Cryptography

> DAT159

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Task 1

After setting up the certificate, the connection works.

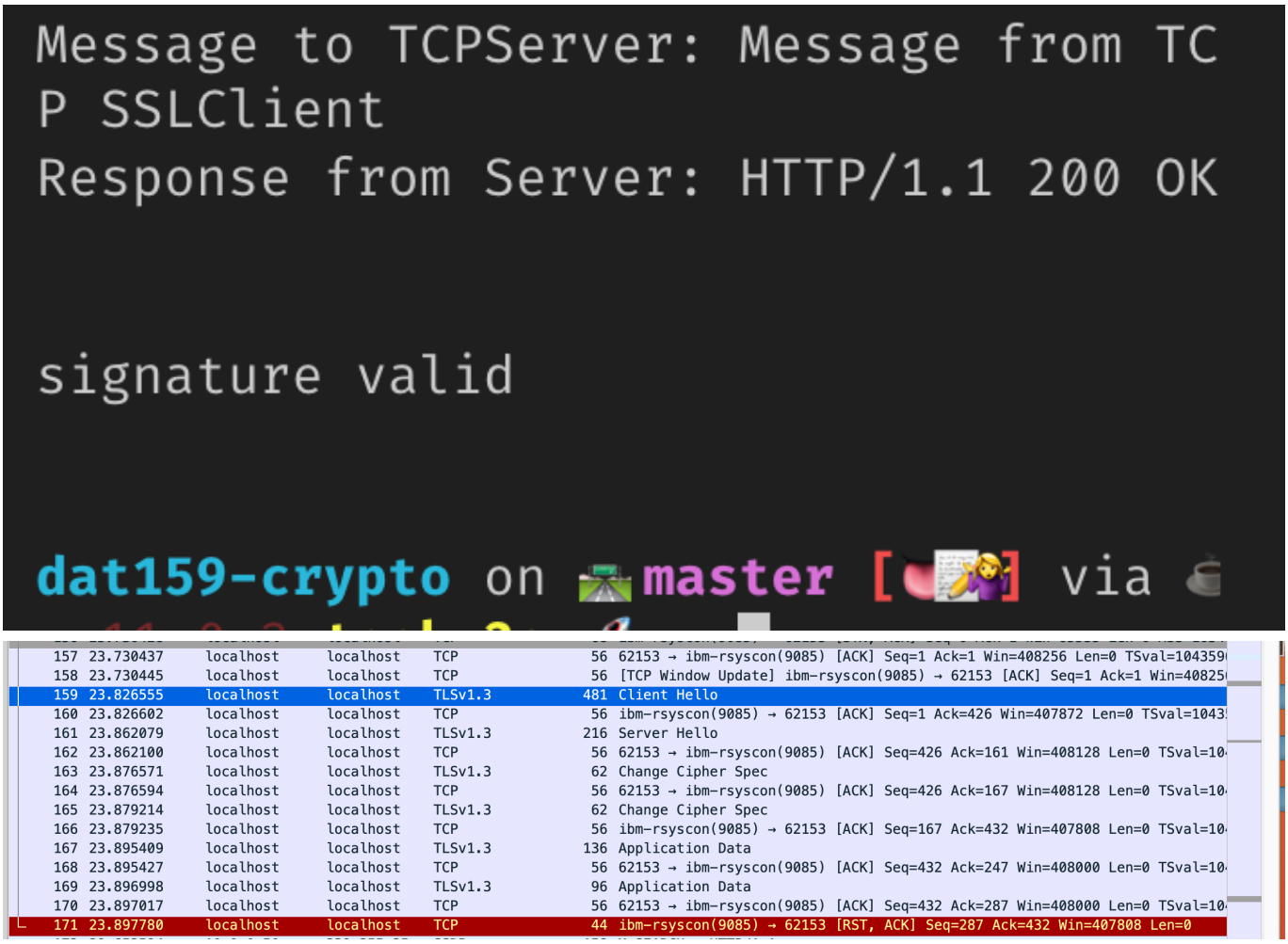
```
Message to TCPServer: Message from TC
P SSLClient
Response from Server: HTTP/1.1 200 OK
```

```
Run | Debug
public static void main(String[] args) throws InvalidKeyException, NoSuchAlgorithmExce
        NoSuchPaddingException, UnrecoverableKeyException, KeyStoreException {
    // Set the truststore dynamically using the system property

    System.setProperty("javax.net.ssl.trustStore", "keys/tcp_truststore");
    System.setProperty("javax.net.ssl.trustStorePassword", "abcdef");

    String message = "Message from TCP SSLClient";
    TCPClientSSLRSA c = new TCPClientSSLRSA(ServerConfig.SERVER, ServerConfig.PORT);
    c.clientProcess(message);
}
```

```
3972 99.315022    localhost    localhost    TLSv1.3      481 Client Hello
3973 99.315047    localhost    localhost    TCP           56 ibm-rsyscon(9085) → 53127 [ACK] Seq=1 Ack=426 Win=407872 Len=0 TSval=114092558
3974 99.370974    localhost    localhost    TLSv1.3      216 Server Hello
3975 99.371001    localhost    localhost    TCP           56 53127 → ibm-rsyscon(9085) [ACK] Seq=426 Ack=161 Win=408128 Len=0 TSval=1140925
3976 99.384994    localhost    localhost    TLSv1.3       62 Change Cipher Spec
3977 99.385018    localhost    localhost    TCP           56 53127 → ibm-rsyscon(9085) [ACK] Seq=426 Ack=167 Win=408128 Len=0 TSval=1140925
3978 99.387538    localhost    localhost    TLSv1.3       62 Change Cipher Spec
3979 99.387555    localhost    localhost    TCP           56 ibm-rsyscon(9085) → 53127 [ACK] Seq=167 Ack=432 Win=407808 Len=0 TSval=1140925
3980 99.400944    localhost    localhost    TLSv1.3      136 Application Data
3981 99.400962    localhost    localhost    TCP           56 53127 → ibm-rsyscon(9085) [ACK] Seq=432 Ack=247 Win=408000 Len=0 TSval=1140925
3982 99.403963    localhost    localhost    TLSv1.3     1004 Application Data
3983 99.403978    localhost    localhost    TCP           56 53127 → ibm-rsyscon(9085) [ACK] Seq=432 Ack=1195 Win=407104 Len=0 TSval=114092
3984 99.464908    localhost    localhost    TLSv1.3      358 Application Data
3985 99.464934    localhost    localhost    TCP           56 53127 → ibm-rsyscon(9085) [ACK] Seq=432 Ack=1497 Win=406784 Len=0 TSval=114092
```

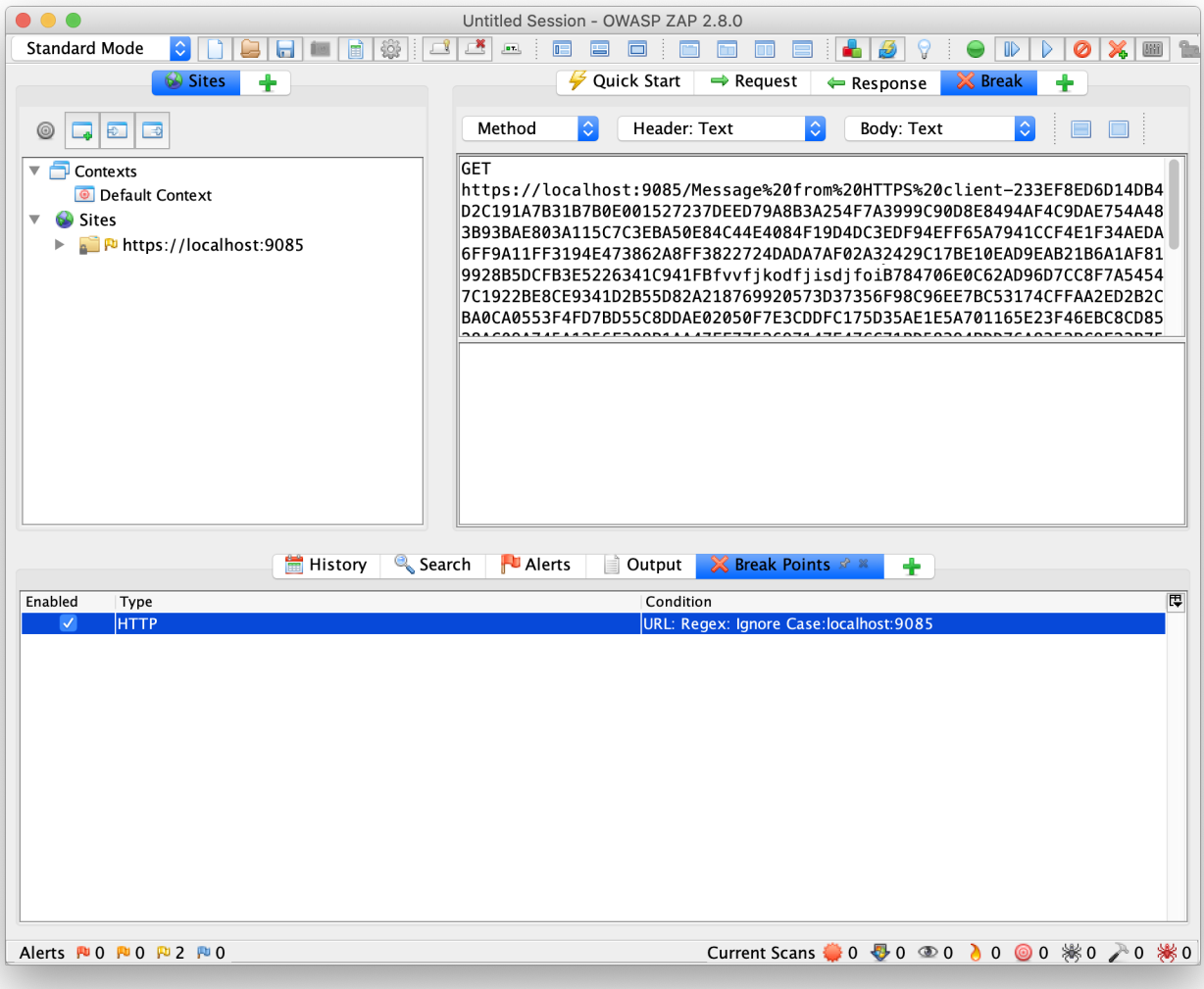
Task 3

Here is the result in WireShark.

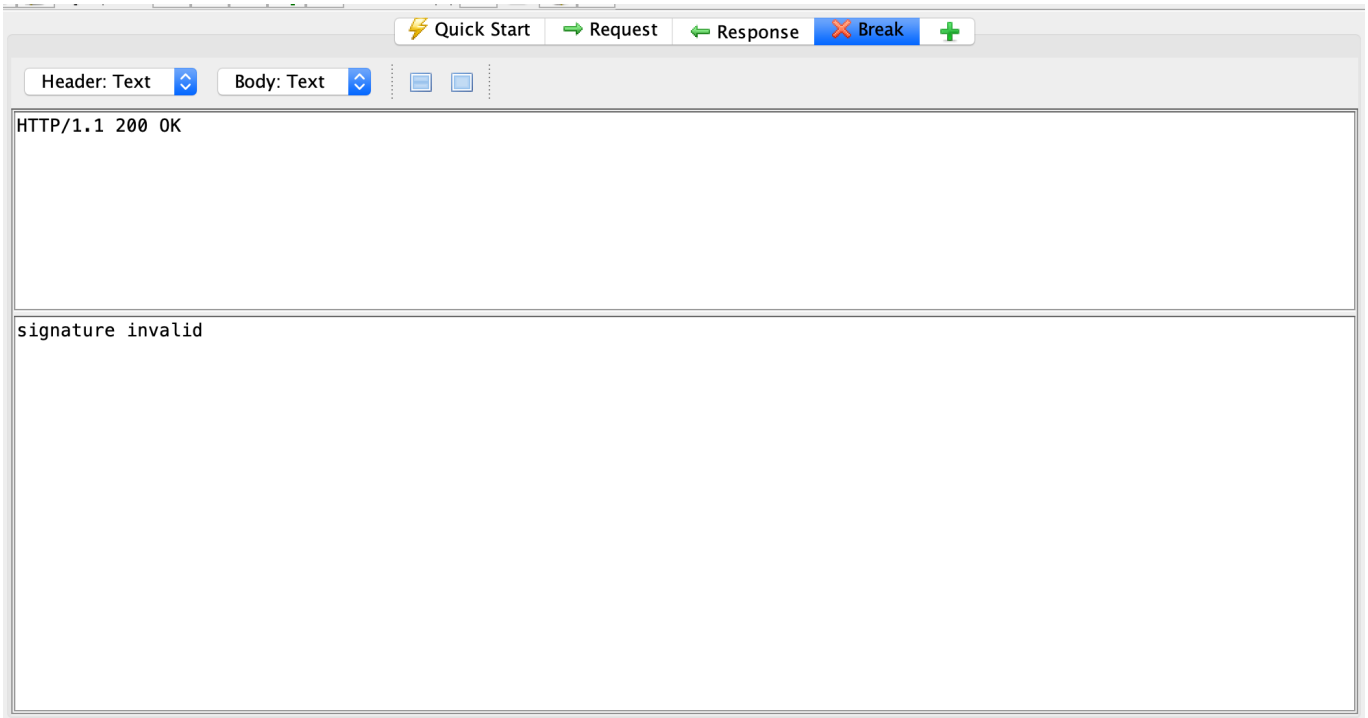


Task 4 | Tamper with the Message (Integrity)

After setting up the proxy certificates, we've set a breakpoint like this:



After tampering with the message this is the response from the server.



Question

Can we impersonate HttpsClientProxySSLRSA in this setup? If so, we would need it's private key in order to sign messages correctly.