z/TPF V1.1

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WebSphere MQ

Support for SSL PJ34481

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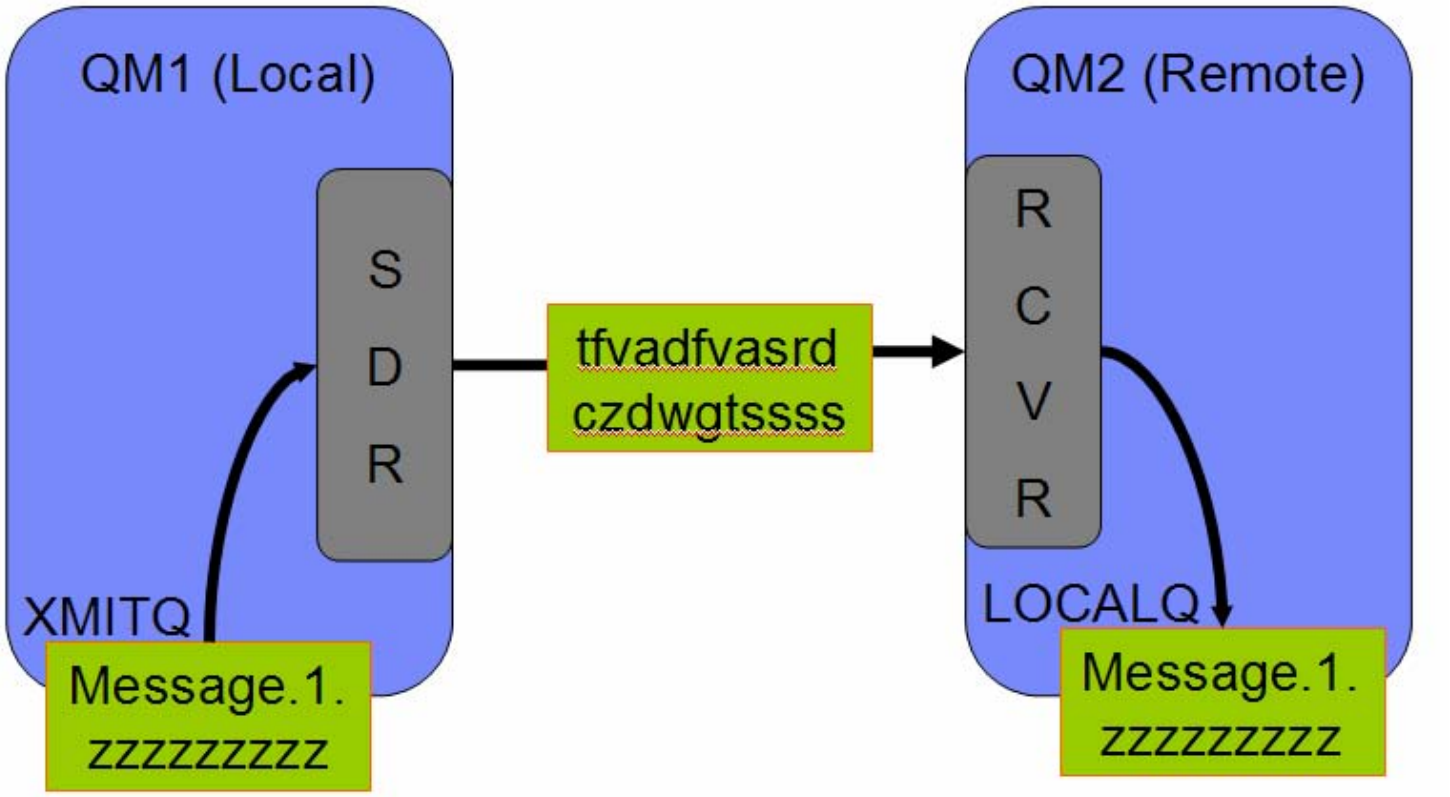
Overview z/TPF WebSphere MQ support for SSL

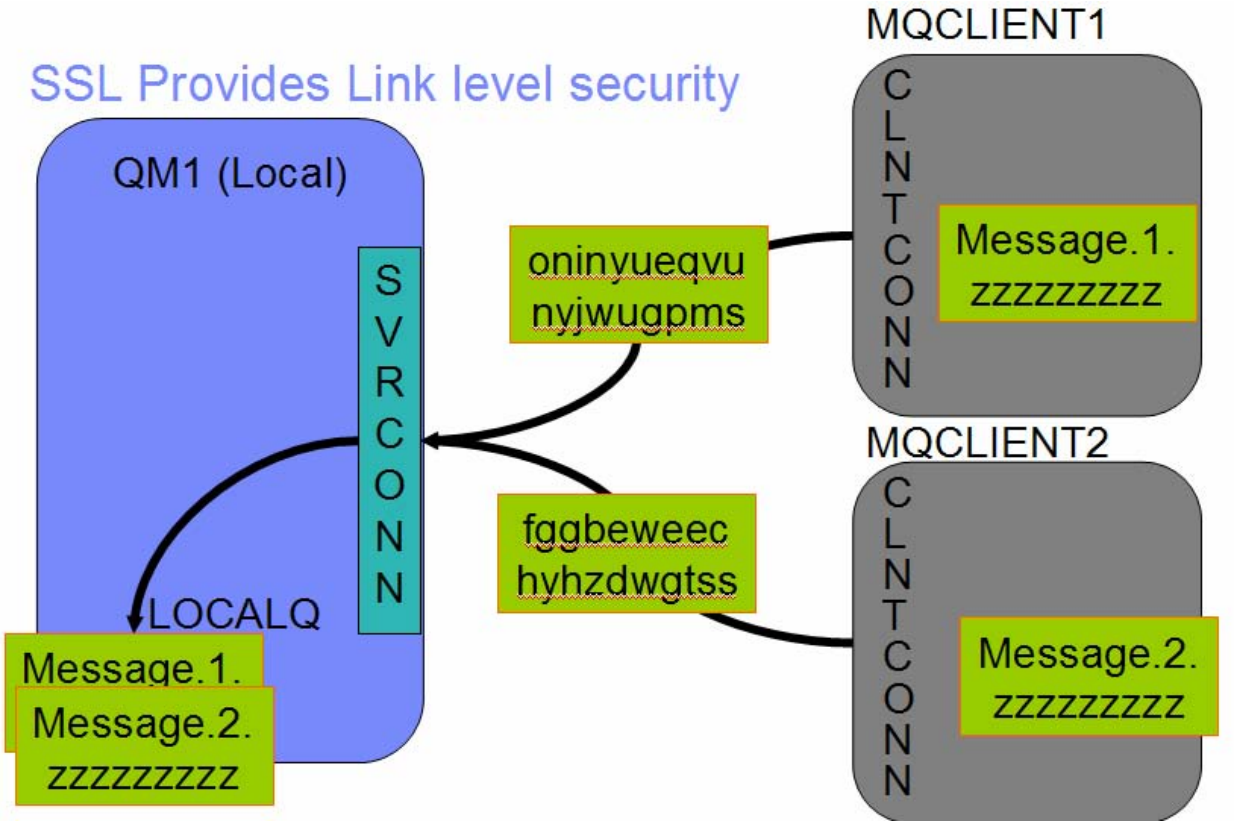
- Provide Link level security between WebSphere MQ and z/TPF WebSphere MQ
  - **SSL QMGR to QMGR, (RCVR/SDR Channels)**
    - **z/TPF to z/TPF**
    - **z/TPF to any other SSL enabled WebSphere MQ Platform**
  - **SSL Server support (SVRCONN Channels**
  - **z/TPF MQ Client not supported (ZMQID)**
- Requirement MQ04006, SSL Channels
- Makes use of z/TPF Shared SSL support
- Uses z/TPF Application configuration files for SSL
  - Used by middleware such as FTPC and HTTP
- PJ34481 has not been released yet and is subject to change.

Benefits of z/TPF WebSphere MQ SSL

- **Message Encryption during transport**
  - Supports a range of cryptographic algorithms
- **Message Integrity Checking**
- **Authentication**
  - Uses Public/Private Keys
  - Allows the checking of the Distinguished Name (DN) (SSLPEER)
  - Optional client authentication (SSLCAUTH)

SSL Provides Link level security





Channel Attributes

- **SSL (YES/NO/FILE)**
  - Whether the channel should use SSL (YES/NO) or the value contained in the application configuration file for SSL (FILE)
- **SSLCONF (*filename*.conf)**
  - Override the default Application configuration file for SSL
- **SSLCAUTH (REQUIRED/OPTIONAL)**
  - RCVR/SVRCONN channels only
  - Whether the SSL server requires the SSL client to send its digital certificate for authentication.

Queue Manager Attributes

- **SSLRKEYC (default “0” no renegotiation)**
  - The total number of unencrypted bytes that are sent and received within an SSL conversation before the secret key is renegotiated. The number of bytes includes control information.
- **SSLEVENT (ENABLED/DISABLED)**
  - Allows SSLEVENTS to be written to the SYSTEM.ADMIN.CHANNEL.EVENT queue if defined.

Application configuration files for z/TPF WebSphere MQ SSL

- Config files TPF unique way to save application OpenSSL values
- CIPHER, CAINFO, CAPATH, CERTIFICATE, CERTTYPE, KEY, KEYTYPE
  - Same as other middleware (FTPC/HTTP)
- USESSL=**YES/NO**
  - **TRY** not supported with z/TPF WebSphere MQ SSL support
- VERSION=**SSLV2/SSLV3/TLSV1**
  - **SSLV23** not supported with z/TPF WebSphere MQ SSL support
- VERIFYPEER=**YES/NO**
  - Changed from **0/1/2** with z/TPF WebSphere MQ SSL support
  - FTPC and HTTP will be changed to support this
- APPLDATA=
  - New for z/TPF WebSphere MQ SSL support for **SSLPEER**

Application configuration files for z/TPF WebSphere MQ SSL (cont'd)

- SSLPEER (appldata=*SSLPEER-*)
  - The Distinguished Name pattern that WebSphere MQ uses to decide the entities from which messages are accepted. The SSLPEER pattern filters the Distinguished Names of the entities.
  - Example:

    appldata=SSLPEER-CN=jfmuller,O=TPF,C=US

Example application configuration file for SSL

/etc/ssl/mq/mq.conf

```
# z/TPF WebSphere MQ for SSL example
usessl=yes
version=sslv3
cipher=NULL-MD5
verifypeer=yes
cainfo=/certs/cacert.pem
certificate=/certs/cert.pem
certtype=pem
key=/certs/key.pem
keytype=pem
appldata=SSLPEER-CN=jfmuller,O=TPF,C=US
```

Channel usage of Application configuration file

- **SDR channels**
  - default is /etc/ssl/mq/mq.conf
  - Override with the SSLCONF channel parameter
  - For example SSLCONF-"ch1" results in /etc/ssl/mq/ch1.conf
    - Use " " if lowercase is needed.
- **RCVR/SVRCONN channels**
  - SSL handshake uses /etc/ssl/mq/mq.conf
  - Since the SSL Handshake is done before we know the channel name.
  - Once the channel name is known the SSLCONF channel parameter is used to determine the override file to verify the connection settings. (Using correct cipher, version, etc.)

Change required to z/TPF WebSphere MQ INETD

- **WebSphere MQ uses a single port for all traffic SSL/non-SSL**
- **Current listener MQS, uses activate_on_receipt_with_length()**
  - s-mqs pgm-cmql model-aor p-tcp aorl-8 port-1414
- **A new model was needed so that we can peek at the data and determine SSL or non-SSL traffic using activate_on_accept()**
- **Procedure for applying PJ34481**
  - Define the new listener (MQAOA)
    - zinet add s-mqaoa pgm-cmql model-aoa2 p-tcp port-1414
  - Required regardless of the use of SSL or non-SSL

Migration

- **All existing and new definitions will default to not using SSL**
- **Converting existing channels to use SSL**
  - SDR/RCVR channel pairs
    - Both channel definitions will need to be modified to use SSL, and then restarted.
  - SVRCONN channels
    - Once the channel is altered to use SSL all new clients must use SSL in order to connect. New non-SSL connections will fail.
- **Ways to migrate client connections**
  - Define a new SVRCONN channel and convert clients to the new channel.
  - Enable SSL and force all clients to be changed to use SSL

z/TPF WebSphere MQ Minimum Setup

- **Ensure SSL Server side has a certificate. (RCVR/SVRCONN).**
- **Ensure an Application configuration file for SSL (/etc/ssl/mq/mq.conf) is created with the correct parameters specified. (CERTIFICATE, CIPHER, VERSION, etc.)**
- **Ensure channel has been modified to use SSL.**
- **Start the channel.**

SSL Daemon process control

- Shared SSL provides a load balancing mechanism by specifying which daemon processes an application can use through **/etc/sslshared.txt**
- The default for MQ is “MQ ALL” if there is no entry in /etc/sslshared.txt
- For Example:

  “MQ 2,3” will use daemon process two and three.

Conclusion

- z/TPF WebSphere MQ provides a mechanism to secure your channels that is integrated into the product.
- Does not involve any changes to your MQ applications in order to use
- Set up as part of your channel configuration and provides a built in mechanism to address
  - Eavesdropping
  - Tampering
  - Impersonation
- Uses a well known and extensively tested security protocol. (OpenSSL)

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