaryContent LONGBLOB NULL ,
  payloadTextContent LONGTEXT NULL ,
  localFileName varchar (255) NOT NULL ,
  service varchar (255) NOT NULL ,
  action varchar (255) NOT NULL ,
  arguments varchar (255) NULL ,
  fromPartyId varchar (255) NULL ,
  messageRecipient varchar (255) NULL ,
  errorCode varchar (255) NULL ,
  errorMessage varchar (255) NULL ,
  processingStatus varchar (255) NULL ,
  applicationStatus varchar (255) NULL ,
  encryption varchar (10) NOT NULL ,
  receivedTime varchar (255) NULL ,
  lastUpdateTime varchar (255) NULL ,
  processId varchar (255) NULL,
  PRIMARY KEY (recordId)
);
```

6.3.7 Message ErrorQ - Receiver

```
CREATE TABLE message_errq (
  recordId bigint NOT NULL AUTO_INCREMENT,
  messageId varchar (255) NULL ,
  payloadName varchar (255) NULL ,
  payloadBinaryContent LONGBLOB NULL ,
  payloadTextContent LONGTEXT NULL ,
  localFileName varchar (255) NOT NULL ,
  service varchar (255) NOT NULL ,
  action varchar (255) NOT NULL ,
  arguments varchar (255) NULL ,
  fromPartyId varchar (255) NULL ,
  messageRecipient varchar (255) NULL ,
  errorCode varchar (255) NULL ,
```

```
    errorMessage varchar (255) NULL ,
    processingStatus varchar (255) NULL ,
    applicationStatus varchar (255) NULL ,
    encryption varchar (10) NOT NULL ,
    receivedTime varchar (255) NULL ,
    lastUpdateTime varchar (255) NULL ,
    processId varchar (255) NULL,
    PRIMARY KEY (recordId)
);
```

6.3.8 Route-not-Read Table - Sender

```
CREATE TABLE [dbo].[broadcast] (
    [name] [char] (100) NULL ,
    [addresses] [char] (1000) NULL
) ON [PRIMARY]
GO
```

```
CREATE TABLE [dbo].[messagebins] (
    [recordId] [bigint] IDENTITY (1, 1) NOT NULL ,
    [messageId] [varchar] (255) NULL ,
    [payloadName] [varchar] (255) NULL ,
    [payloadBinaryContent] [image] NULL ,
    [payloadTextContent] [text] NULL ,
    [localFileName] [varchar] (255) NULL ,
    [service] [varchar] (255) NOT NULL ,
    [action] [varchar] (255) NOT NULL ,
    [arguments] [varchar] (255) NULL ,
    [fromPartyId] [varchar] (255) NULL ,
    [messageRecipient] [varchar] (255) NULL ,
    [errorCode] [varchar] (255) NULL ,
    [errorMessage] [varchar] (255) NULL ,
    [processingStatus] [varchar] (255) NULL ,
    [applicationStatus] [varchar] (255) NULL ,
    [encryption] [varchar] (10) NOT NULL ,
    [receivedTime] [varchar] (255) NULL ,
    [lastUpdateTime] [varchar] (255) NULL ,
    [processId] [varchar] (255) NULL
) ON [PRIMARY] TEXTIMAGE_ON [PRIMARY]
GO
```

```
CREATE TABLE [dbo].[partyid_user] (
    [partyId] [char] (255) NULL ,
    [user] [char] (255) NULL ,
    [sdnuser] [char] (255) NULL
) ON [PRIMARY]
GO
```

```
CREATE TABLE [dbo].[users] (
    [name] [char] (100) NULL ,
    [description] [char] (255) NULL
) ON [PRIMARY]
GO
```

6.4 HSQL Scripts

6.4.1 TransportQ Table - Sender

```
CREATE TABLE TransportQ_out (  
    recordId bigint NOT NULL IDENTITY,  
    messageId char (255) NULL ,  
    payloadFile char (255) NULL ,  
    payloadContent LONGVARBINARY NULL ,  
    destinationFilename char (255) NULL ,  
    routeInfo char (255) NOT NULL ,  
    service char (255) NOT NULL ,  
    action char (255) NOT NULL ,  
    arguments char (255) NULL ,  
    messageRecipient char (255) NULL ,  
    messageCreationTime char (255) NULL ,  
    encryption char (10) NOT NULL ,  
    signature char (10) NOT NULL ,  
    publicKeyLdapAddress char (255) NULL ,  
    publicKeyLdapBaseDN char (255) NULL ,  
    publicKeyLdapDN char (255) NULL ,  
    certificateURL char (255) NULL ,  
    processingStatus char (255) NULL ,  
    transportStatus char (255) NULL ,  
    transportErrorCode char (255) NULL ,  
    applicationStatus char (255) NULL ,  
    applicationErrorCode char (255) NULL ,  
    applicationResponse char (255) NULL ,  
    messageSentTime char (255) NULL ,  
    messageReceivedTime char (255) NULL ,  
    responseMessageId char (255) NULL ,  
    responseArguments char (255) NULL ,  
    responseLocalFile char (255) NULL ,  
    responseFilename char (255) NULL ,  
    responseContent LONGVARBINARY NULL ,  
    responseMessageOrigin char (255) NULL ,  
    responseMessageSignature char (255) NULL ,  
    priority int NULL  
)
```

6.4.2 WorkerQ Table - Sender

```
CREATE TABLE message_inq (  
    recordId bigint NOT NULL IDENTITY,  
    messageId varchar (255) NULL ,  
    payloadName varchar (255) NULL ,  
    payloadBinaryContent LONGVARBINARY NULL ,  
    payloadTextContent LONGVARCHAR NULL ,  
    localFileName varchar (255) NOT NULL ,  
    service varchar (255) NOT NULL ,  
    action varchar (255) NOT NULL ,  
    arguments varchar (255) NULL ,  
    fromPartyId varchar (255) NULL ,  
    messageRecipient varchar (255) NULL ,  
    errorCode varchar (255) NULL ,  
    errorMessage varchar (255) NULL ,
```

```
processingStatus varchar (255) NULL ,  
applicationStatus varchar (255) NULL ,  
encryption varchar (10) NOT NULL ,  
receivedTime varchar (255) NULL ,  
lastUpdateTime varchar (255) NULL ,  
processId varchar (255) NULL  
)
```

6.4.3 ErrorQ Table - Sender

```
CREATE TABLE PHINMS_errq (  
recordId bigint NOT NULL IDENTITY,  
messageId varchar (255) NULL ,  
payloadName varchar (255) NULL ,  
payloadBinaryContent LONGVARBINARY NULL ,  
payloadTextContent LONGVARCHAR NULL ,  
localFileName varchar (255) NOT NULL ,  
service varchar (255) NOT NULL ,  
action varchar (255) NOT NULL ,  
arguments varchar (255) NULL ,  
fromPartyId varchar (255) NULL ,  
messageRecipient varchar (255) NULL ,  
errorCode varchar (255) NULL ,  
errorMessage varchar (255) NULL ,  
processingStatus varchar (255) NULL ,  
applicationStatus varchar (255) NULL ,  
encryption varchar (10) NOT NULL ,  
receivedTime varchar (255) NULL ,  
lastUpdateTime varchar (255) NULL ,  
processId varchar (255) NULL  
)
```

6.4.4 Messaging Cache Table - Sender

```
CREATE TABLE messagingcache (  
sequence int NOT NULL IDENTITY,  
partyId char (50) NULL ,  
convId char (50) NULL ,  
recordId char (50) NULL ,  
response LONGVARCHAR NULL ,  
timestamp char (20) NULL ,  
status char (10) NULL  
)
```

6.4.5 Messaging Queue Table – Receiver

```
CREATE TABLE message_outq (  
recordId bigint NOT NULL IDENTITY,  
messageId varchar (255) NULL ,  
payloadName varchar (255) NULL ,  
payloadBinaryContent LONGVARBINARY NULL ,  
payloadTextContent LONGVARCHAR NULL ,  
localFileName varchar (255) NOT NULL ,  
service varchar (255) NOT NULL ,  
action varchar (255) NOT NULL ,  
arguments varchar (255) NULL ,  
fromPartyId varchar (255) NULL ,  
messageRecipient varchar (255) NULL ,
```



```
errorCode varchar (255) NULL ,  
errorMessage varchar (255) NULL ,  
processingStatus varchar (255) NULL ,  
applicationStatus varchar (255) NULL ,  
encryption varchar (10) NOT NULL ,  
receivedTime varchar (255) NULL ,  
lastUpdateTime varchar (255) NULL ,  
processId varchar (255) NULL
```

)

6.4.6 TransportQ Table - Receiver

```
CREATE TABLE message_outq (  
    recordId bigint NOT NULL IDENTITY,  
    messageId varchar (255) NULL ,  
    payloadName varchar (255) NULL ,  
    payloadBinaryContent LONGVARBINARY NULL ,  
    payloadTextContent LONGVARCHAR NULL ,  
    localFileName varchar (255) NOT NULL ,  
    service varchar (255) NOT NULL ,  
    action varchar (255) NOT NULL ,  
    arguments varchar (255) NULL ,  
    fromPartyId varchar (255) NULL ,  
    messageRecipient varchar (255) NULL ,  
    errorCode varchar (255) NULL ,  
    errorMessage varchar (255) NULL ,  
    processingStatus varchar (255) NULL ,  
    applicationStatus varchar (255) NULL ,  
    encryption varchar (10) NOT NULL ,  
    receivedTime varchar (255) NULL ,  
    lastUpdateTime varchar (255) NULL ,  
    processId varchar (255) NULL
```

)

6.4.7 ErrorQ Table - Receiver

```
CREATE TABLE message_errq (  
    recordId bigint NOT NULL IDENTITY,  
    messageId varchar (255) NULL ,  
    payloadName varchar (255) NULL ,  
    payloadBinaryContent LONGVARBINARY NULL ,  
    payloadTextContent LONGVARCHAR NULL ,  
    localFileName varchar (255) NOT NULL ,  
    service varchar (255) NOT NULL ,  
    action varchar (255) NOT NULL ,  
    arguments varchar (255) NULL ,  
    fromPartyId varchar (255) NULL ,  
    messageRecipient varchar (255) NULL ,  
    errorCode varchar (255) NULL ,  
    errorMessage varchar (255) NULL ,  
    processingStatus varchar (255) NULL ,  
    applicationStatus varchar (255) NULL ,  
    encryption varchar (10) NOT NULL ,  
    receivedTime varchar (255) NULL ,  
    lastUpdateTime varchar (255) NULL ,  
    processId varchar (255) NULL
```

)