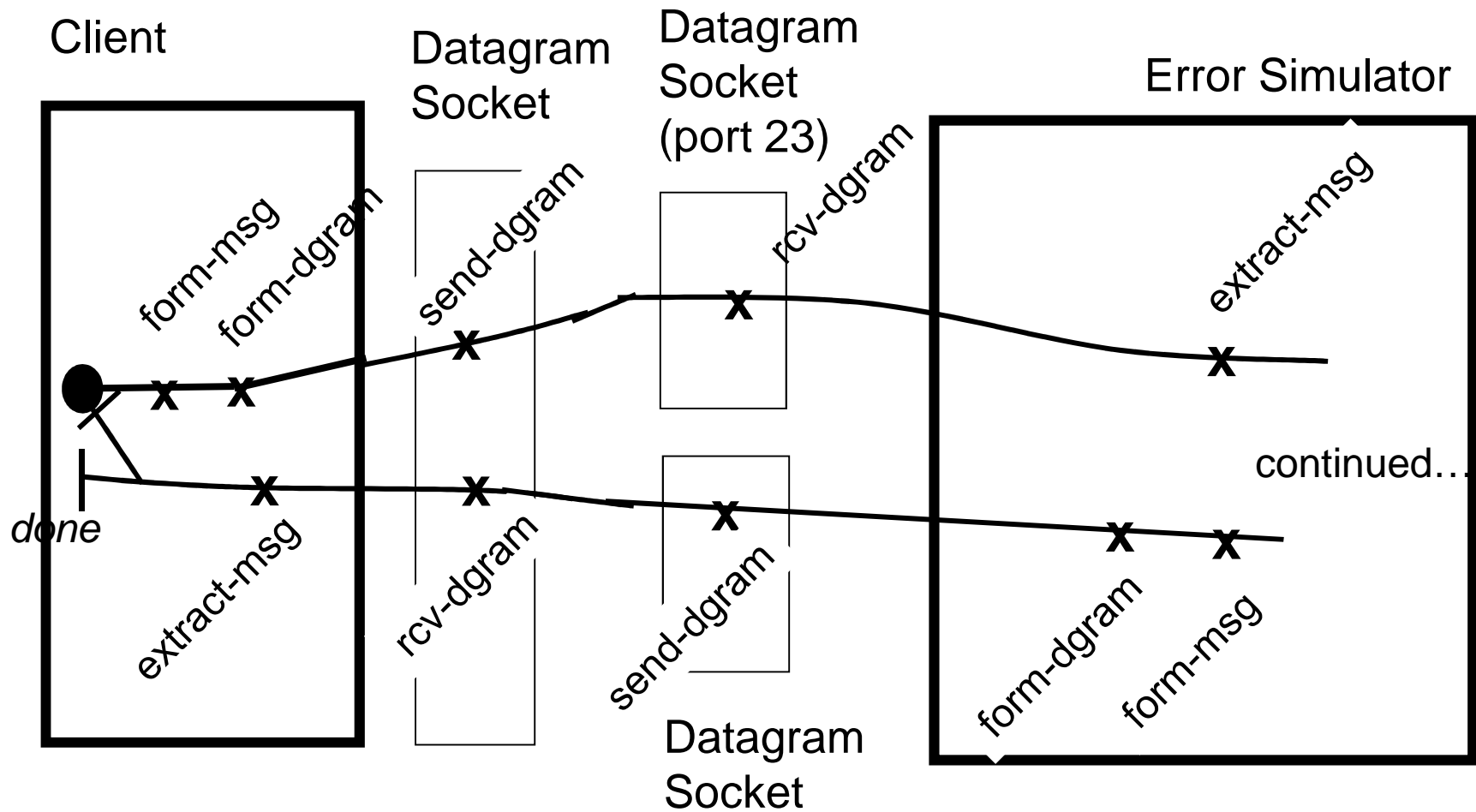# SYSC 3303 Real-Time Concurrent Systems

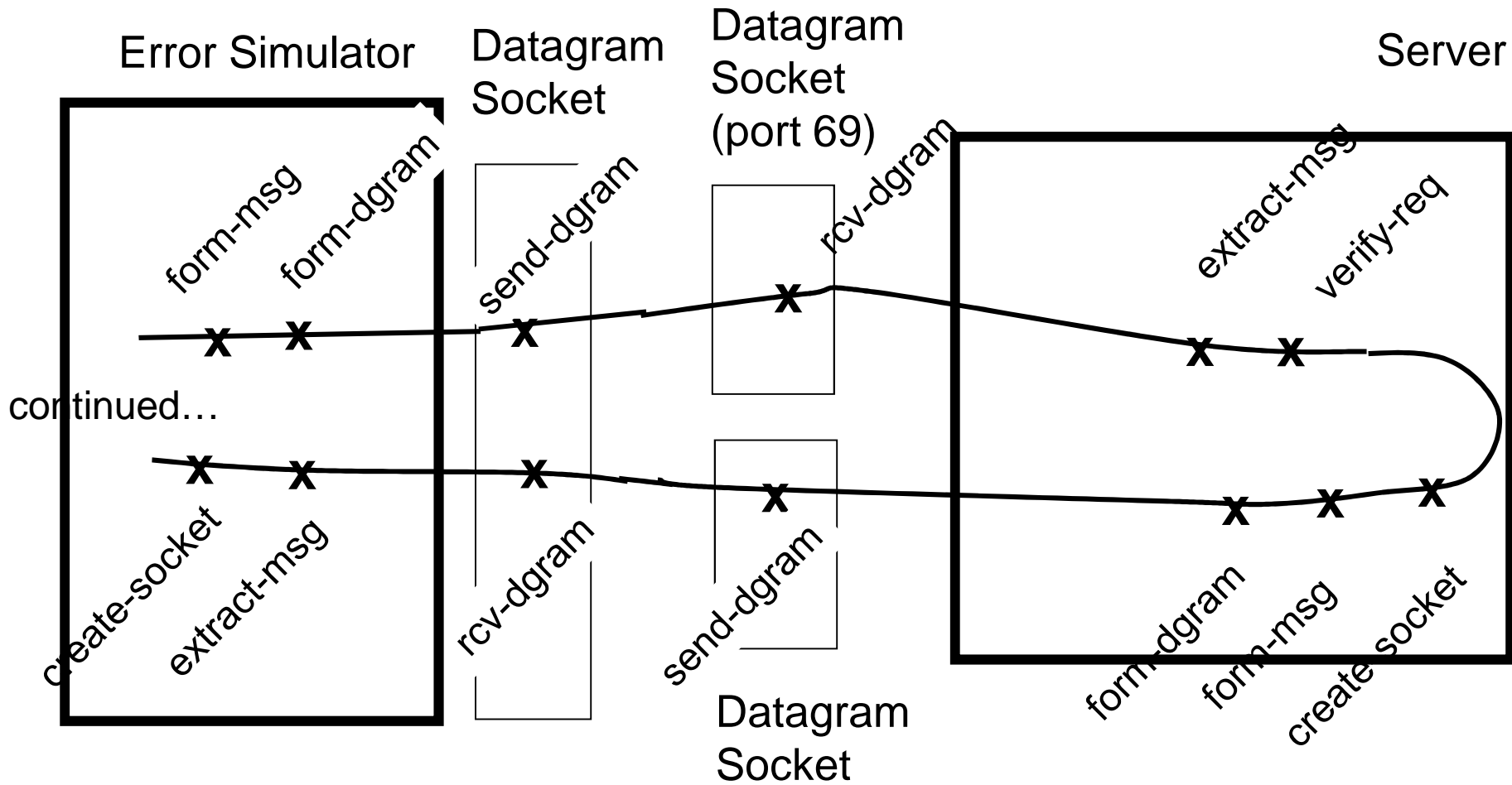## Assignment #1
Sample Solutions

Two page UCM for TFTP System

Client

Datagram
Socket

Datagram
Socket
(port 23)

Error Simulator

form-msg

form-dgram

send-dgram

rcv-dgram

extract-msg

done

extract-msg

rcv-dgram

send-dgram

form-dgram

form-msg

continued…

Datagram
Socket

2

Page 2

Error Simulator

Datagram Socket

Datagram Socket (port 69)

Server

form-msg

form-dgram

send-dgram

rcv-dgram

extract-msg

verify-req

continued…

create-socket

extract-msg

rcv-dgram

send-dgram

form-dgram

form-msg

create socket

Datagram Socket

3

TFTP Client Collaboration Diagram

Steps 2-5 iterate
11 times (but 11th
iteration is
incomplete, in this
case.

1 : <<create>>
3 : send(sendPacket)
5 : receive(receivePacket)

sendReceiveSocket :
DatagramSocket

: TFTPClient

6 : close()

2 : <<create>>

4 : <<create>>

sendPacket :
DatagramPacket

receivePacket :
DatagramPacket
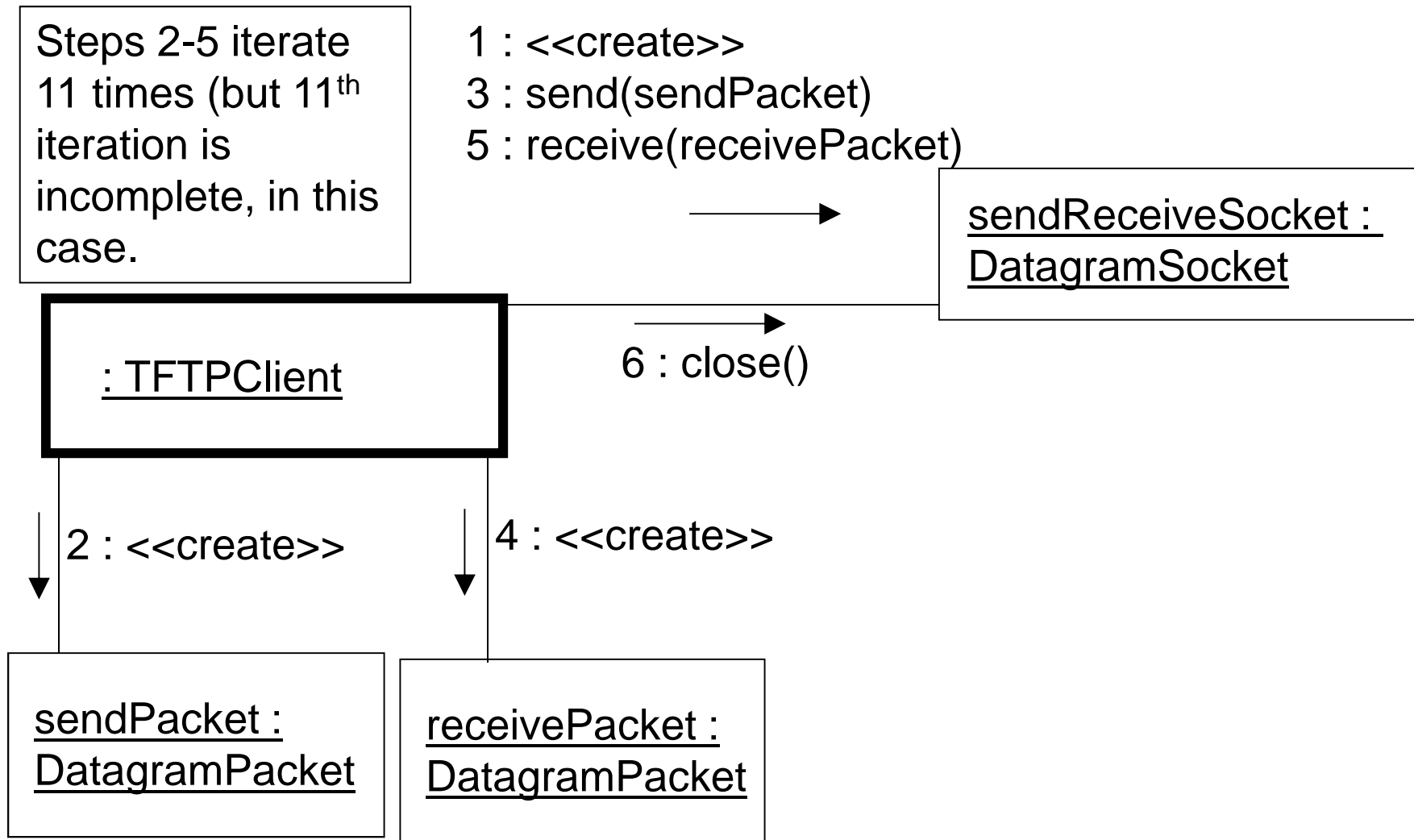
TFTP Simulator Collaboration Diagram

: TFTPSim

1 : << create>>
4 : receive(receivePacket)

receiveSocket :
DatagramSocket
{port = 23}

3 : <<create>>
7 : <<create>>

receivePacket :
DatagramPacket

9 : <<create>>
11 : send(sendPacket)
12 : close()

sendSocket :
DatagramSocket

5 : <<create>>
10 : <<create>>

sendPacket :
DatagramPacket

sendReceiveSocket :
DatagramSocket

2 : <<create>>
6 : send(sendPacket)
8 : receive(receivePacket)

Steps 3-12 iterate.

5
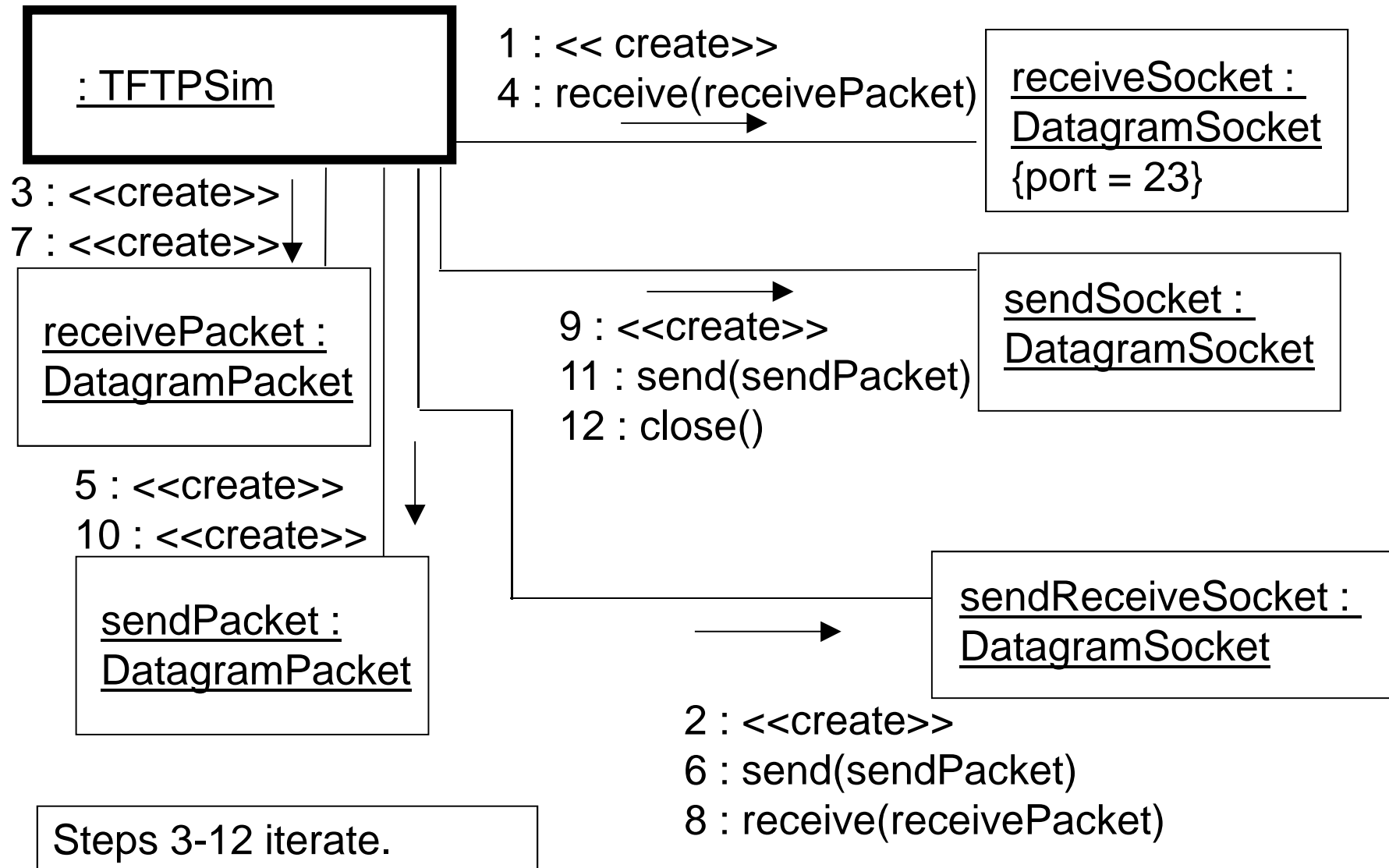
TFTP Server Collaboration Diagram

: TFTPServer

1 : << create >>
3 : receive(receivePacket)

listenerSocket :
DatagramSocket
{port = 69}

2 : <<create>>

receivePacket :
DatagramPacket

5 : <<create>>
6 : send(sendPacket)
7 : close()

connSocket :
DatagramSocket

4 : <<create>>

sendPacket :
DatagramPacket
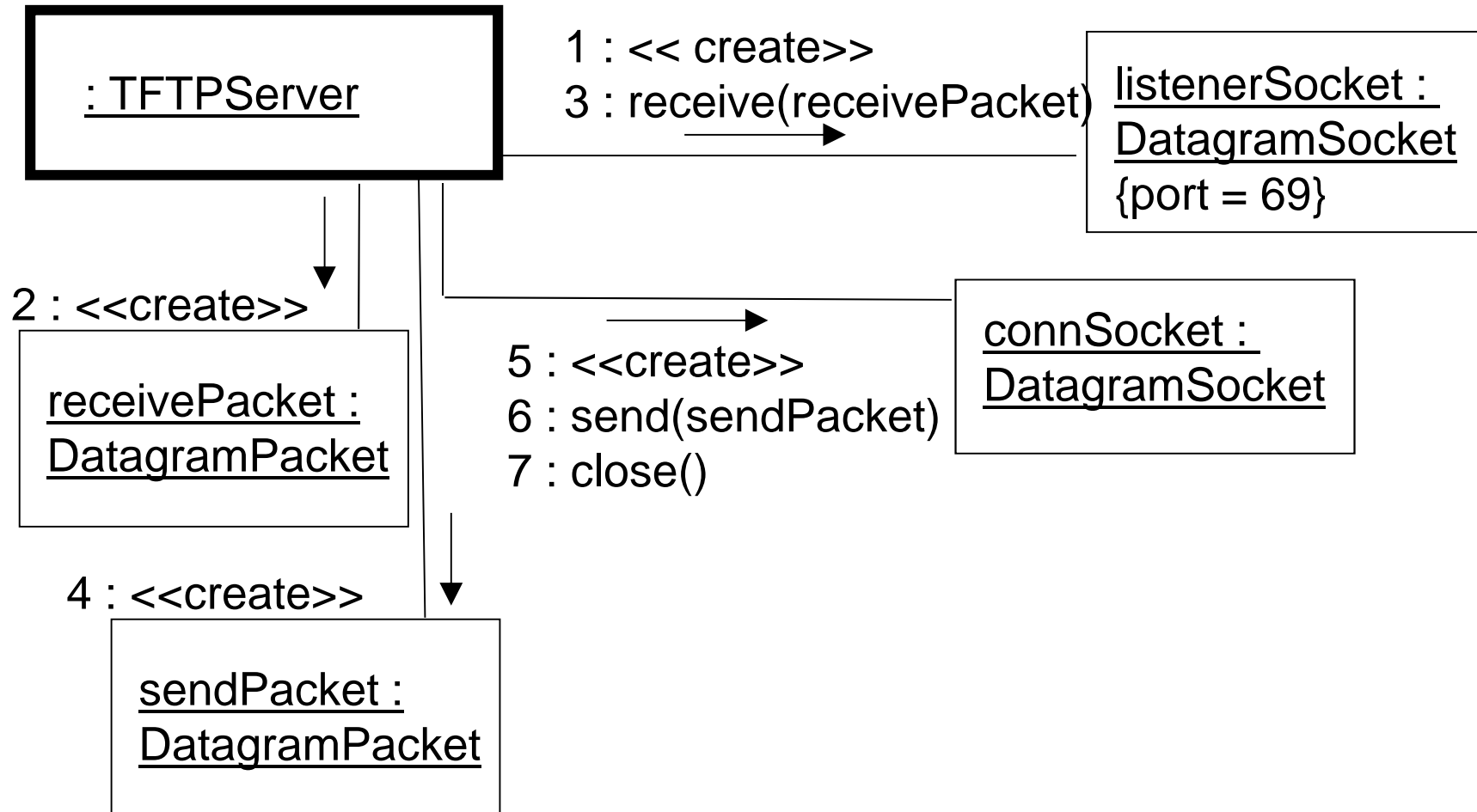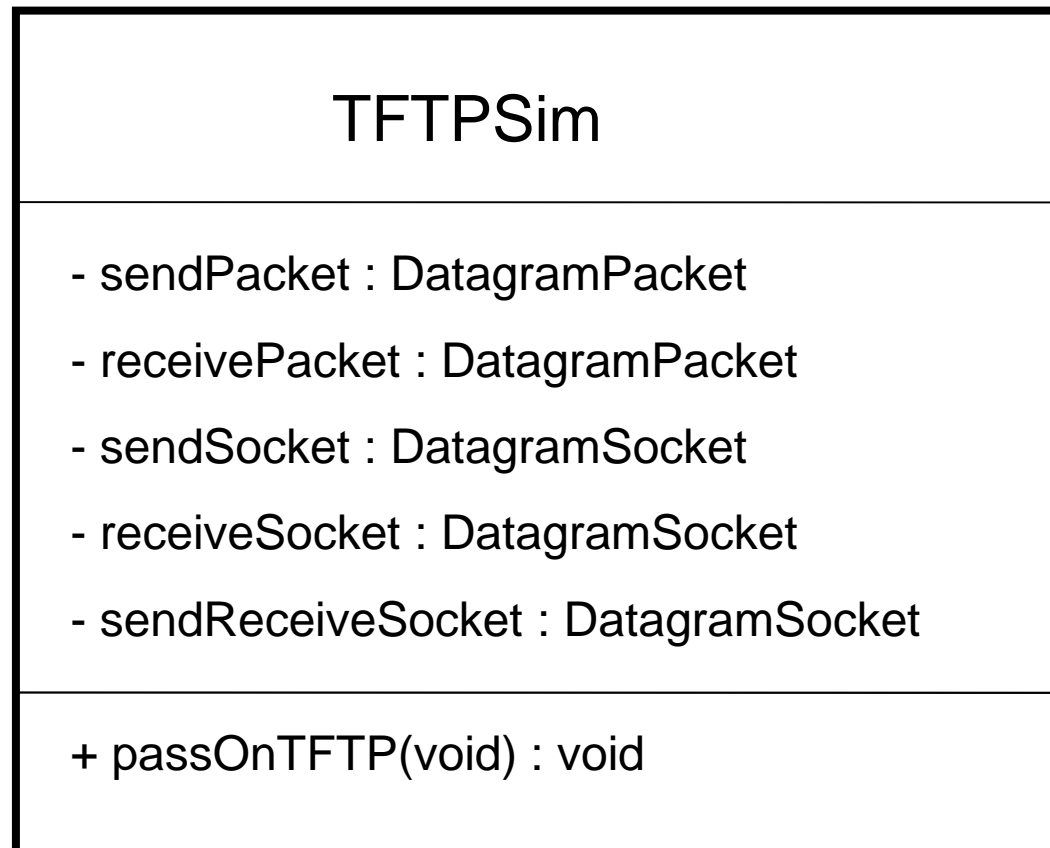
Steps 2-7 iterate; with server throwing an
uncaught exception, if the received packet
is invalid.

6

TFTP Class Diagram (p.1 of 3)

TFTPClient
- sendPacket : DatagramPacket - receivePacket : DatagramPacket - sendReceiveSocket : DatagramSocket
+ sendAndReceive(void) : void
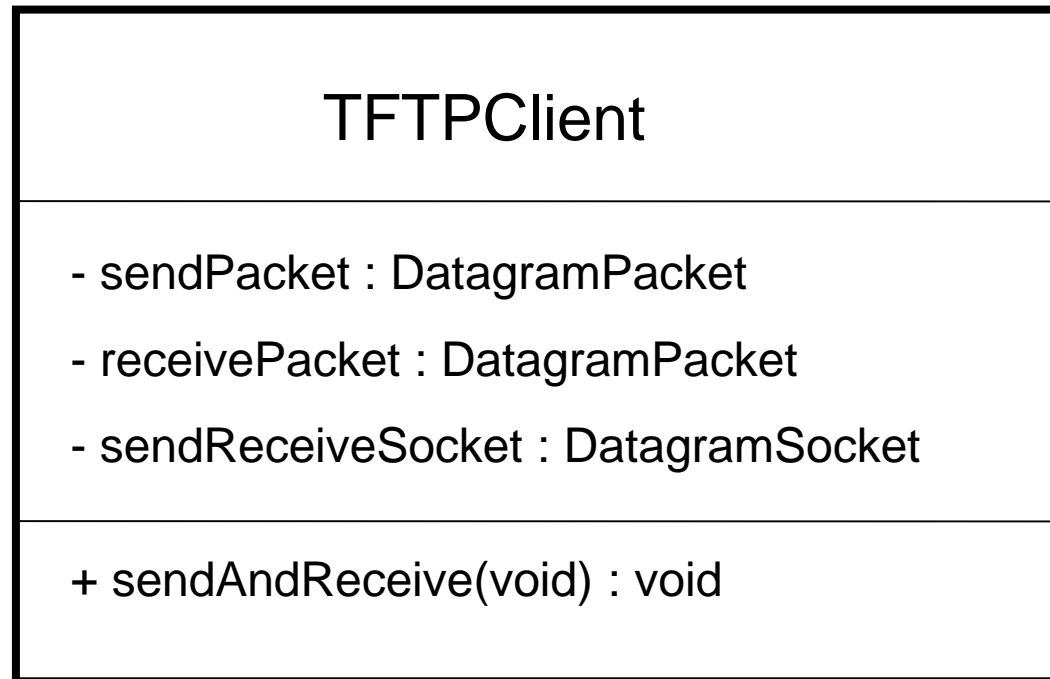
TFTP Class Diagram (p.2 of 3)

TFTPSim
- sendPacket : DatagramPacket - receivePacket : DatagramPacket - sendSocket : DatagramSocket - receiveSocket : DatagramSocket - sendReceiveSocket : DatagramSocket
+ passOnTFTP(void) : void

TFTP Class Diagram (p.3 of 3)

TFTPServer
+ readResp[0..3:ordered] : byte = { 0 3 0 1 } + writeResp[0..3:ordered] : byte = { 0 4 0 0 } - sendPacket : DatagramPacket - receivePacket : DatagramPacket - sendSocket : DatagramSocket - receiveSocket : DatagramSocket
+ receiveAndSendTFTP(void) : void