

Port Forwarder Testing Document

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Summary

Test #	Test Procedure	Parameters	Expected Outcome	Actual Outcome	Pass / Fail
TCP_T1	Send data back and forth through port forwarder	“Hello” from Client to Server. “Hello Back” from Server to Client	Message Sends and Transfers Successfully	Message Sends and Transfers Successfully	Pass
UDP_T1	Send data back and forth through port forwarder. Creates new record	“Hello” from Client to Server. “Hello Back” from Server to Client	Message Sends and Transfers Successfully	Message Sends and Transfers Successfully	Pass
UDP_T2	Send data back and forth through port forwarder with existing record	“Hello” from Client to Server. “Hello Back” from Server to Client	Message Sends and Transfers Successfully	Message Sends and Transfers Successfully	Pass
SSH_T1	Connect to SSH server through port forwarder	N/A	Connection Establishes, functions and disconnects successfully	Connection Establishes, functions and disconnects successfully	Pass
SSH_T2	Connect to non-existent SSH server through port forwarder	N/A	Connection fails to connect. User gets prompt of failed connection. Server Resets	Connection fails to connect. User gets prompt of failed connection. Server Resets	Pass
HTTP_T1	Connect to HTTP server through port forwarder	N/A	Connection Establishes, functions and disconnects successfully	Connection Establishes, functions and disconnects successfully	Pass
HTTP_T2	Connect to non-existent HTTP server through port forwarder	N/A	Connection fails to connect. User gets prompt of failed connection. Server Resets	Connection fails to connect. User gets prompt of failed connection. Server Resets	Pass

TELNET_T1	Connect to Telnet server through port forwarder	N/A	Connection Establishes, functions and disconnects successfully	Connection Establishes, functions and disconnects successfully	Pass
TELNET_T2	Connect to non-existent Telnet server through port forwarder	N/A	Connection fails to connect. User gets prompt of failed connection. Server Resets	Connection fails to connect. User gets prompt of failed connection. Server Resets	Pass
SSL_T1	Connect to SSL server through port forwarder	N/A	Connection Establishes, functions and disconnects successfully	Connection Establishes, functions and disconnects successfully	Pass
SSL_T2	Connect to non-existent SSL server through port forwarder	N/A	Connection fails to connect. User gets prompt of failed connection. Server Resets	Connection fails to connect. User gets prompt of failed connection. Server Resets	Pass
SFTP_T1	Connect to SFTP server through port forwarder	N/A	Connection Establishes, functions and disconnects successfully	Connection Establishes, functions and disconnects successfully	Pass
SFTP_T2	Connect to non-existent SFTP server through port forwarder	N/A	Connection fails to connect. User gets prompt of failed connection. Server Resets	Connection fails to connect. User gets prompt of failed connection. Server Resets	Pass
GUI_T1	Load with Mappings in DB	N/A	GUI Loads in Mappings as existing mappings	GUI Loads in Mappings as existing mappings	Pass
GUI_T2	Load with no Mappings in DB	N/A	GUI Loads and does no load any mappings as none exist	GUI Loads and does no load any mappings as none exist	Pass
GUI_T3	Create a UDP	N/A	UDP Mapping	UDP Mapping	Pass

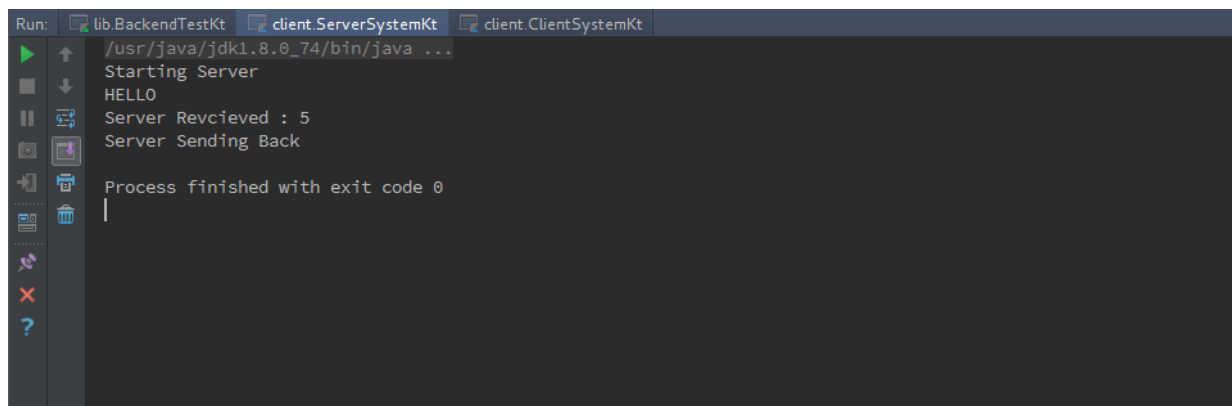
	Mapping		is Created and Connections can connect to new port	is Created and Connections can connect to new port	
GUI_T4	Create a TCP Mapping	N/A	TCP Mapping is Created and Connections can connect to new port	TCP Mapping is Created and Connections can connect to new port	Pass
GUI_T5	Delete a UDP Mapping	N/A	UDP Mapping is Deleted and Connections cannot connect to the old port	UDP Mapping is Deleted and Connections cannot connect to the old port	Pass
GUI_T6	Delete a TCP Mapping	N/A	TCP Mapping is Deleted and Connections cannot connect to the old port	TCP Mapping is Deleted and Connections cannot connect to the old port	Pass

Results

All original images can be found in the /doc/tests folder under their appropriate test# folder name

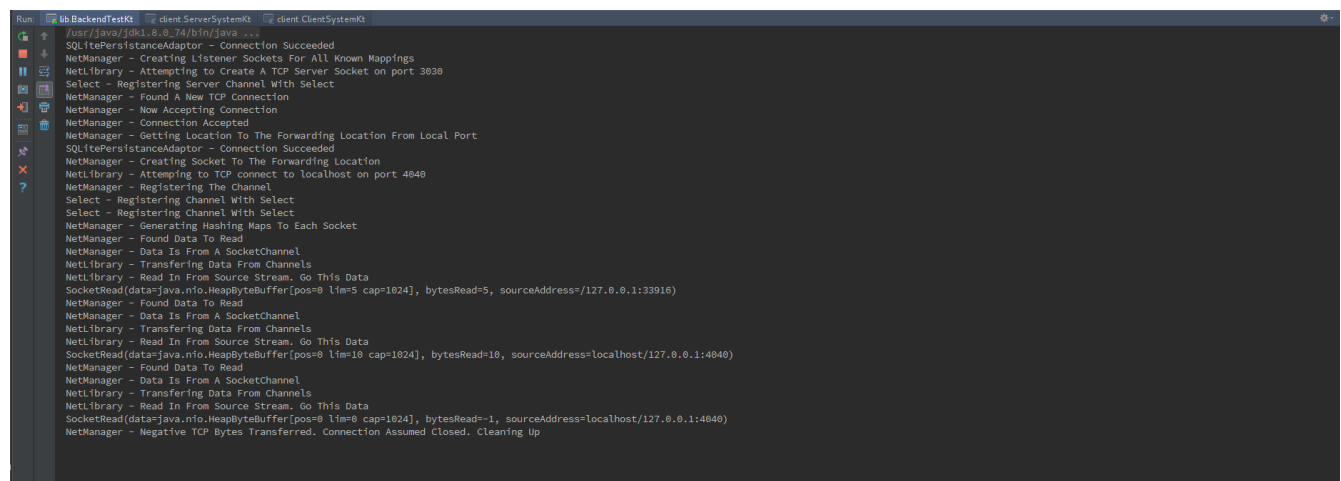
TCP_T1

Client



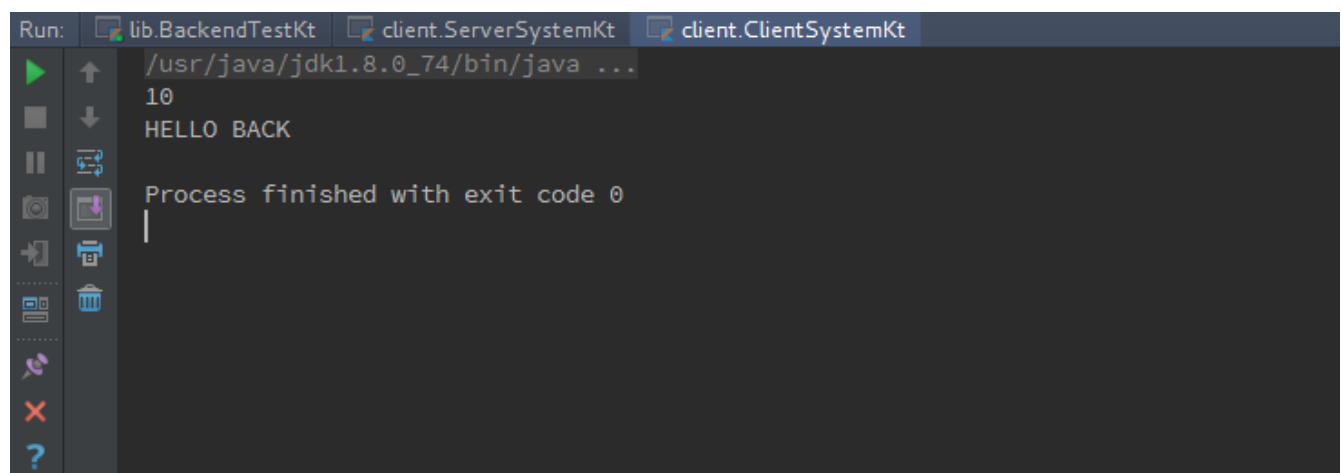
```
Run: lib.BackendTestKt client.ServerSystemKt client.ClientSystemKt
/usr/java/jdk1.8.0_74/bin/java ...
Starting Server
HELLO
Server Recvied : 5
Server Sending Back
Process finished with exit code 0
```

Port Forwarder



```
Run: lib.BackendTestKt client.ServerSystemKt client.ClientSystemKt
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A TCP Server Socket on port 3030
Select - Registering Server Channel With Select
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 4040
NetManager - Registering The Channel
Select - Registering Channel With Select
Select - Registering Channel With Select
NetManager - Generating Hashing Maps To Each Socket
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=5 cap=1024], bytesRead=5, sourceAddress=127.0.0.1:33916)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=10 cap=1024], bytesRead=10, sourceAddress=localhost/127.0.0.1:4040)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=0 cap=1024], bytesRead=-1, sourceAddress=localhost/127.0.0.1:4040)
NetManager - Negative TCP Bytes Transferred. Connection Assumed Closed. Cleaning Up
```

Server



```
Run: lib.BackendTestKt client.ServerSystemKt client.ClientSystemKt
/usr/java/jdk1.8.0_74/bin/java ...
10
HELLO BACK
Process finished with exit code 0
```

UDP_T1

Client

```
Run: lib.BackendTestKt client.UDPServerKt client.UDPClientKt
/usr/java/jdk1.8.0_74/bin/java ...
Sending message: HELLO
Converted it is: [B@66d3c617
Got Response
HELLO BACK
Process finished with exit code 0
```

Port Forwarder

```
Run: lib.BackendTestKt client.UDPServerKt client.UDPClientKt
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A UDP Server Socket on port 4040
Select - Registering Channel With Select
NetManager - Found Data To Read
NetManager - Data Is From A DatagramChannel
SQLitePersistenceAdaptor - Connection Succeeded
NetLibrary - Attempting to UDP connect to localhost on port 5050
Select - Registering Channel With Select
NetManager - Found Data To Read
NetManager - Data Is From A DatagramChannel
```

Server

```
Run: lib.BackendTestKt client.UDPServerKt client.UDPClientKt
/usr/java/jdk1.8.0_74/bin/java ...
Got Response
HELLO
Now Sending Message
Sending to: 127.0.0.1 on port 6000
Process finished with exit code 0
```


UDP_T2

Client

Port

```
Run: lib.BackendTestKt client.UDPServerKt client.UDPClientKt
/usr/java/jdk1.8.0_74/bin/java ...
Sending message: HELLO
Converted it is: [B@66d3c617
Got Response
HELLO BACK
Process finished with exit code 0
```

Forwarder

```
Run: lib.BackendTestKt client.UDPServerKt client.UDPClientKt
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A UDP Server Socket on port 4040
Select - Registering Channel With Select
NetManager - Found Data To Read
NetManager - Data Is From A DatagramChannel
SQLitePersistenceAdaptor - Connection Succeeded
NetLibrary - Attempting to UDP connect to localhost on port 5050
Select - Registering Channel With Select
NetManager - Found Data To Read
NetManager - Data Is From A DatagramChannel
NetManager - Found Data To Read
NetManager - Data Is From A DatagramChannel
NetManager - Found Data To Read
NetManager - Data Is From A DatagramChannel
```

Server

```
Run: lib.BackendTestKt client.UDPServerKt client.UDPClientKt
/usr/java/jdk1.8.0_74/bin/java ...
Got Response
HELLO
Now Sending Message
Sending to: 127.0.0.1 on port 6000
Process finished with exit code 0
```

SSH_T1

Client

```
[bensoer@ironhide ~]$ ssh localhost -p 4040
bensoer@localhost's password:
Last login: Thu Mar 24 17:45:20 2016 from 127.0.0.1
[bensoer@ironhide ~]$ exit
logout
Connection to localhost closed.
[bensoer@ironhide ~]$
```

Mapping

<Filter criteria>					
ID	LOCALPORT	DESTIP	DESTPORT	TYPE	
1 28	4040	localhost	22	TCP	

Port Forwarder

```
Run libBackendTestKit
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdapter - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A TCP Server Socket on port 4040
Select - Registering Server Channel With Select
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdapter - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 22
NetManager - Registering The Channel
Select - Registering Channel With Select
Select - Registering Channel With Select
NetManager - Generating Hashing Maps To Each Socket
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=21 cap=1024], bytesRead=21, sourceAddress=/127.0.0.1:38702)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=21 cap=1024], bytesRead=21, sourceAddress=localhost/127.0.0.1:22)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=1024 cap=1024], bytesRead=1024, sourceAddress=/127.0.0.1:38702)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=944 cap=1024], bytesRead=944, sourceAddress=/127.0.0.1:38702)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
```

SSH_T2

Client

```
[bensoer@ironhide ~]$ ssh localhost -p 4040
ssh_exchange_identification: read: Connection reset by peer
[bensoer@ironhide ~]$ ssh localhost -p 4040
ssh_exchange_identification: read: Connection reset by peer
[bensoer@ironhide ~]$
```

Mapping

ID	LOCALPORT	DESTIP	DESTPORT	TYPE
1	28	4040	localhost	22
TCP				

Port Forwarder

```
Run lib.BackendTestKt
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A TCP Server Socket on port 4040
Select - Registering Server Channel With Select
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 22
NetLibrary - Unable To Access IO: localhost, 22
NetManager - Unable To Connect To Forwarding Server. Terminating Connection
NetManager - Cleanup Complete. We Are Still Running
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 22
NetLibrary - Unable To Access IO: localhost, 22
NetManager - Unable To Connect To Forwarding Server. Terminating Connection
NetManager - Cleanup Complete. We Are Still Running
```

HTTP_T1

Client



This page is used to test the proper operation of the Apache HTTP server after it has been installed. If you can read this page, it means the installation is successful.

If you are a member of the general public:

The fact that you are seeing this page indicates that the website you just visited is either experiencing problems, or is undergoing routine maintenance.

If you would like to let the administrators of this website know that you've seen this page instead of the page you expected, you should send them e-mail. In general, mail sent to the name "webmaster" and directed to the website's domain should reach the appropriate person.

For example, if you experienced problems while visiting www.example.com, you should send e-mail to "webmaster@example.com".

Fedora is a distribution of Linux, a popular computer operating system. It is commonly used by hosting companies because it is free, and includes free web server software. Many times, they do not set up their web server correctly, and it displays this "test page" instead of the expected website.

Accordingly, please keep these facts in mind:

- Neither the Fedora Project or Red Hat has any affiliation with any website or content hosted from this server (unless otherwise explicitly stated).
- Neither the Fedora Project or Red Hat has "hacked" this webserver: this test page is an included component of Apache's httpd.

Mapping

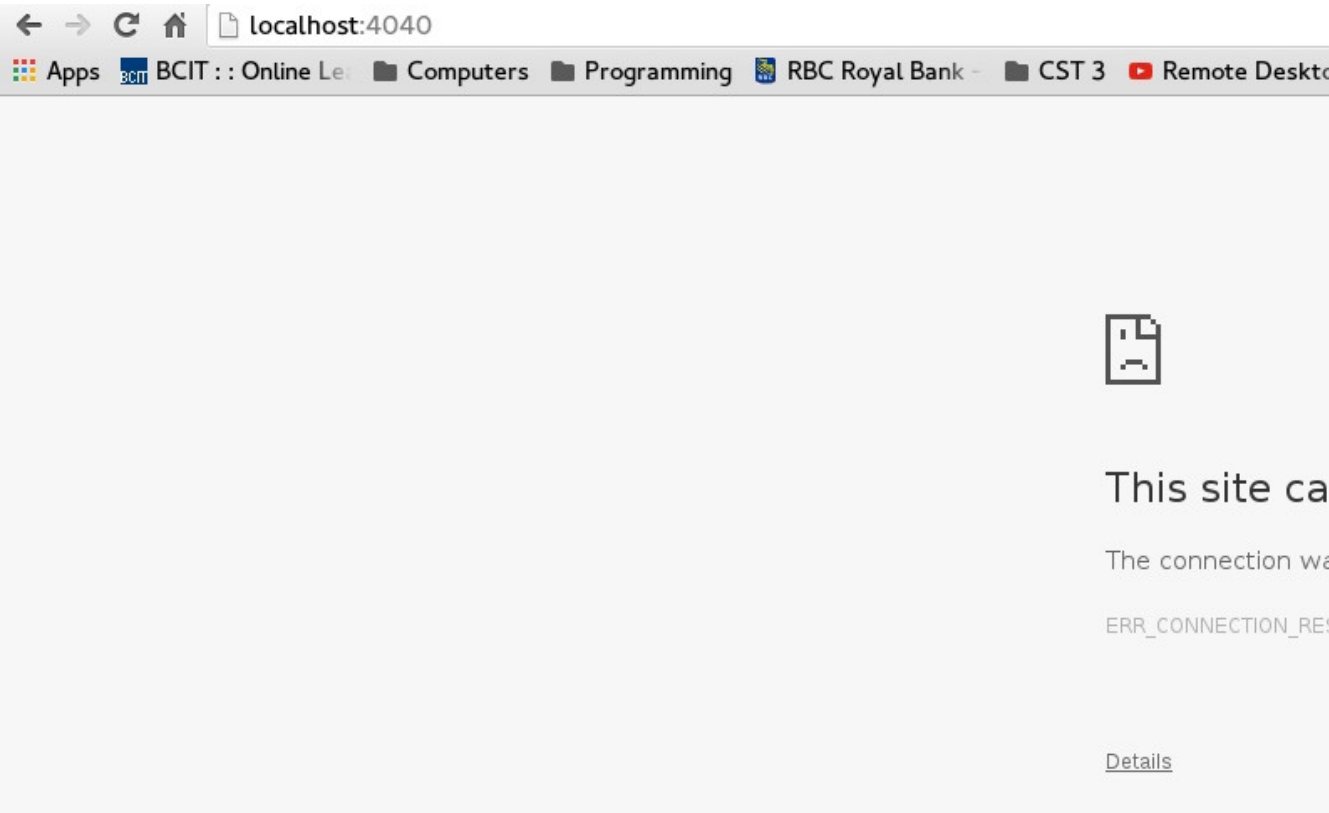
ID	LOCALPORT	DESTIP	DESTPORT	TYPE
1 28	4040	localhost	80	TCP

Port Forwarder

```
Run lib.BackendTestKt
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A TCP Server Socket on port 4040
Select - Registering Server Channel With Select
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 80
NetManager - Registering The Channel
Select - Registering Channel With Select
Select - Registering Channel With Select
NetManager - Generating Hashing Maps To Each Socket
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=449 cap=1024], bytesRead=449, sourceAddress=/127.0.0.1:38742)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=1024 cap=1024], bytesRead=1024, sourceAddress=localhost/127.0.0.1:80)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=1024 cap=1024], bytesRead=1024, sourceAddress=localhost/127.0.0.1:80)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=1024 cap=1024], bytesRead=1024, sourceAddress=localhost/127.0.0.1:80)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
```

HTTP_T2

Client



Mapping

<Filter criteria>					
ID	LOCALPORT	DESTIP	DESTPORT	TYPE	
1 28	4040	localhost	80	TCP	

Port Forwarder

```
Run lib BackendTestKt
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A TCP Server Socket on port 4040
Select - Registering Server Channel With Select
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 80
NetLibrary - Unable To Access IO: localhost, 80
NetManager - Unable To Connect To Forwarding Server. Terminating Connection
NetManager - Cleanup Complete. We Are Still Running
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 80
NetLibrary - Unable To Access IO: localhost, 80
NetManager - Unable To Connect To Forwarding Server. Terminating Connection
NetManager - Cleanup Complete. We Are Still Running
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 80
NetLibrary - Unable To Access IO: localhost, 80
NetManager - Unable To Connect To Forwarding Server. Terminating Connection
NetManager - Cleanup Complete. We Are Still Running
NetManager - Found A New TCP Connection
```

TELNET_T1

Client

```
[bensoer@ironhide ~]$ telnet localhost 4040
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^'.
Fedora release 22 (Twenty Two)
Kernel 4.4.5-200.fc22.x86_64 on an x86_64 (4)
ironhide login: bensoer
Password:
Last login: Thu Mar 24 18:31:17 from 127.0.0.1
[bensoer@ironhide ~]$ exit
logout
Connection closed by foreign host.
[bensoer@ironhide ~]$
```

Mapping

<Filter criteria>					
ID	LOCALPORT	DESTIP	DESTPORT	TYPE	
1 28	4040	localhost	23	TCP	

Port Forwarder

```
Run lib.BackendTestKt
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A TCP Server Socket on port 4040
Select - Registering Server Channel With Select
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 23
NetManager - Registering The Channel
Select - Registering Channel With Select
Select - Registering Channel With Select
NetManager - Generating Hashing Maps To Each Socket
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=12 cap=1024], bytesRead=12, sourceAddress=localhost/127.0.0.1:23)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=12 cap=1024], bytesRead=12, sourceAddress=/127.0.0.1:38796)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=24 cap=1024], bytesRead=24, sourceAddress=localhost/127.0.0.1:23)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=119 cap=1024], bytesRead=119, sourceAddress=/127.0.0.1:38796)
NetManager - Found Data To Read
```

TELNET_T2

Client

```
[bensoer@ironhide ~]$ telnet localhost 4040
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Connection closed by foreign host.
[bensoer@ironhide ~]$
```

Mapping

<Filter criteria>				
ID	LOCALPORT	DESTIP	DESTPORT	TYPE
1 28	4040	localhost	23	TCP

Port Forwarder

```
Run lib.BackendTestKt
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A TCP Server Socket on port 4040
Select - Registering Server Channel With Select
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 23
NetLibrary - Unable To Access IO: localhost, 23
NetManager - Unable To Connect To Forwarding Server. Terminating Connection
NetManager - Cleanup Complete. We Are Still Running
```

SSL_T1

Client

```
etsang@ennui: ~/Downloads/client
etsang@ennui:~/Downloads/client$ ./sclient 192.168.1.72 443
Connected:      Server Name: 192.168.1.72
                IP Address: 192.168.1.72
Enter Text to Transmit:
hey there
Receive:
hey there
etsang@ennui:~/Downloads/client$
```

Mapping

ID	LOCALPORT	DESTIP	DESTPORT	TYPE
4	443	192.168.1.74	443	TCP

Port Forwarder

```
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to 192.168.1.74 on port 443
NetManager - Registering The Channel
Select - Registering Channel With Select
Select - Registering Channel With Select
NetManager - Generating Hashing Maps To Each Socket
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=128 cap=1024], bytesRead=128, sourceAddress=/192.168.1.74:45001)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=1024 cap=1024], bytesRead=1024, sourceAddress=/192.168.1.74:443)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=966 cap=1024], bytesRead=966, sourceAddress=/192.168.1.74:443)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=214 cap=1024], bytesRead=214, sourceAddress=/192.168.1.74:45001)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=75 cap=1024], bytesRead=75, sourceAddress=/192.168.1.74:443)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=330 cap=1024], bytesRead=330, sourceAddress=/192.168.1.74:45001)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=330 cap=1024], bytesRead=330, sourceAddress=/192.168.1.74:443)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=0 cap=1024], bytesRead=-1, sourceAddress=/192.168.1.74:443)
NetManager - Negative TCP Bytes Transferred. Connection Assumed Closed. Cleaning Up
```

SSL_T2

Client

```
etsang@ennui: ~/Downloads/client
etsang@ennui:~/Downloads/client$ ./sclient 192.168.1.72 443
Connected:      Server Name: 192.168.1.72
                IP Address: 192.168.1.72
```

Mapping

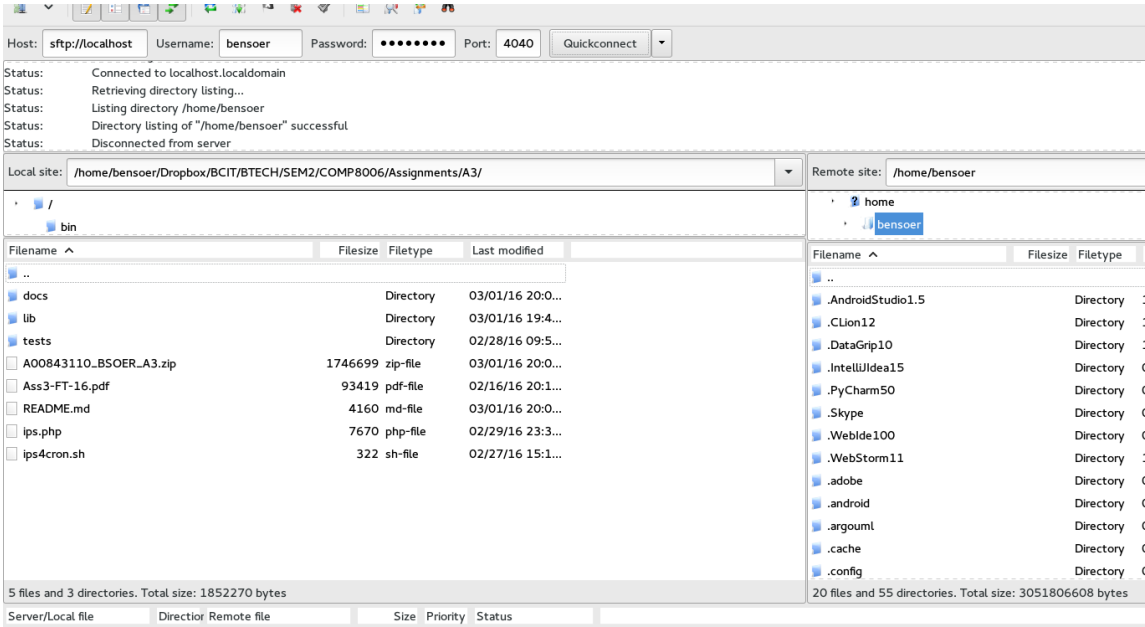
ID	LOCALPORT	DESTIP	DESTPORT	TYPE
4	443	192.168.1.74	443	TCP

Port Forwarder

```
"C:\Program Files\Java\jdk1.8.0_60\bin\java" ...
PortForwarder - Initializing Program
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
SQLitePersistenceAdaptor - Connection Succeeded
NetLibrary - Attempting to Create A TCP Server Socket on port 443
Select - Registering Server Channel With Select
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to 192.168.1.74 on port 443
NetLibrary - Unable To Access IO: 192.168.1.74, 443
NetManager - Unable To Connect To Forwarding Server. Terminating Connection
NetManager - Cleanup Complete. We Are Still Running
```

SFTP_T1

Client



Mapping

<Filter criteria>					
ID	LOCALPORT	DESTIP	DESTPORT	TYPE	
1	28	localhost	22	TCP	

Port Forwarder

```
Run lib.BackendTestKit
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A TCP Server Socket on port 4040
Select - Registering Server Channel With Select
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 22
NetManager - Registering The Channel
Select - Registering Channel With Select
Select - Registering Channel With Select
NetManager - Generating Hashing Maps To Each Socket
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=43 cap=1024], bytesRead=43, sourceAddress=/127.0.0.1:44551)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=21 cap=1024], bytesRead=21, sourceAddress=localhost/127.0.0.1:22)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=784 cap=1024], bytesRead=784, sourceAddress=/127.0.0.1:44551)
NetManager - Found Data To Read
NetManager - Data Is From A SocketChannel
NetLibrary - Transferring Data From Channels
NetLibrary - Read In From Source Stream. Go This Data
SocketRead(data=java.nio.HeapByteBuffer[pos=0 lim=944 cap=1024], bytesRead=944, sourceAddress=localhost/127.0.0.1:22)
```

SFTP_T2

Client

```
Host: sftp://localhost Username: bensoer Password: ..... Port: 4040
Status: Connecting to localhost...
Response: fzSftp started, protocol_version=2
Command: open "bensoer@localhost" 22
Error: Connection refused
Error: Could not connect to server
Status: Disconnected from server
Status: Connecting to localhost:4040...
Response: fzSftp started, protocol_version=2
Command: open "bensoer@localhost" 4040
Error: Connection reset by peer
Error: Could not connect to server
Status: Waiting to retry...
Status: Connecting to localhost:4040...
Response: fzSftp started, protocol_version=2
Command: open "bensoer@localhost" 4040
Error: Connection reset by peer
Error: Could not connect to server
Local site: /home/bensoer/Dropbox/BCIT/BTECH/SEM2/COMP8006/Assignments/A3/
```

Mapping

<Filter criteria>					
ID	LOCALPORT	DESTIP	DESTPORT	TYPE	
1 28	4040	localhost	22	TCP	

Port Forwarder

```

Run lib.BackendTestKt
/usr/java/jdk1.8.0_74/bin/java ...
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
NetLibrary - Attempting to Create A TCP Server Socket on port 4040
Select - Registering Server Channel With Select
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 22
NetLibrary - Unable To Access IO: localhost, 22
NetManager - Unable To Connect To Forwarding Server. Terminating Connection
NetManager - Cleanup Complete. We Are Still Running
NetManager - Found A New TCP Connection
NetManager - Now Accepting Connection
NetManager - Connection Accepted
NetManager - Getting Location To The Forwarding Location From Local Port
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Socket To The Forwarding Location
NetLibrary - Attempting to TCP connect to localhost on port 22
NetLibrary - Unable To Access IO: localhost, 22
NetManager - Unable To Connect To Forwarding Server. Terminating Connection
NetManager - Cleanup Complete. We Are Still Running

```

GUI_T1

GUI

Port Forwarder

4040	TCP	->	localhost	:	22
7000	UDP	->	localhost	:	21
Local Port	Protocol	->	IP Address	:	Port Number

Throughput: 0
 Max Throughput:
 Bytes Forwarded:
 Current Connections: — unused — unused
 Max Concurrent Connections:
 Total Connections:

Mapping

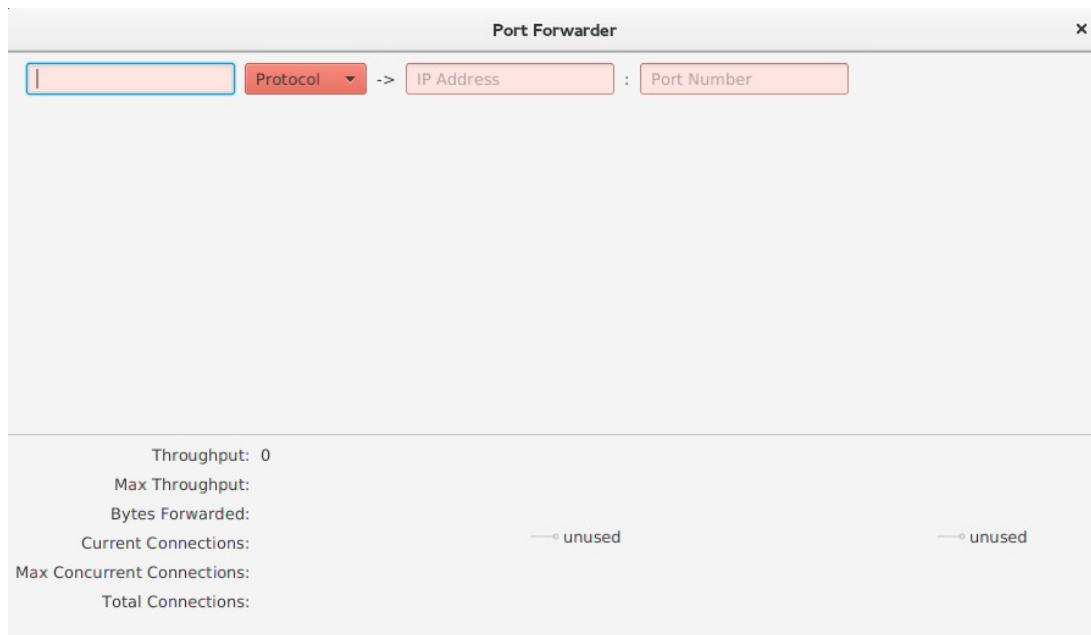
<Filter criteria>					
	ID	LOCALPORT	DESTIP	DESTPORT	TYPE
1	28	4040	localhost	22	TCP
2	29	7000	localhost	21	UDP

Port Forwarder

```
Run main.ApplicationKt
/usr/java/jdk1.8.0_74/bin/java ...
PortForwarder - Initializing Program
SQLitePersistenceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
SQLitePersistenceAdaptor - Connection Succeeded
NetLibrary - Attempting to Create A TCP Server Socket on port 4040
Select - Registering Server Channel With Select
NetLibrary - Attempting to Create A UDP Server Socket on port 7000
Select - Registering Channel With Select
```

GUI_T2

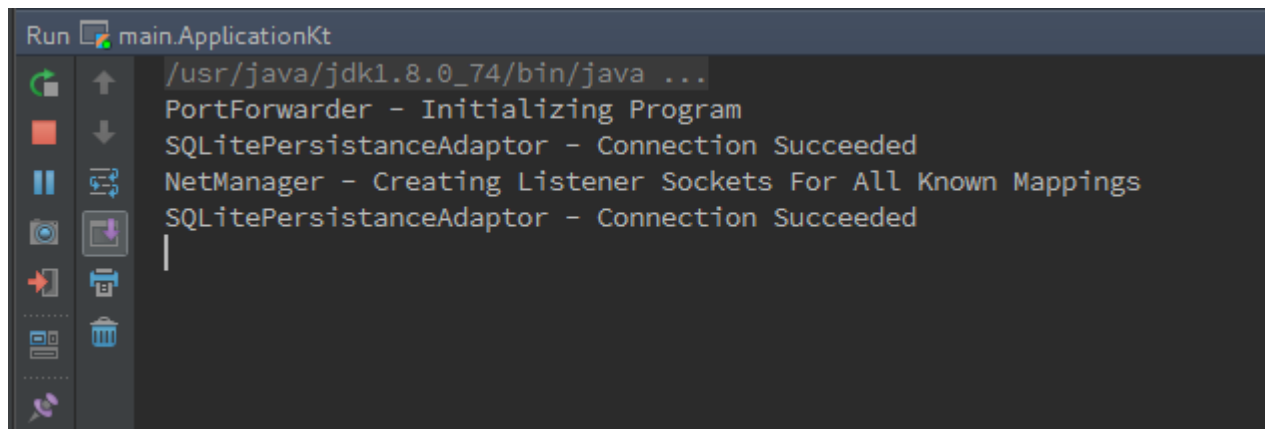
GUI



Mapping

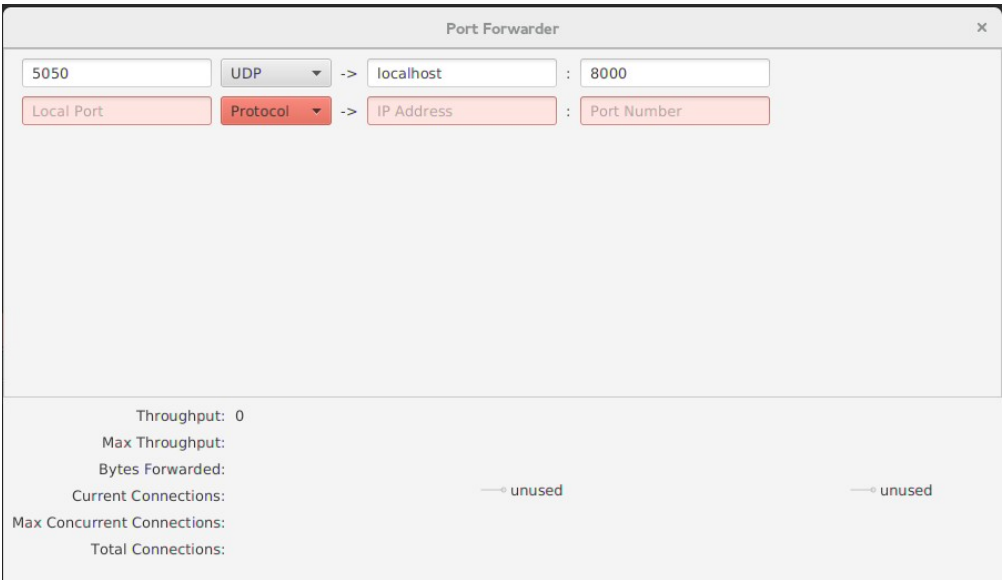


Port Forwarder



GUI_T3

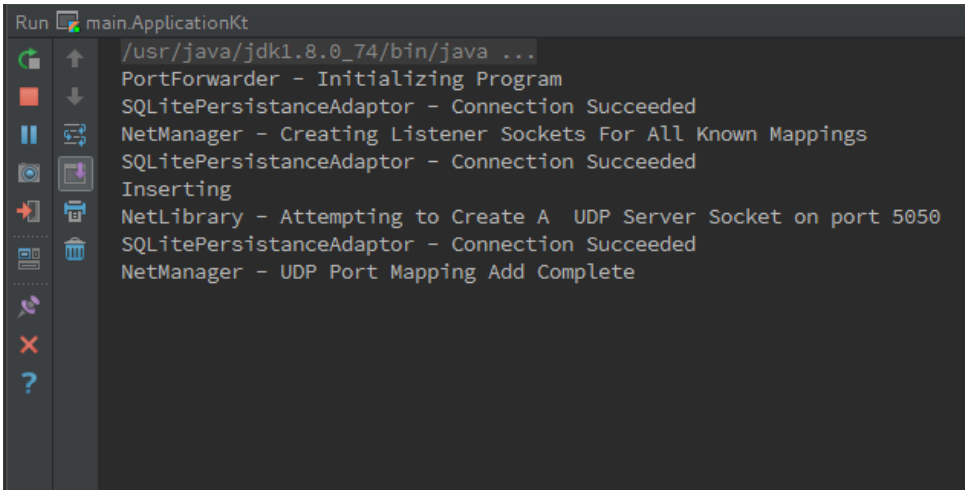
GUI



Mapping

<Filter criteria>					
ID	LOCALPORT	DESTIP	DESTPORT	TYPE	
1 32	5050	localhost	8000	UDP	

Server

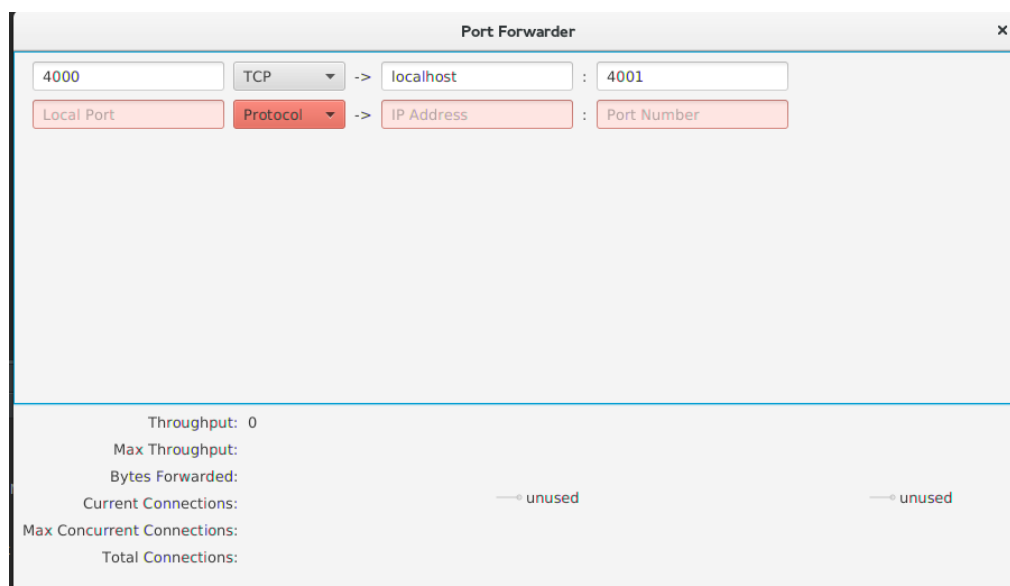


Hping3


```
[bensoer@ironhide ~]$ sudo hping3 localhost -p 5050 --udp
HPING localhost (lo 127.0.0.1): udp mode set, 28 headers + 0 data bytes
^C
--- localhost hping statistic ---
3 packets transmitted, 0 packets received, 100% packet loss
round-trip min/avg/max = 0.0/0.0/0.0 ms
[bensoer@ironhide ~]$
```

GUI_T4

GUI



Mapping

<Filter criteria>					
ID	LOCALPORT	DESTIP	DESTPORT	TYPE	
1 42	4000	localhost	4001	TCP	

Server

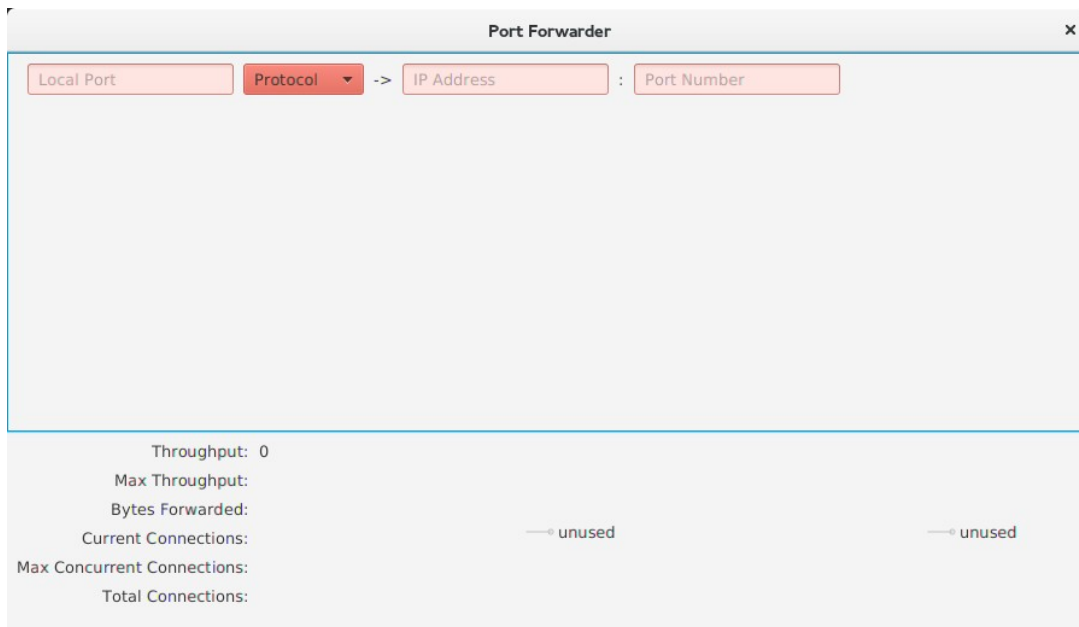
```
Run main.ApplicationKt
/usr/java/jdk1.8.0_74/bin/java ...
PortForwarder - Initializing Program
SQLitePersistanceAdaptor - Connection Succeeded
NetManager - Creating Listener Sockets For All Known Mappings
SQLitePersistanceAdaptor - Connection Succeeded
Inserting
NetLibrary - Attempting to Create A TCP Server Socket on port 4000
SQLitePersistanceAdaptor - Connection Succeeded
Select - Registering Server Channel With Select
NetManager - TCP Port Mapping Add Complete
```

Hping3

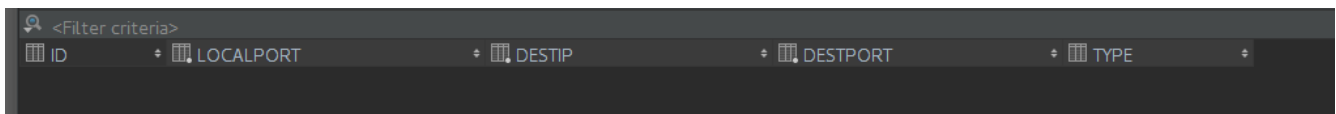
```
[bensoer@ironhide ~]$ sudo hping3 localhost -p 4000 -S
HPING localhost (lo 127.0.0.1): S set, 40 headers + 0 data bytes
len=44 ip=127.0.0.1 ttl=64 DF id=0 sport=4000 flags=SA seq=0 win=43690 rtt=0.1 m
s
len=44 ip=127.0.0.1 ttl=64 DF id=0 sport=4000 flags=SA seq=1 win=43690 rtt=0.2 m
s
len=44 ip=127.0.0.1 ttl=64 DF id=0 sport=4000 flags=SA seq=2 win=43690 rtt=0.3 m
s
len=44 ip=127.0.0.1 ttl=64 DF id=0 sport=4000 flags=SA seq=3 win=43690 rtt=0.2 m
s
^C
--- localhost hping statistic ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 0.1/0.2/0.3 ms
[bensoer@ironhide ~]$
```

GUI_T5

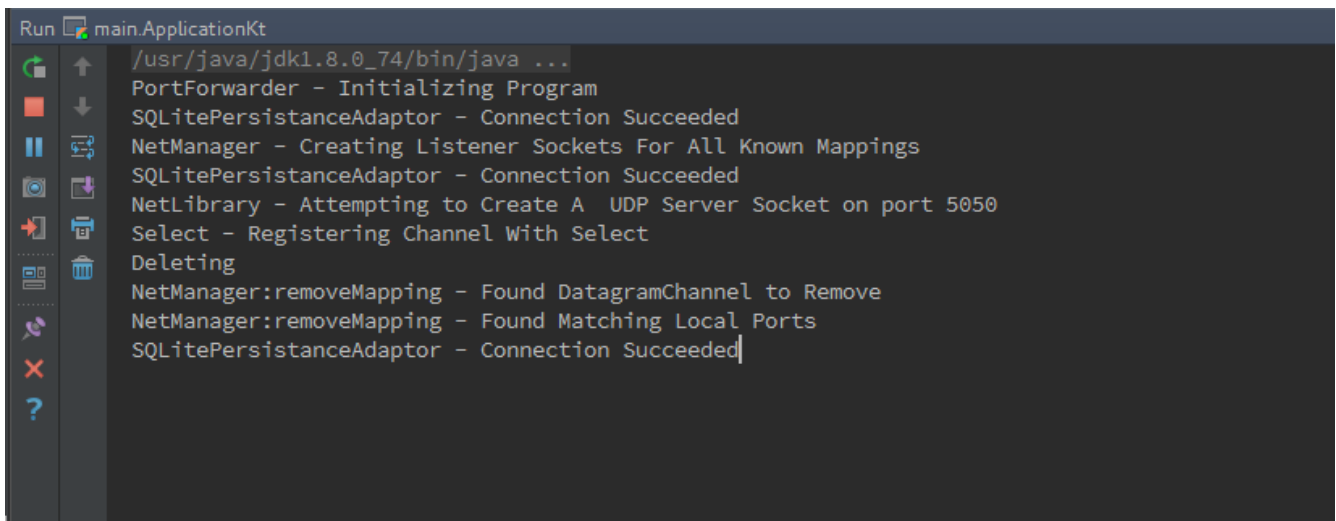
GUI



Mapping



Server

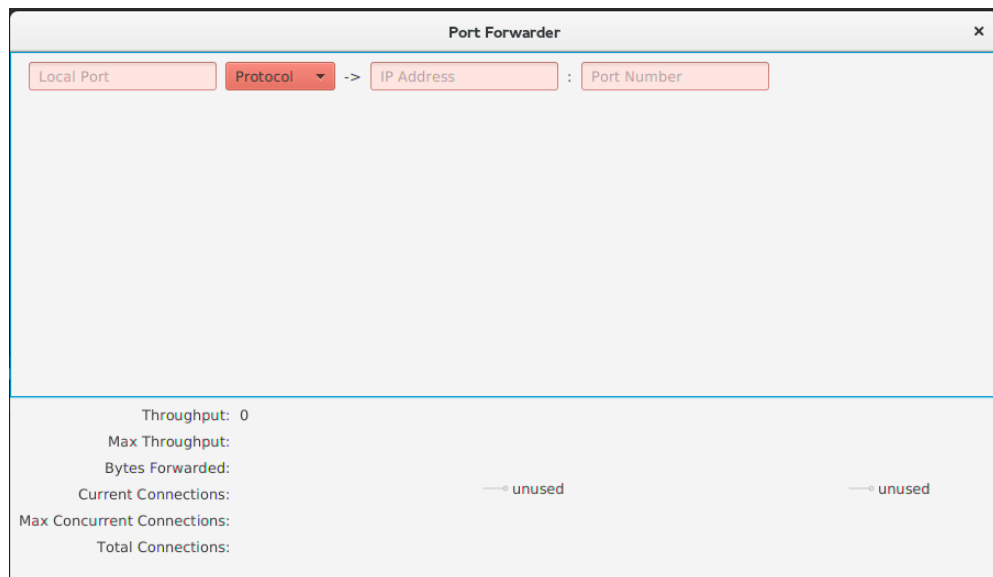


Hping3

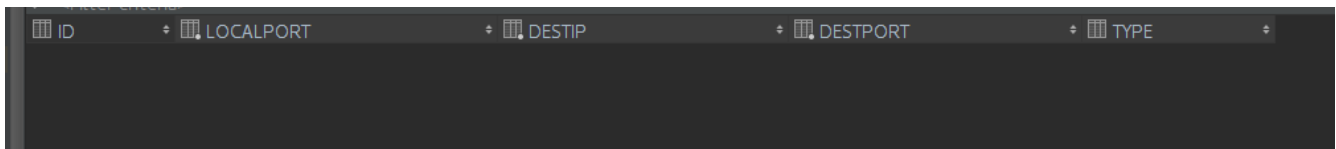
```
[bensoer@ironhide ~]$ sudo hping3 localhost -p 5050 --udp
[sudo] password for bensoer:
HPING localhost (lo 127.0.0.1): udp mode set, 28 headers + 0 data bytes
ICMP Port Unreachable from ip=127.0.0.1 name=localhost.localdomain
ICMP Port Unreachable from ip=127.0.0.1 name=localhost.localdomain
ICMP Port Unreachable from ip=127.0.0.1 name=localhost.localdomain
ICMP Port Unreachable from ip=127.0.0.1 name=localhost.localdomain
^C
--- localhost hping statistic ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 0.0/0.0/0.0 ms
[bensoer@ironhide ~]$
```

GUI_T6

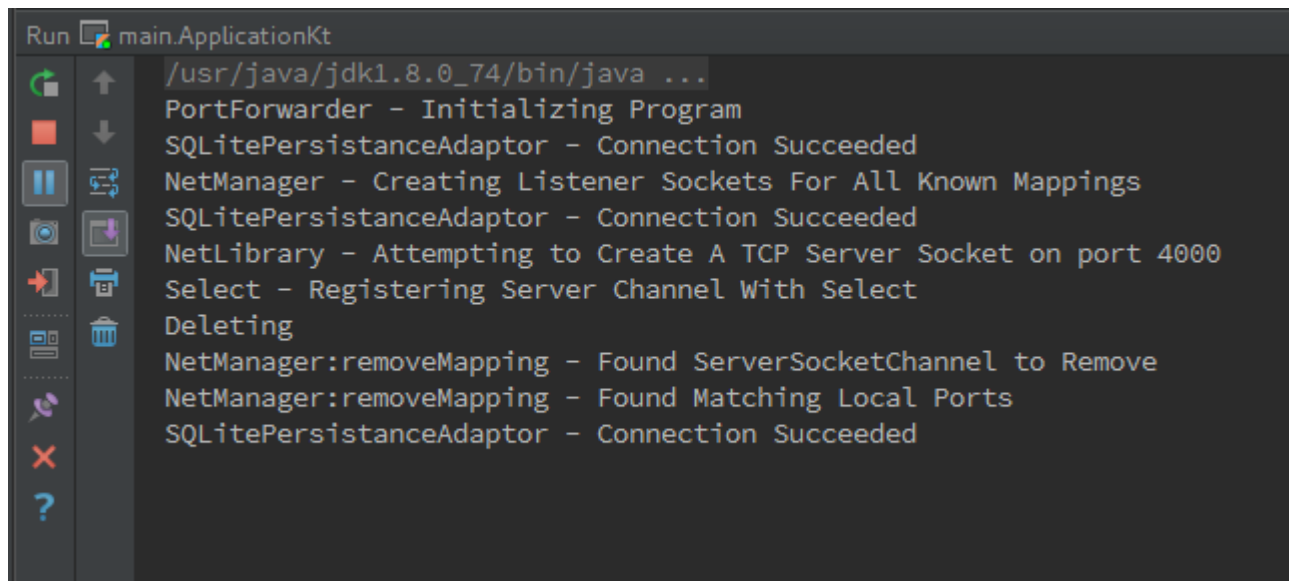
GUI



Mapping



Server



Hping3

```
[bensoer@ironhide ~]$ sudo hping3 localhost -p 4000 -S
HPING localhost (lo 127.0.0.1): S set, 40 headers + 0 data bytes
len=40 ip=127.0.0.1 ttl=64 DF id=44008 sport=4000 flags=RA seq=0 win=0 rtt=0.2 m
s
len=40 ip=127.0.0.1 ttl=64 DF id=44553 sport=4000 flags=RA seq=1 win=0 rtt=0.2 m
s
len=40 ip=127.0.0.1 ttl=64 DF id=45093 sport=4000 flags=RA seq=2 win=0 rtt=0.2 m
s
len=40 ip=127.0.0.1 ttl=64 DF id=45430 sport=4000 flags=RA seq=3 win=0 rtt=0.1 m
s
^C
--- localhost hping statistic ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 0.1/0.2/0.2 ms
[bensoer@ironhide ~]$
```