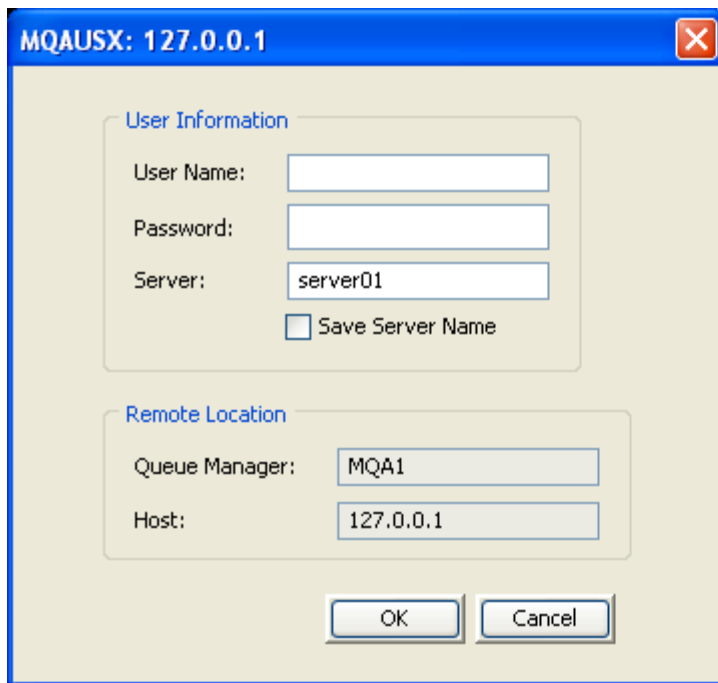


MQAUSX for z/OS Server-side Installation and Operation Manual



A screenshot of a Windows-style dialog box titled "MQAUSX: 127.0.0.1". The dialog is divided into two sections: "User Information" and "Remote Location".


User Information:

- User Name: []
- Password: []
- Server: [server01]
- Save Server Name

Remote Location:

- Queue Manager: [MQA1]
- Host: [127.0.0.1]

At the bottom are "OK" and "Cancel" buttons.



Authenticate User
Security Exit



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1 Introduction

1.1 Overview

MQ Authenticate User Security Exit for z/OS (z/MQAUSX) is a new solution that allows a company to fully authenticate a user who is accessing a WebSphere MQ resource. It verifies the User's UserId and Password against the z/OS server's native OS system.

The security exit will operate with WebSphere MQ v5.3.1, v6.0 and v7.0 in z/OS v1.4 or higher environments. It works with Server Connection, Client Connection, Sender, Receiver, Server, Requestor, Cluster-Sender and Cluster-Receiver channels of WebSphere MQ queue manager.

The MQ Authenticate User Security Exit for z/OS solution is comprised of 2 components: client-side security exit and server-side security exit.

1.1.1 Client-Side Security Exit

The *client-side security exit* first checks if the server-side exit is defined for the particular channel. The client-side exit will receive a 128-bit security token to be used in the encryption process of the user's password. It will prompt the user for his / her UserId and Password (and domain name for Windows), encrypt the data and send it to the server-side security exit.

For each connection attempt, the server-side security exit will verify that it is an acceptable client exit attempting the connection. If so, then the server-side will send a unique 128-bit security token. When the server-side security exit receives the encrypted data, it will decrypt the incoming data and then perform UserId and Password (and domain) verification against the native OS (or file - optional). If successful, the connection will be allowed.

If the company or MQ Administrator chooses not to use native OS UserId and Password checking, he or she can set up the server-side security exit to use a file for UserId and Password checking. The file is a plain text file where each row will contain 2 columns: UserId and Password. Any standard text editor can be used to modify the file.

1.1.2 Server-Side Security Exit

The *server-side security exit* supports the concept of 'Proxy IDs'. After a user has been successfully validated against the native z/OS or file based validation data and the 'Proxy Mode' flag is set, then the server-side security exit will look up the user's UserID in the Proxy file for their Proxy ID. The Proxy ID will be used for all MQ interactions.

The server-side security exit has the ability to allow or restrict users from logging in with the 'CHIN' or the CHIN's Started-task UserIds. This is controlled by the server-side security exit's property keyword 'Allowmqm'.

The server-side security exit has the capability to allow or limit the incoming channel connections according to the name of the associated Server Connection channel (SVRCONN).

Each Server Connection channel can be allocated a maximum number of connections and the server-side security exit will ensure that this maximum is not exceeded.

Client connections to a queue manager are limited by either channel name or the 'DefaultMCC' property keyword in the initialization file. In today's use of J2EE applications, it is a possibility that one J2EE application could overwhelm the queue manager with client connections, thus preventing any connections being made from other applications.

The server-side security exit has the ability to allow or restrict the incoming IP address and/or SSL DN. The server-side security exit uses a regular expression parser to parse the incoming client IP address and/or SSL DN against a predefined regular expression pattern.

For those channels where authentication is not required, the server-side security exit can be set to not perform this function. This is controlled by the server-side security exit's property keyword 'NoAuth'.

The server-side security exit, when in non-authentication mode, has the ability to allow or restrict users from connecting with a blank UserID value. This is controlled by the server-side security exit's property keyword 'AllowBlankUserID'.

The server-side security exit, when in non-authentication mode, has the ability to allow or restrict the incoming UserID. The server-side security exit uses a regular expression parser to parse the incoming client UserID against a predefined regular expression pattern.

1.2 Executive Summary

The *MQ Authenticate User Security Exit for z/OS* solution is comprised of 2 components: client-side security exit and server-side security exit.

1.2.1 Server-Side Security Exit

The server-side security exit is available in 2 forms:

- z/OS load-module

The major features of the server-side security exit are as follows:

- Authenticate a user against the server's native z/OS or a z/MQAUSX file.
- Provides support for Proxy UserIDs
- Allows or restricts the incoming IP address against a regular expression pattern
- Allows or restricts the incoming SSL DN against a regular expression pattern
- Limit the number of incoming channel connections on a SVRCONN channel.
- Allows or restricts the use of 'CHIN' or the CHIN's Started-task UserIds
- Ability to turn off server-side authentication
- Allows or restricts the incoming UserID against a regular expression pattern when authentication is off
- Provides logging capability for all connecting client applications regardless if they were successful or not.
- Provides logging capability via Write To Operator (WTO) facility.

1.2.2 Client-Side Security Exit

The client-side security exit is available in 3 forms:

- Windows DLL,
- Java JAR and
- Non-GUI shared library for AIX, HP-UX, Linux, and Solaris.

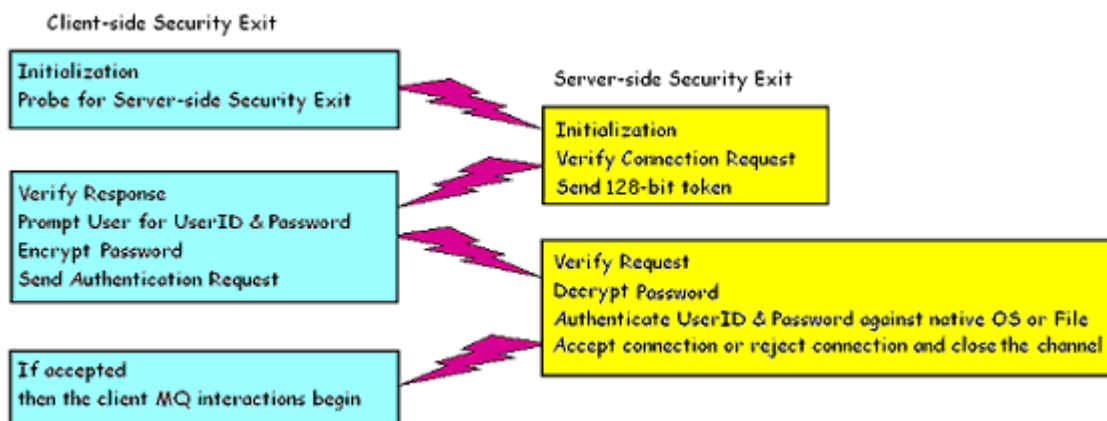
The client-side security exit has been tested against the following MQ client programs:

- IBM's MQ Explorer v5.2, v5.3 and v6.0
- SupportPac MO71 (MQMon)
- IBM's WBIMB Eclipse Tool Kit
- Mercury's SiteScope
- Capitalware's MQ Visual Edit
- Capitalware's MQ Visual Browse
- Capitalware's MQ Batch Toolkit
- Any program that uses Client Channel Tables (i.e. SupportPac MS03, WatchQ, etc.)
- J2EE web server (i.e. WebLogic, WebSphere, etc.)

1.3 Context Diagram (Logical View)



1.4 Security Message Flow (Logical View)



1.5 Prerequisites

This section provides the minimum supported software levels. These prerequisites apply to both client-side and server-side installations of MQ Authenticate User Security Exit for z/OS.

1.5.1 Operating System

MQ Authenticate User Security Exit for z/OS can be installed on any of the following supported servers:

1.5.1.1 IBM z/OS

- IBM z/OS v1.4 or higher

1.5.2 WebSphere MQ

- WebSphere MQ for z/OS v5.3.1, v6.0 and v7.0

2 Installing MQ Authenticate User Security Exit for z/OS

This section describes how to install Capitalware's MQ Authenticate User Security Exit for z/OS.

2.1 Server-side Security Exit

The following files are the platform specific server-side security exits and the required initialization file (IniFile):

2.1.1 z/OS Installation

To install the MQAUSX for z/OS, first unzip the **mqausx_zos-setup.zip**. The zip file contains 2 z/OS XMIT prepared datasets.

- **MQAUSX.LOAD.ZOS** is the XMIT dataset that contains the z/OS load-module.
- **MQAUSX.SYSIN.ZOS** is the XMIT dataset that contains a sample initialization file for the server-side security exit and sample MQSC script to define MQ channels with the security exits.

Steps to install the server-side security exit:

1. ftp the z/OS XMIT prepared datasets to the z/OS LPAR.

```
ftp -s:mqausx.ftp z/OS_hostname
```

```
your-z/OS-userid  
your-z/OS-password  
  
binary  
quote SITE recfm=fb lrecl=80 blksize=3120  
put MQAUSX.LOAD.ZOS  
put MQAUSX.SYSIN.ZOS  
quit
```

If the user receives the following error message then they will need to pre-allocate the z/OS datasets:

```
ftp> put MQAUSX.LOAD.ZOS  
200 Port request OK.  
550-SVC99 RETURN CODE=4 S99INFO=0 S99ERROR=38656 HEX=9700 S99ERSN code X'000003F3'.  
550 Unable to create data set xxxxx.MQAUSX.LOAD.ZOS for STOR command.  
ftp> put MQAUSX.SYSIN.ZOS  
200 Port request OK.  
550-SVC99 RETURN CODE=4 S99INFO=0 S99ERROR=38656 HEX=9700 S99ERSN code X'000003F3'.  
550 Unable to create data set xxxxx.MQAUSX.SYSIN.ZOS for STOR command.
```

To pre-allocating the XMIT datasets go to option 3.2 of ISPF and allocate both datasets: MQAUSX.LOAD.ZOS and MQAUSX.SYSIN.ZOS.

Use the following dataset attributes when allocating both datasets:

Space	
Units	BLOCKS
Primary Quantity	40
Secondary Quantity	40
Directory Blocks	0
DCB Parameters	
RECFM	FB
LRECL	80
BLKSIZE	3120
DsnType	Blank

After the user has pre-allocated the datasets, they can redo the ftp commands.

2. Log on to z/OS LPAR and issue the following TSO RECEIVE commands:

```
TSO RECEIVE INDATASET(MQAUSX.LOAD.ZOS)
TSO RECEIVE INDATASET(MQAUSX.SYSIN.ZOS)
```

After issuing the above commands, the following product datasets will appear:

- **+HLQ+.CPTLWARE.MQAUSX.LOAD** is the dataset that contains the z/OS load-module.
- **+HLQ+.CPTLWARE.MQAUSX.SYSIN** is a dataset that contains a sample initialization file for the server-side security exit and sample MQSC script to define MQ channels with the security exits.

2.1.2 z/MQAUSX DataSets

z/MQAUSX solution is comprised of 2 datasets: +HLQ+.CPTLWARE.MQAUSX.LOAD and +HLQ+.CPTLWARE.MQAUSX.SYSIN.

2.1.2.1 +HLQ+.CPTLWARE.MQAUSX.LOAD

- **MQAUSX** is the actual security exit z/OS load-module that will be invoked by the MQ Server component.

2.1.2.2 +HLQ+.CPTLWARE.MQAUSX.SYSIN

- **MQAUSXIN** is a sample initialization file for the server-side security exit.
- **AUSXMQSC** is a sample MQSC script to define MQ channels with the security exits.

2.1.3 z/OS CHIN JCL

This section describes the required JCL for z/MQAUSX.

2.1.3.1 CSQXLIB DDName

The MQAUSX load-module needs to be put in the executable path for the CHINIT started-task. There are 2 options for achieving this:

1. Add the dataset to the CSQXLIB concatenation of the CHINIT's CSQXLIB.

```
//CSQXLIB DD DISP=SHR,DSN=+MQHLQ+. +QMGRNAME+. USERAUTH  
// DD DISP=SHR,DSN=+HLQ+. CPTLWARE.MQAUSX.LOAD
```

2. Copy the MQAUSX load-module to your existing MQ exit / link-edited parameter dataset. Here is a sample JCL to copy the MQAUSX load-module:

```
//COPY1 EXEC PGM=IEBCOPY,REGION=1024K  
//SYSPRINT DD SYSOUT=*  
//SYSUT3 DD DSN=&&SYSUT3,UNIT=SYSDA,DISP=(,DELETE),  
// SPACE=(CYL,(5,1))  
//SYSUT4 DD DSN=&&SYSUT4,UNIT=SYSDA,DISP=(,DELETE),  
// SPACE=(CYL,(5,1))  
//*  
//IN DD DISP=SHR,DSN=+HLQ+. CPTLWARE.MQAUSX.LOAD  
//*  
//OUT DD DISP=SHR,DSN=+MQHLQ+. +QMGRNAME+. USERAUTH  
//*  
//SYSIN DD *  
COPYMOD OUTDD=OUT,INDD=((IN,R))  
S M=MQAUSX  
/*
```

2.1.3.2 MQAUSXIN DDName

MQAUSXIN is the DDName that points to a dataset containing the IniFile parameters.

Add the following line to the CHINIT's JCL.

```
//MQAUSXIN DD DISP=SHR,DSN=+HLQ+. CPTLWARE.MQAUSX.SYSIN(MQAUSXIN)
```

2.1.3.3 PROXY DDName - Optional

PROXY is the DDName that points to a dataset containing the UserId proxy values.

Add the following line to the CHINIT's JCL.

```
//PROXY DD DISP=SHR,DSN=+HLQ+.CPTLWARE.MQAUSX.PROXY
```

To allocate the PROXY dataset go to option 3.2 of ISPF and allocate a dataset using the following dataset attributes:

Space	
Units	BLOCKS
Primary Quantity	40
Secondary Quantity	40
Directory Blocks	0
DCB Parameters	
RECFM	FB
LRECL	80
BLKSIZE	27920
DsnType	Blank

See section 4.12 for more information on the use of Proxy UserIds.

2.1.3.4 FBAFile DDName - Optional

FBAFILE is the DDName that points to a dataset containing the UserId and Password values.

Add the following line to the CHINIT's JCL.

```
//FBAFILE DD DISP=SHR,DSN=+HLQ+.CPTLWARE.MQAUSX.FBAFILE
```

To allocate the FBAFILE dataset go to option 3.2 of ISPF and allocate a dataset using the following dataset attributes:

Space	
Units	BLOCKS
Primary Quantity	40
Secondary Quantity	40
Directory Blocks	0
DCB Parameters	
RECFM	FB
LRECL	80
BLKSIZE	27920
DsnType	Blank

See section 5.9 for more information on the use of FBA UserId and Password values.

2.1.4 MQAUSX-ISPF-GUI for z/OS Installation

Read section 2 of the *MQAUSX-ISPF-GUI for z/OS User Guide* for information on the installation process.

2.2 Client-side Security Exit

For more information, please read the *MQAUSX Client-side Configuration* Manual.

3 Security Configuration

This section describes the necessary steps to enable the server-side security exit to perform the UserId and Password verification. The server-side security exit will work with WebSphere MQ v5.3.1, v6.0, v7.0 or higher.

3.1 z/OS Security Configuration

This section describes how to configure z/OS to allow the server-side security exit to perform the UserId and Password authentication.

The following RACF commands need to be executed on z/OS to allow z/MQAUSX to authenticate the UserId and Password against z/OS:

```
RALTER PROGRAM * ADDMEM(' +MQHLQ+.SCSQAUTH' //NOPADCHECK)
RALTER PROGRAM * ADDMEM(' +HLQ+.CPTLWARE.MQAUSX.LOAD' //NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM(' SYS1.SCSQANLE' //NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM(' SYS1.SCSQAUTH' //NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM(' SYS1.SCSQLINK' //NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM(' SYS1.SCSQLOAD' //NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM(' SYS1.SCSQMVR1' //NOPADCHK) UACC(READ)
RALTER PROGRAM * ADDMEM(' SYS1.SCSQSNLE' //NOPADCHK) UACC(READ)
SETROPTS WHEN(PROGRAM) REFRESH
```

4 Configuring Server-side Security Exit

This section describes how to configure the server-side security exit.

4.1 Security User Data (SCYDATA)

MQAUSX supports 2 ways to specify an IniFile via the Security User Data (SCYDATA) field: DD Name and DD Name with a Member Name.

4.1.1 SCYDATA with DD Name

In this case, only the DD Name is used to specify the IniFile. The DD Name provided in the SCYDATA field must match the DD Name in the CHIN's JCL. The DD statement's DSN keyword can contain either a fully qualified Partition DataSet with the Member name or a Sequential DataSet.

4.1.1.1 SCYDATA with DD Name using Partition DataSet

The CHIN's DD Name references the DSN keyword which contains the fully qualified Partition DataSet Name (highlighted in **red**) and member name (highlighted in **blue**). Since the Member Name is included in the CHIN'S DD DSN keyword, do not put the Member Name in the SCYDATA field.

e.g.

```
SCYDATA('DDName')
```

CHIN JCL using Partition DataSet

```
//MQAUSXIN DD DISP=SHR,DSN=+HLQ+.CPTLWARE.MQAUSX.SYSIN(MQAUSXIN)
```

```
DEFINE CHANNEL ('SYSTEM.ADMIN.SVRCONN') CHLTYPE(SVRCONN) +  
  TRPTYPE(TCP) +  
  SCYEXIT('MQAUSX') +  
  SCYDATA('MQAUSXIN') +  
  REPLACE
```

4.1.1.2 SCYDATA with DD Name using Sequential DataSet

The CHIN's DD Name specifies a DSN which will contain the Sequential DataSet. As seen below, the DD Name in the SCYDATA field matches the DD Name in the CHIN's JCL.

e.g.

```
SCYDATA('DDName')
```

CHIN JCL using Sequential DataSet

```
//MQAUSXIN DD DISP=SHR,DSN=+HLQ+.CPTLWARE.MQAUSX.SYSIN.SEQ
```

```
DEFINE CHANNEL ('SYSTEM.ADMIN.SVRCONN') CHLTYPE(SVRCONN) +  
  TRPTYPE(TCP) +  
  SCYEXIT('MQAUSX') +  
  SCYDATA('MQAUSXIN') +  
  REPLACE
```

4.1.2 SCYDATA with DD Name and Member Name

In this case, both the DD Name (highlighted in **red**) and the Member Name (highlighted in **blue**) are used to specify the IniFile since the DSN keyword of the DD statement only contains the Partition DataSet Name. In other words, the user specifies the Member Name as a parameter to the SCYDATA field. This is a dynamic configuration that allows for different IniFiles for different channels.

e.g.

```
SCYDATA('DDName(MemberName)')
```

CHIN JCL using Partition DataSet

```
//MQAUSXIN DD DISP=SHR,DSN=+HLQ+.CPTLWARE.MQAUSX.SYSIN
```

```
DEFINE CHANNEL ('SYSTEM.ADMIN.SVRCONN') CHLTYPE(SVRCONN) +  
  TRPTYPE(TCP) +  
  SCYEXIT('MQAUSX') +  
  SCYDATA('MQAUSXIN(MQAUSXIN)') +  
  REPLACE
```

4.2 SVRCONN Channel

This section describes the necessary entries to enable the server-side security exit. The MQ Administrator will need to update 2 fields of the SVRCONN Channel that the server-side security exit will be applied to.

4.2.1 z/OS

On z/OS, SCYEXIT and SCYDATA will contain the following values assuming a default install:

- SCYEXIT
MQAUSX
- SCYDATA
MQAUSXIN

```
DEFINE CHANNEL ('SYSTEM.ADMIN.SVRCONN') CHLTYPE(SVRCONN) +  
  TRPTYPE(TCP) +  
  SCYEXIT('MQAUSX') +  
  SCYDATA('MQAUSXIN') +  
  REPLACE
```


5 IniFile Keywords (Server-side)

This section describes IniFile keywords.

5.1 Logging

This section describes the necessary entries to enable z/MQAUSX to record log information. To enable and control logging, you need 6 keywords in the IniFile:

1. **LogMode** specifies what type of logging the user wishes to have. LogMode supports 4 values [Q / N / V / D] where Q is Quiet, N is Normal, V is Verbose and D is Debug. The default value is N.
2. **LogFile** specifies the location of the log file. The default is as follows:

For z/OS:

LogFile=SYSPRINT

3. **WriteToSystemLog** specifies that z/MQAUSX write a log entry to the server's 'logging system'. On z/OS, the server's 'logging system' is JES. The default value is N.
4. **SystemLogMessage** specifies what messages will be written to the system log.. SystemLogMessage supports 3 values [B / A / R] where B is Both, A is Accepted Only, and R is Rejected Only messages. The default value is B.
5. **WriteToEventQueue** specifies whether or not MQAUSX will write an event message containing the log entry information to the event queue. The default value is N.

WriteToEventQueue provides the ability to write custom MQ Events to System Channel Event Queue to allow MQAUSX to be tied into an MQ Monitoring tool.

- 9101 for Connection rejected (Authentication failed) event message
- 9201 for MCC Warning event message
- 9202 for MCC Exceeded event message

6. **EventQueueName** specifies the event queue name. The default value is 'SYSTEM.ADMIN.CHANNEL.EVENT'.

```
LogMode=N  
LogFile=SYSPRINT  
writeToSystemLog=Y
```

5.2 Allow or Restrict the Incoming IP Address

This section describes the necessary entries to enable the feature that allows or restricts the incoming IP addresses through the use of regular expression patterns. This feature uses the following two keywords:

- **UseAllowIP** controls the use of AllowIP. Set to Y to activate feature.
- **AllowIP** specifies the regular expression patterns that limit the allowable incoming IP addresses

The server-side security exit will look up the regular expression patterns from the **AllowIP** keyword in order to determine if the entire incoming IP address matches any of the specified expression patterns. Each regular expression pattern is separated from the next pattern by a semi-colon (;).

In the regular expression pattern:

- '*' matches any sequence of characters (zero or more)
- '?' matches any single character
- '#' matches any single numeric digit (0-9)
- '@' matches any single alphabetic character (A-Z, a-z)
- [SET] matches any character in the specified set
- [!SET] or [^SET] matches any character except those specified in the set (negation).

A SET can be composed of characters or ranges. A range is in the form: 'character – character' (i.e. 0-9 or A-Z). Although this is the simplest range allowed in the [] pattern, more complex inclusive ranges such as [0-9a-zA-Z] are allowed. [0-9a-zA-Z] specifies that the character can be 0 through 9 **or** a through z **or** A through Z. Other characters are allowed (ie. 8 bit characters) if your system supports them.

In order to suppress the special syntactic significance of any of these characters '[] * ? # @ ! ^ - \', a backslash ('\') must precede the special character.

Note: AllowIP must NOT exceed 1024 characters.

```
UseAllowIP=Y
AllowIP=192.168.*.*;10.15[0-9].2[0-5][0-9];127.0.0.?
```

5.3 Allow or Restrict the Incoming Hostname

This section describes the necessary entries to enable the feature that allows or restricts the incoming Hostnames through the use of regular expression patterns. This feature uses the following two keywords:

- **UseAllowHostname** controls the use of AllowHostname. Set to Y to activate feature.
- **AllowHostname** specifies the regular expression patterns that limit the allowable incoming Hostnames

The server-side security exit will look up the regular expression patterns from the **AllowHostname** keyword in order to determine if the entire incoming Hostname matches any of the specified expression patterns. Each regular expression pattern is separated from the next pattern by a semi-colon (;).

In the regular expression pattern:

- '*' matches any sequence of characters (zero or more)
- '?' matches any single character
- '#' matches any single numeric digit (0-9)
- '@' matches any single alphabetic character (A-Z, a-z)
- [SET] matches any character in the specified set
- [!SET] or [^SET] matches any character except those specified in the set (negation).

A SET can be composed of characters or ranges. A range is in the form: 'character – character' (i.e. 0-9 or A-Z). Although this is the simplest range allowed in the [] pattern, more complex inclusive ranges such as [0-9a-zA-Z] are allowed. [0-9a-zA-Z] specifies that the character can be 0 through 9 **or** a through z **or** A through Z. Other characters are allowed (ie. 8 bit characters) if your system supports them.

In order to suppress the special syntactic significance of any of these characters '[] * ? # @ ! ^ - \', a backslash ('\') must precede the special character.

Note: *AllowHostname must NOT exceed 1024 characters.*

Separate each Hostname pattern with a ';' semi-colon.

```
UseAllowHostname=Y  
AllowHostname=abc01.acme.com;abc02.acme.com
```

5.4 Allow or Restrict the Incoming SSL DN

This section describes the necessary entries to enable the feature that allows or restricts the incoming SSL DN through the use of regular expression patterns. This feature uses the following two keywords:

- **UseAllowSSLDN** controls the use of AllowSSLDN. Set to Y to activate feature.
- **AllowSSLDN** specifies the regular expression patterns that limit the allowable incoming SSL DN

The server-side security exit will look up the regular expression patterns from the **AllowSSLDN** keyword in order to determine if the entire incoming SSL DN matches any of the specified expression patterns. Each regular expression pattern is separated from the next pattern by a semi-colon (;).

In the regular expression pattern:

- '*' matches any sequence of characters (zero or more)
- '?' matches any single character
- '#' matches any single numeric digit (0-9)
- '@' matches any single alphabetic character (A-Z, a-z)
- [SET] matches any character in the specified set
- [!SET] or [^SET] matches any character except those specified in the set (negation).

A SET can be composed of characters or ranges. A range is in the form: 'character – character' (i.e. 0-9 or A-Z). Although this is the simplest range allowed in the [] pattern, more complex inclusive ranges such as [0-9a-zA-Z] are allowed. [0-9a-zA-Z] specifies that the character can be 0 through 9 **or** a through z **or** A through Z. Other characters are allowed (ie. 8 bit characters) if your system supports them.

In order to suppress the special syntactic significance of any of these characters '[] * ? # @ ! ^ - \', a backslash ('\') must precede the special character.

Note: AllowSSLDN must NOT exceed 1024 characters.

```
UseAllowSSLDN=Y
AllowSSLDN=O=Capitalware,DC=net;CN=roger;O=acme
```

5.5 Allow or Restrict the Incoming UserID

This section describes the necessary entries to enable the feature that allows or restricts the incoming UserIDs through the use of regular expression patterns. This feature uses the following two keywords:

- **UseAllowUserID** controls the use of AllowUserID. Set to Y to activate feature.
- **AllowUserID** specifies the regular expression patterns that limit the allowable incoming UserIDs

The server-side security exit will look up the regular expression patterns from the **AllowUserID** keyword in order to determine if the entire incoming UserID matches any of the specified expression patterns. Each regular expression pattern is separated from the next pattern by a semi-colon (;).

In the regular expression pattern:

- '*' matches any sequence of characters (zero or more)
- '?' matches any single character
- '#' matches any single numeric digit (0-9)
- '@' matches any single alphabetic character (A-Z, a-z)
- [SET] matches any character in the specified set
- [!SET] or [^SET] matches any character except those specified in the set (negation).

A SET can be composed of characters or ranges. A range is in the form: 'character – character' (i.e. 0-9 or A-Z). Although this is the simplest range allowed in the [] pattern, more complex inclusive ranges such as [0-9a-zA-Z] are allowed. [0-9a-zA-Z] specifies that the character can be 0 through 9 **or** a through z **or** A through Z. Other characters are allowed (ie. 8 bit characters) if your system supports them.

In order to suppress the special syntactic significance of any of these characters '[] * ? # @ ! ^ - \', a backslash ('\') must precede the special character.

Note: AllowUserID must NOT exceed 1024 characters.

```
AllowUserID=mq*;hr[0-9][a-f];abc??01
```

5.6 Reject the Incoming IP Address

This section describes the necessary entries to enable the feature that rejects the incoming IP addresses through the use of regular expression patterns. This feature uses the following two keywords:

- **UseRejectIP** controls the use of RejectIP. Set to Y to activate feature.
- **RejectIP** specifies the regular expression patterns that explicitly reject incoming IP Address

The server-side security exit will look up the regular expression patterns from the **RejectIP** keyword in order to determine if the entire incoming IP address matches any of the specified expression patterns. Each regular expression pattern is separated from the next pattern by a semi-colon (;).

In the regular expression pattern:

- '*' matches any sequence of characters (zero or more)
- '?' matches any single character
- '#' matches any single numeric digit (0-9)
- '@' matches any single alphabetic character (A-Z, a-z)
- [SET] matches any character in the specified set
- [!SET] or [^SET] matches any character except those specified in the set (negation).

A SET can be composed of characters or ranges. A range is in the form: 'character – character' (i.e. 0-9 or A-Z). Although this is the simplest range allowed in the [] pattern, more complex inclusive ranges such as [0-9a-zA-Z] are allowed. [0-9a-zA-Z] specifies that the character can be 0 through 9 **or** a through z **or** A through Z. Other characters are allowed (ie. 8 bit characters) if your system supports them.

In order to suppress the special syntactic significance of any of these characters '[] * ? # @ ! ^ - \', a backslash ('\') must precede the special character.

Note: RejectIP must NOT exceed 1024 characters.

```
UseRejectIP=Y
RejectIP=192.161.*.*;10.13[0-9].2[0-5][0-9];10.10.1.15
```

5.7 Reject by Hostname

This section describes the necessary entries to enable the feature that rejects by the Hostnames through the use of regular expression patterns. This feature uses the following two keywords:

- **UseRejectHostname** controls the use of RejectHostname. Set to Y to activate feature.
- **RejectHostname** specifies the regular expression patterns that explicitly reject by hostname

The server-side security exit will look up the regular expression patterns from the **RejectHostname** keyword in order to determine if the entire incoming Hostname matches any of the specified expression patterns. Each regular expression pattern is separated from the next pattern by a semi-colon (;).

In the regular expression pattern:

- '*' matches any sequence of characters (zero or more)
- '?' matches any single character
- '#' matches any single numeric digit (0-9)
- '@' matches any single alphabetic character (A-Z, a-z)
- [SET] matches any character in the specified set
- [!SET] or [^SET] matches any character except those specified in the set (negation).

A SET can be composed of characters or ranges. A range is in the form: 'character – character' (i.e. 0-9 or A-Z). Although this is the simplest range allowed in the [] pattern, more complex inclusive ranges such as [0-9a-zA-Z] are allowed. [0-9a-zA-Z] specifies that the character can be 0 through 9 **or** a through z **or** A through Z. Other characters are allowed (ie. 8 bit characters) if your system supports them.

In order to suppress the special syntactic significance of any of these characters '[] * ? # @ ! ^ - \', a backslash ('\') must precede the special character.

Note: RejectHostname must NOT exceed 1024 characters.

Separate each Hostname pattern with a ';' semi-colon.

```
UseReject=Y
RejectHostname=xyz01.acme.com;xyz02.acme.com
```

5.8 Reject the Incoming SSL DN

This section describes the necessary entries to enable the feature that rejects the incoming SSL DN through the use of regular expression patterns. This feature uses the following two keywords:

- **UseRejectSSLDN** controls the use of RejectSSLDN. Set to Y to activate feature.
- **RejectSSLDN** specifies the regular expression patterns that reject incoming SSL DN

The server-side security exit will look up the regular expression patterns from the **RejectSSLDN** keyword in order to determine if the entire incoming SSL DN matches any of the specified expression patterns. Each regular expression pattern is separated from the next pattern by a semi-colon (;).

In the regular expression pattern:

- '*' matches any sequence of characters (zero or more)
- '?' matches any single character
- '#' matches any single numeric digit (0-9)
- '@' matches any single alphabetic character (A-Z, a-z)
- [SET] matches any character in the specified set
- [!SET] or [^SET] matches any character except those specified in the set (negation).

A SET can be composed of characters or ranges. A range is in the form: 'character – character' (i.e. 0-9 or A-Z). Although this is the simplest range allowed in the [] pattern, more complex inclusive ranges such as [0-9a-zA-Z] are allowed. [0-9a-zA-Z] specifies that the character can be 0 through 9 **or** a through z **or** A through Z. Other characters are allowed (ie. 8 bit characters) if your system supports them.

In order to suppress the special syntactic significance of any of these characters '[] * ? # @ ! ^ - \', a backslash ('\') must precede the special character.

Note: RejectSSLDN must NOT exceed 1024 characters.

```
UseRejectSSLDN=Y
RejectSSLDN=O=xyz* ;O=abc* ;
```

5.9 Reject the Incoming UserID

This section describes the necessary entries to enable the feature that rejects the incoming UserIDs through the use of regular expression patterns. This feature uses the following two keywords:

- **UseRejectUserID** controls the use of RejectUserID. Set to Y to activate feature.
- **RejectUserID** specifies the regular expression patterns that reject incoming UserID

The server-side security exit will look up the regular expression patterns from the **RejectUserID** keyword in order to determine if the entire incoming UserID matches any of the specified expression patterns. Each regular expression pattern is separated from the next pattern by a semi-colon (;).

In the regular expression pattern:

- '*' matches any sequence of characters (zero or more)
- '?' matches any single character
- '#' matches any single numeric digit (0-9)
- '@' matches any single alphabetic character (A-Z, a-z)
- [SET] matches any character in the specified set
- [!SET] or [^SET] matches any character except those specified in the set (negation).

A SET can be composed of characters or ranges. A range is in the form: 'character – character' (i.e. 0-9 or A-Z). Although this is the simplest range allowed in the [] pattern, more complex inclusive ranges such as [0-9a-zA-Z] are allowed. [0-9a-zA-Z] specifies that the character can be 0 through 9 **or** a through z **or** A through Z. Other characters are allowed (ie. 8 bit characters) if your system supports them.

In order to suppress the special syntactic significance of any of these characters '[] * ? # @ ! ^ - \', a backslash ('\') must precede the special character.

Note: RejectUserID must NOT exceed 1024 characters.

```
UseRejectUserID=Y
RejectUserID=abc*;x[0-9][a-f]
```

5.10 Set Maximum Number of Incoming Connections per Channel

This section describes the necessary entries to set a maximum number of allowable connections per a given channel. This is controlled by the IniFile's property keyword 'UseMCC'. Setting 'UseMCC' to 'Y' (Yes) will cause the server-side security exit to look up channel's name as a property keyword in the IniFile.

To enable the restricting of allowable connections per a given channel, you need 9 keywords in the IniFile:

1. **UseMCC** enables restricting of allowable connections per a given channel
2. **MCCRedoMinutes** specifies a time interval to issue the 'display channel status' command.
3. **MCCRedoCount** specifies how often the 'display channel status' command should be issued.
4. **MCCGetTimeOut** specifies how long the security exit will wait for the reply from the queue manager's command server. The default value is 3 seconds.
5. **DefaultMCC** specifies the default maximum allowable connections for a particular channel.
6. **MCCEventWarnLevel** specifies the percentage of incoming channels to the maximum allowable number of channels that will cause MQAUSX to write a warning message to the event queue. The default value is 80.
7. **ModelQueueName** is the name of the system model reply queue
8. **CommandQueueName** is the name of the command queue used by the Queue Manager's Command Server
9. **TempDynPrefix** is the queue name prefix that will be used when the Queue Manager creates the temporary dynamic queue

For example, if 'UseMCC' is set to 'Y' and the incoming connection is on 'SYSTEM.ADMIN.SVRCONN', the server-side security exit will look up in the IniFile the keyword of 'SYSTEM.ADMIN.SVRCONN'. If the 'SYSTEM.ADMIN.SVRCONN' keyword is not found, then the server-side security exit will look up 'DefaultMCC' keyword in the IniFile.

If the 'DefaultMCC' keyword is not found, the 'UseMCC' keyword is then switched to 'N' (No).

The server-side security exit uses shared memory to keep track of the channel connection and disconnection. MQAUSX was designed to periodically refresh the shared memory counter by issuing a PCF command to get the current channel status. This information is written to the shared memory.

There are 2 IniFile keywords to control how often the PCF Inquire channel status command is issued: 'MCCRedoMinutes' and 'MCCRedoCount'. 'MCCRedoMinutes' keyword states that the server-side security exit should issue PCF command if more than 'x' minutes have passed since the last PCF command was issued. The default value for 'MCCRedoMinutes' is 720 minutes. 'MCCRedoCount' keyword states that the server-side security exit should issue PCF command if more than 'x' connection attempts passed since the last PCF command was issued. The default value for 'MCCRedoCount' is 1000.

MCCEventWarnLevel keyword states that the server-side security exit should write a warning message to the event queue when the number of connections exceeds the percentage level. The default value for 'MCCEventWarnLevel' is 80. Note: Only used if both UseMCC and WriteToEventQueue are each set to 'Y'.

MCCGetTimeOut keyword specifies how long the security exit should wait for a reply from the queue manager's command server. The default value is 3 seconds.

```
UseMCC=Y
SYSTEM.ADMIN.SVRCONN=5
ABC.CH01=50
DEF.CH01=40
SYSTEM.DEF.SVRCONN=5
#
DefaultMCC=25
#
MCCRedoMinutes=900
MCCRedoCount=2000
MCCGetTimeOut=5
#
CommandQueueName=SYSTEM.COMMAND.INPUT
ModelQueueName=SYSTEM.COMMAND.REPLY.MODEL
TempDynPrefix=SYSTEM.MQAUSX.*
```

Note: For queue managers with thousands for active connections, the user may wish to increase the values for 'MCCRedoMinutes' and 'MCCRedoCount' to a higher value. This will keep the overhead to a minimum.

```
MCCRedoMinutes=1440
MCCRedoCount=8000
```

5.11 File Based Authentication

This section describes the necessary steps to enable 'File Based Authentication'. By default, the server-side security exit will do UserId and Password against the native OS (Operating System). The company or MQ Administrator can choose to have authentication against a file-based look-up system.

5.11.1 Encrypted FBA

5.11.1.1 Encrypted File Based Authentication Configuration

It is strongly recommended that native OS authentication is used. To enable the encrypted server-side file-based authentication, 2 keywords are needed in the IniFile:

1. **UseFBA** allows the UserId and Password to be verified against a file rather than the OS
2. **FBAFile** specifies the DD of the encrypted FBA file to do the UserId and Password verification

```
UseFBA=Y  
FBAFile=FBAENC
```

5.11.1.2 Encrypted file Management

Follow the instructions in Appendix C for creating / managing an encrypted server-side FBA file.

5.11.2 Plain Text FBA

5.11.3 File Based Authentication Configuration

It is strongly recommended that you use native OS authentication. To enable the file-based authentication, you need 2 keywords in the IniFile:

- **UseFBA** allows the UserId and Password to be verified against a file rather than the OS
- **FBAFile** specifies the DDName of the file to do the UserId and Password verification

```
UseFBA=Y  
FBAFile=FBAFILE
```

5.11.3.1 File Based Authentication File Layout

The following table specifies the format of the File Based Authentication File:

File Based Verification – File Layout									
Field Name	Description	Req'd Y/N	Min/ Max	Data Type	Format	Start Pos.	End Pos.	Justified	Pad Character
UserID	UserID of the user logging in	Y	1/32	Char	Alpha/Numeric	1	32	Left	Space
Password	The password for the specified UserID	Y	1/32	Char	Alpha/Numeric	33	64	Left	Space

5.12 Proxy ID

This section describes the necessary steps to enable the use of 'Proxy IDs'. Proxy ID allows an authorized User to use a different UserID for MQ interactions.

- **UseProxy** allows an authorized User to use a different UserID for MQ interactions
- **ProxyFile** specifies the DDName of the file to do alternate UserID look-up

```
UseProxy=Y  
ProxyFile=PROXY
```

The format of the Proxy file is similar to an IniFile or properties file where each keyword has an associated value. Each keyword and its value is on a separate line. The format is as follows:

validated_UserID = ProxyID

Example:

```
Roger=app1  
Fred=app2  
Barney=app1
```

If the UserID is not found in the Proxy file then the incoming connection is rejected. To have a default Proxy UserID in the Proxy file use the "DefaultProxyID" value.

Example:

```
DefaultProxyID=readonly
```

5.13 Order of Authentication

This section describes the necessary steps to enable UserId and Password against multiple authentication sources and the order in which these sources will be tested. Currently, z/MQAUSX supports 2 authentication sources: files and mqausx.

- **UseAuthOrder** allows the user to specify the authentication methods and order of these methods.
- **AuthOrder** specifies which authentication method to be executed and the order of execution. AuthOrder supports the following 2 values:
 - **files** means the authentication will be against the local z/OS
 - **mqausx** means the authentication will be against z/MQAUSX formatted file (i.e. FBA).

Note: If more than authentication method is specified for AuthOrder parameter then the authentication order will be from left to right.

```
UseAuthOrder=Y  
AuthOrder= files mqausx
```

5.14 AllowMQCSPAuth

This section describes the necessary entries to enable WebSphere MQ v6.0's new MQSCP security structure. Setting 'AllowMQCSPAuth' to 'Y' (Yes) will allow use of MQCSP.

```
AllowMQCSPAuth=Y
```

5.15 Allow Users to login as mqm

This section describes the necessary entries to enable users to login with the mqm or MUSR_MQADMIN or QMQM system account. This is controlled by the IniFile's property keyword 'Allowmqm'. Setting 'Allowmqm' to 'Y' (Yes) will activate this feature; otherwise, it will be blocked.

```
Allowmqm=Y
```

5.16 Turning off Authentication

This section describes the necessary entries to disable authentication in the server-side security exit. ***Be very careful when disabling authentication because the connecting user will not need a client-side security exit to make a valid connection to the channel.*** This is controlled by the IniFile's property keyword 'NoAuth'. Setting 'NoAuth' to 'Y' (Yes) will disable server-side authentication.

```
NoAuth=Y
```

5.17 Allow Connection to have a Blank UserID

This section describes the necessary entries to enable connection to have a blank UserID. ***This parameter is only valid when 'NoAuth' is set to 'Y'.*** This is controlled by the IniFile's property keyword 'AllowBlankUserID'. Setting 'AllowBlankUserID' to 'Y' (Yes) will allow connections to have a blank UserID.

```
AllowBlankUserID=Y
```

5.18 MCAUSER Field

This section describes the necessary steps to enable the use of the channel's MCAUSER field. If this IniFile parameter is set to 'Y' (Yes) then after the authentication process is complete, the connection will use the UserID value specified in the MCAUSER field.

- **UseMCAUser** enables the connection to use the UserID value specified in the channel's MCAUSER field

```
UseMCAUser=Y
```

5.19 SSL Self-Signed Certificate

This section describes the necessary steps to allow or reject SSL Self-Signed Certificates. If the AllowSSLSSCert IniFile parameter is set to 'Y' (Yes) then the SSL Self-Signed Certificate are allowed. If AllowSSLSSCert is set to 'N' (No), the SSL Self-Signed Certificate is disallowed (i.e. the incoming connection is closed).

- AllowSSLSSCert specifies whether or not to allow the Self-Signed Certificate on the channel.

```
AllowSSLSSCert=Y
```

5.20 SSLCertUserID Field

This section describes the necessary steps to enable the use of the channel's SSLCertUserID field. If the UseSSLCertUserID IniFile parameter is set to 'Y' (Yes) then after the authentication process is complete, the connection will use the UserID value specified in the SSLCertUserID field.

- **UseSSLCertUserID** enables the connection to use the UserID value specified in the channel's SSLCertUserID field

```
UseSSLCertUserID=Y
```

5.21 Set UserID from SSL DN

MQAUSX supports the retrieval of the UserID from the channel's SSL DN field. To enable the retrieval of the UserID from the channel's SSL DN field, you may use the following 4 keywords in the IniFile:

- **UseSSLUserIDFromDN** specifies that the UserID is to be retrieved from a SSL DN entry.
- **SSLDNAttrName** specifies the SSL DN attribute field name
- **SSLDNAttrStartPos** specifies the start position of the retrieval
- **SSLDNAttrLength** specifies the length of the field to be extracted (* means all)

```
UseSSLUserIDFromDN = Y
SSLDNAttrName = CN
SSLDNAttrStartPos = 1
SSLDNAttrLength = *
```

5.22 UppercaseUserID

This section describes the necessary steps to enable the folding of the incoming UserID to uppercase. If this IniFile parameter is set to Yes then after the authentication process is complete, the connection will use the UserID value specified in the MCAUSER field.

- **UppercaseUserID** specifies that the incoming UserID should be folded to uppercase.

```
UppercaseUserID=Y
```

5.23 LicenseFile

This section will describe how to have a file that contains all of the user's z/MQAUSX license keys.

The format of the LicenseFile is similar to an IniFile or properties file where each keyword has an associated value. Each keyword and its value are on a separate line. The format is as follows:

QMgrName = License_Key

Example:

```
MQA1 = 10A0-AAAA-BBBBBBBB  
MQB1 = 10A0-XXXX-CCCCCCCC
```

If the queue manager name is not found in the LicenseFile then the License keyword will be used to retrieve the license key value.

The following are the default values for LicenseFile:

For z/OS DD:

LicenseFile=AUSXFILE

5.24 License Key

This section will describe how to license MQ Authenticate User Security Exit for z/OS to a particular queue manager.

Note: The License keyword is not required if the user has implemented the LicenseFile keyword or the License file actually exists in the default location.

Your license will look something like: 10A0-AAAA-BBBBBBBB (Note: This is a sample license only and will NOT work).

```
License=10A0-AAAA-BBBBBBBB
```

6 Server-side Log File

To verify that the process flow was successful, you can view the log file for the events that are generated.

6.1 z/OS

The log file is located at the following (assuming a default install of SYSPRINT):

CHIN Started-task JES-log

All log entries will be marked with either **INFO** or **ERROR** in columns 21 to 26.

6.1.1 Authentication Log Sample

```
2004/11/18 00:47:53 INFO      MQAUSX #00881: Connection accepted for UserID='rlacroix'  
UserSpecifiedServer='roger-1525ca' QMgr='MQA1' ChlName='MY.TEST.EXIT' ConName='127.0.0.1' Server='roger-  
1525ca' RemoteUserID=''  
2004/11/18 00:49:12 INFO      MQAUSX #00881: Connection accepted for UserID='rlacroix'  
UserSpecifiedServer='roger-1525ca' QMgr='MQA1' ChlName='MY.TEST.EXIT' ConName='127.0.0.1' Server='roger-  
1525ca' RemoteUserID=''  
2004/11/18 00:50:11 INFO      MQAUSX #00881: Connection accepted for UserID='rlacroix'  
UserSpecifiedServer='roger-1525ca' QMgr='MQA1' ChlName='MY.TEST.EXIT' ConName='127.0.0.1' Server='roger-  
1525ca' RemoteUserID=''
```

6.1.2 Non-Authentication Log Sample

```
2004/11/18 00:47:53 INFO      MQAUSX #00881: Connection accepted for QMgr='MQA1' ChlName='MY.TEST.EXIT'  
ConName='127.0.0.1' RemoteUserID=''  
2004/11/18 00:49:12 INFO      MQAUSX #00881: Connection accepted for QMgr='MQA1' ChlName='MY.TEST.EXIT'  
ConName='127.0.0.1' RemoteUserID=''  
2004/11/18 00:50:11 INFO      MQAUSX #00881: Connection accepted for QMgr='MQA1' ChlName='MY.TEST.EXIT'  
ConName='127.0.0.1' RemoteUserID=''
```

7 Appendix A – z/MQAUSX IniFile (Server-side)

The sample IniFile below is the z/MQAUSX IniFile supplied for z/OS. The IniFile supports the following keywords and their values:

```
LogMode=N
LogFile=SYSPRINT
UseFBA = N
Allowmqm=N
UseMCC=N
UseAllowIP=N
UseProxy=N
SequenceNumberFlag=N
```

Note: Keywords are case sensitive.

Keyword	Description of Server-side keywords
AllowBlankUserID	<p>AllowBlankUserID specifies where or not to allow the incoming connection to have a blank UserID value. <i>This feature is only valid when the 'NoAuth' keyword is set to 'Y'</i>. AllowBlankUserID supports 2 values [Y / N]. The default value is N.</p> <p>e.g. AllowBlankUserID=Y</p>
AllowHostname	<p>AllowHostname specifies a set of regular expression patterns that the hostname will be compared against. The default is '*'. You must separate the hostname regular expression patterns with a ';' semi-colon.</p> <p>e.g. AllowHostname=abc01.acme.com;abc02.acme.com</p> <p>Note: Only used if UseAllowHostname is set to 'Y'.</p>
AllowIP	<p>AllowIP specifies a set of regular expression patterns that the incoming channel's IP address will be parsed against. The default is '*'. You must separate the IP regular expression patterns with a ';' semi-colon.</p> <p>e.g. AllowIP=192.168.*.1[0-5][0-9];127.0.0.?.10.*.*[0-9]</p> <p>Note: Only used if UseAllowIP is set to 'Y'.</p>

Keyword	Description of Server-side keywords
AllowMQCSPAuth	<p>AllowMQCSPAuth specifies necessary entries to enable WebSphere MQ v6.0's new MQSCP security structure. AllowMQCSPAuth supports 2 values [Y / N]. The default value is Y.</p> <p>e.g. AllowMQCSPAuth=Y</p>
Allowmqm	<p>Allowmqm specifies whether or not to allow a user to be able to login using 'mqm' (Unix), 'MUSR_MQADMIN' (Windows) or 'QMQM' (OS/400) system account. Allowmqm supports 2 values [Y / N]. The default value is N.</p> <p>e.g. Allowmqm=Y</p>
AllowSSLDN	<p>AllowSSLDN specifies a set of regular expression patterns that the incoming channel's SSL DN will be compared against. You must separate the SSL DN regular expression patterns with a ';' semi-colon.</p> <p>e.g. AllowSSLDN=O=Capitalware,C=CA;O=IBM,DC=com</p> <p>Note: Only used if UseAllowSSLDN is set to 'Y'.</p>
AllowSSLSSCert	<p>AllowSSLSSCert specifies whether or not to allow Self-Signed Certificate on the channel. AllowSSLSSCert supports 2 values [Y / N]. The default value is Y.</p> <p>e.g. AllowSSLSSCert=Y</p>
AuthOrder	<p>AuthOrder specifies which authentication sources that the UserId and Password will be tested against. The authentication order is from left to right. There are 2 supported values: files and mqaux.</p> <p>e.g. AuthOrder= files mqaux</p> <p>Note: Only used if UseAuthOrder is set to 'Y'.</p>
CommandQueueName	<p>CommandQueueName specifies the queue used by the queue manager's Command Server to process MQSC commands. The default value is 'SYSTEM.COMMAND.INPUT'.</p> <p>e.g. CommandQueueName=SYSTEM.COMMAND.INPUT</p> <p>Note: Only used if UseMCC is set to 'Y'.</p>

Keyword	Description of Server-side keywords
DefaultMCC	<p>DefaultMCC specifies a default maximum number of incoming connections that a particular channel will allow. There is no default value.</p> <p>e.g. DefaultMCC=25</p>
EventQueueName	<p>EventQueueName specifies the name of the event queue. The default value is 'SYSTEM.ADMIN.CHANNEL.EVENT'.</p> <p>e.g. EventQueueName= SYSTEM.ADMIN.CHANNEL.EVENT</p> <p>Note: Only used if WriteToEventQueue is set to 'Y'.</p>
FBAFile	<p>FBAFile specifies the DDName of the file that will be used for UserId and Password authentication. The default value is 'FBAFILE'.</p> <p>e.g. FBAFile=FBAFILE</p> <p>Note: Only used if UseFBA is set to 'Y'.</p>
License	<p>License specifies the queue manager's license key. Your license will look something like: 0000-AAAA-BBBBBBBB (Note: This is a sample license only and will NOT work).</p> <p>e.g. License=0000-AAAA-BBBBBBBB</p>
LicenseFile	<p>LicenseFile specifies the location of License file that contains all of the customer's license keys.</p> <p>The following are the default values for LicenseFile:</p> <p>For z/OS DD: LicenseFile=AUSXFILE</p> <p>e.g. LicenseFile=AUSXFILE</p>
LogFile	<p>LogFile specifies the location of the log file. The default is as follows:</p> <p>For z/OS: LogFile=SYSPRINT</p>

Keyword	Description of Server-side keywords
LogMode	<p>LogMode specifies what type of logging the user wishes to have. LogMode supports 4 values [Q / N / V / D] where Q is Quiet, N is Normal, V is Verbose and D is Debug. The default value is N.</p> <p>e.g. LogMode=N</p>
MCCEventWarnLevel	<p>MCCEventWarnLevel specifies the percentage of incoming channels to the maximum allowable number of channels that will cause MQAUSX to write a warning message to the event queue. The default value is 80.</p> <p>e.g. MCCEventWarnLevel =80</p> <p>Note: Only used if both UseMCC and WriteToEventQueue are each set to 'Y'.</p>
MCCGetTimeOut	<p>MCCGetTimeOut specifies the number of seconds that the security exit will wait for a reply from the queue manager's command server. The default value is 3.</p> <p>e.g. MCCRedoCount=3</p> <p>Note: Only used if UseMCC is set to 'Y'.</p>
MCCRedoCount	<p>MCCRedoCount specifies the number of connection attempts to occur before the next PCF 'display current channel status' is issued. The default value is 1000.</p> <p>e.g. MCCRedoCount=1000</p> <p>Note: Only used if UseMCC is set to 'Y'.</p>
MCCRedoMinutes	<p>MCCRedoMinutes specifies the period of time in minutes to wait before the next 'display current channel status' is issued. The default value is 360 minutes.</p> <p>e.g. MCCRedoMinutes=360</p> <p>Note: Only used if UseMCC is set to 'Y'.</p>

Keyword	Description of Server-side keywords
ModelQueueName	<p>ModelQueueName specifies the model queue to be used when z/MQAUSX creates a temporary reply queue. The default value is 'SYSTEM.COMMAND.REPLY.MODEL'.</p> <p>e.g. ModelQueueName=SYSTEM.COMMAND.REPLY.MODEL</p> <p>Note: Only used if UseMCC is set to 'Y'.</p>
NoAuth	<p>NoAuth specifies whether or not to turn off authentication for the server-side security exit. <i>Be VERY careful with this option because if set to 'Y' then the user will not be prompted for their UserID & password on the client-side even if they have the client-side security exit enabled.</i> NoAuth supports 2 values [Y / N]. The default value is N.</p> <p>e.g. NoAuth=Y</p>
ProxyFile	<p>ProxyFile specifies the DDName of the file to do alternate UserID look-up. The default value is 'PROXY'.</p> <p>e.g. ProxyFile=PROXY</p> <p>Note: Only used if UseProxy is set to 'Y'.</p>
RejectHostname	<p>RejectHostname specifies a set of regular expression patterns that the hostname will be compared against. You must separate the hostname regular expression patterns with a ';' semi-colon.</p> <p>e.g. RejectHostname=xyz01.acme.com;xyz02.acme.com</p> <p>Note: Only used if UseAllowHostname is set to 'Y'.</p>
RejectIP	<p>RejectIP specifies a set of regular expression patterns that the incoming channel's IP address will be compared against. You must separate the IP regular expression patterns with a ';' semi-colon.</p> <p>e.g. RejectIP=192.168.*.1[0-5][0-9];127.0.0.?.10.*.*[0-9]</p> <p>Note: Only used if UseAllowIP is set to 'Y'.</p>

Keyword	Description of Server-side keywords
RejectSSLDN	<p>RejectSSLDN specifies a set of regular expression patterns that the incoming channel's SSL DN will be compared against. You must separate the SSL DN expression patterns with a ';' semi-colon.</p> <p>e.g. RejectSSLDN=O=xyz*,C=CA;O=abc*,DC=net</p> <p>Note: Only used if UseRejectSSLDN is set to 'Y'.</p>
RejectUserID	<p>RejectUserID specifies a set of regular expression patterns that the incoming connection's UserID will be compared against. You must separate each IP regular expression pattern with a ';' semi-colon.</p> <p>e.g. RejectUserID=mq*;abc??.xyz[0-9][a-f];hr[0-9][0-9]</p> <p>Note: Only used if UseRejectUserID is set to 'Y'.</p>
SequenceNumberFlag	<p>SequenceNumberFlag is a z/OS (OS/390) only flag. It states whether or not there are sequence numbers in columns 72 to 80. SequenceNumberFlag supports 2 values [Y / N]. The default value is N.</p> <p>e.g. SequenceNumberFlag = Y</p>
SSLDNAttrLength	<p>SSLDNAttrLength specifies the length of the extraction of the UserId from the SSL DN attribute. The default value is '*' (* means all).</p> <p>e.g. SSLDNAttrLength=*</p> <p>Note: Only used if UseSSLUserIDFromDN is set to 'Y'.</p>
SSLDNAttrName	<p>SSLDNAttrName specifies the name of SSL DN attribute to be used to extract UserId from. The default value is 'CN'.</p> <p>e.g. SSLDNAttrName=CN</p> <p>Note: Only used if UseSSLUserIDFromDN is set to 'Y'.</p>
SSLDNAttrStartPos	<p>SSLDNAttrStartPos specifies the start position for the extraction of the UserId from the SSL DN attribute. The default value is '1'.</p> <p>e.g. SSLDNAttrStartPos=1</p> <p>Note: Only used if UseSSLUserIDFromDN is set to 'Y'.</p>

Keyword	Description of Server-side keywords
SystemLogMessage	<p>SystemLogMessage specifies what messages will be written to the system log.. SystemLogMessage supports 3 values [B / A / R] where B is Both, A is Accepted Only, and R is Rejected Only messages. The default value is B.</p> <p>e.g. SystemLogMessage=B</p> <p>Note: Only used if WriteToSystemLog is set to ‘Y’.</p>
TempDynPrefix	<p>TempDynPrefix specifies a prefix name for the temporary dynamic queue. The default value is ‘SYSTEM.MQAUSX.*’.</p> <p>e.g. TempDynPrefix= SYSTEM.MQAUSX.*</p> <p>Note: Only used if UseMCC is set to ‘Y’.</p>
UppercaseUserID	<p>UppercaseUserID specifies that the incoming UserID should be folded to uppercase. UppercaseUserID supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UppercaseUserID =Y</p>
UseAllowHostname	<p>UseAllowHostname allows MQ Admin to allow or restrict by hostname by comparing it against a regular expression pattern. UseAllowHostname supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseAllowHostname=Y</p>
UseAllowIP	<p>UseAllowIP allows MQ Admin to allow or restrict incoming channel IP address against a regular expression pattern. UseAllowIP supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseAllowIP=Y</p>
UseAllowSSLDN	<p>UseAllowSSLDN allows MQ Admin to allow or restrict incoming channel's SSL DN by comparing it against a regular expression pattern. UseAllowSSLDN supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseAllowSSLDN=Y</p>

Keyword	Description of Server-side keywords
UseAllowUserID	<p>UseAllowUserID allows MQ Admin to allow or restrict incoming UserID by comparing it against a regular expression pattern. UseAllowUserID supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseAllowUserID=Y</p>
UseAuthOrder	<p>UseAuthOrder allows the connection to be tested against more than one authentication sources. UseAuthOrder supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseAuthOrder=Y</p>
UseFBA	<p>UseFBA allows the UserId and Password to be authenticated against a file rather than the OS. UseFBA supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseFBA=Y</p>
UseMCAUser	<p>UseMCAUser allows the connection to use the UserID value specified in the channel's MCAUSER field. UseMCAUser supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseMCAUser=Y</p>
UseMCC	<p>UseMCC allows MQ Admin to set a limit on the maximum number of connections to a given channel. UseMCC supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseMCC=Y</p>
UseProxy	<p>UseProxy allows an authorized User to use a different UserID for MQ interactions. UseProxy supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseProxy=N</p>
UseRejectHostname	<p>UseRejectHostname allows MQ Admin to reject a hostname by comparing it against a regular expression pattern. UseRejectHostname supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseRejectHostname=Y</p>

Keyword	Description of Server-side keywords
UseRejectIP	<p>UseRejectIP allows MQ Admin to reject incoming channel IP address by comparing it against a regular expression pattern. UseRejectIP supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseRejectIP=Y</p>
UseRejectSSLDN	<p>UseRejectSSLDN allows MQ Admin to reject incoming channel's SSL DN by comparing it against a regular expression pattern. UseRejectSSLDN supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseRejectSSLDN=Y</p>
UseRejectUserID	<p>UseRejectUserID allows MQ Admin to reject incoming UserID by comparing it against a regular expression pattern. UseRejectUserID supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseRejectUserID=Y</p>
UseSSLCertUserID	<p>UseSSLCertUserID allows the connection to use the UserID value specified in the channel's SSLCertUserID field. UseSSLCertUserID supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseSSLCertUserID=Y</p>
UseSSLUserIDFromDN	<p>UseSSLUserIDFromDN specifies to set the channel's UserId to be the value extracted from the SSL DN. UseSSLUserIDFromDN supports 2 values [Y / N]. The default value is N.</p> <p>e.g. UseSSLUserIDFromDN=Y</p>
WriteToEventQueue	<p>WriteToEventQueue specifies if MQAUSX will write an event message containing the log entry information to an event queue. WriteToEventQueue supports 2 values [Y / N]. The default value is N.</p> <p>e.g. WriteToEventQueue=Y</p>

Keyword	Description of Server-side keywords
WriteToSystemLog	<p>WriteToSystemLog specifies that MQAUSX write a log entry to the server's 'logging system'. On z/OS, the server's 'logging system' is JES. WriteToSystemLog supports 2 values [Y / N]. The default value is N.</p> <p>e.g. WriteToSystemLog =Y</p>

8 Appendix B – z/MQAUSX Upgrade Procedures

To upgrade an existing installation of z/MQAUSX from an older version to a newer version, do please do the following in the appropriate section below.

1. Stop all of the channels using the z/MQAUSX server-side security exit or stop the queue manager's CHIN (channel initiator).
2. ftp the z/OS XMIT prepared datasets to the z/OS LPAR.

ftp -s:mqausx.ftp z/os_hostname

```
your-z/OS-userid
your-z/OS-password

binary
quote SITE recfm=fb lrecl=80 blksize=3120
put MQAUSX.LOAD.ZOS
quit
```

If the user receives the following error message then they will need to pre-allocate the z/OS datasets:

```
ftp> put MQAUSX.LOAD.ZOS
200 Port request OK.
550-SVC99 RETURN CODE=4 S99INFO=0 S99ERROR=38656 HEX=9700 S99ERSN code X'000003F3'.
550 Unable to create data set xxxxx.MQAUSX.LOAD.ZOS for STOR command.
ftp> put MQAUSX.SYSIN.ZOS
200 Port request OK.
550-SVC99 RETURN CODE=4 S99INFO=0 S99ERROR=38656 HEX=9700 S99ERSN code X'000003F3'.
550 Unable to create data set xxxxx.MQAUSX.SYSIN.ZOS for STOR command.
```

To pre-allocating the XMIT datasets go to option 3.2 of ISPF and allocate both dataset: MQAUSX.LOAD.ZOS

Use the following dataset attributes when allocating the dataset:

Space	
Units	BLOCKS
Primary Quantity	40
Secondary Quantity	40
Directory Blocks	0
DCB Parameters	
RECFM	FB
LRECL	80
BLKSIZE	3120
DsnType	Blank

After the user has pre-allocated the dataset, the user can redo the ftp commands.

3. Log on to z/OS LPAR and issue the following TSO RECEIVE command:

TSO RECEIVE INDATASET(MQAUSX.LOAD.ZOS)

After issuing the above command, the following product dataset will appear:

- **+HLQ+.CPTLWARE.MQAUSX.LOAD** is the dataset that contains the z/OS load-module.
4. Start all of the channels using the z/MQAUSX server-side security exit or restart the queue manager's CHIN.

9 Appendix C - FBA Encrypted File

The user can create a file that will contain the UserID and encrypted Password. The *encsrvr* program is used to create and manage a file that will contain the server-side UserID and encrypted Password. Enc_server functions a lot like the Unix programs: adduser, rmuser and passwd but all combined together. encsrvr uses the same Unix crypt method as the Unix *passwd* program to encrypt the password. The encsrvr's file format is very similar to the Unix */etc/shadow* password file.

Syntax:

```
encsrvr {-a | -d | -r} -u UserId -p Password [-f outfilename]
```

Where :

- -a specifies that a UserID and Password are to be added to the file
- -d specifies that a UserID and Password are to be deleted from the file
- -r specifies that a UserID and Password are to be replaced in the file
- UserId is the user's remote UserID (remote Logon ID)
- Password is the user's Password to be encrypted
- outfilename is the output file DD name (optional)

9.1 Examples

9.1.1 z/OS

Add a UserId & Password:

```
//ENCSRVR EXEC PGM=ENCSRVR,PARM='-a -u barney -p bedrock -f FBAENC'  
//SYSPRINT DD SYSOUT=*  
//FBAENC DD DISP=SHR,DSN=MY.SEQ.DATA
```

Delete a UserId & Password:

```
//ENCSRVR EXEC PGM=ENCSRVR,PARM='-d -u barney -f FBAENC'  
//SYSPRINT DD SYSOUT=*  
//FBAENC DD DISP=SHR,DSN=MY.SEQ.DATA
```

Replace a UserId & Password:

```
//ENCSRVR EXEC PGM=ENCSRVR,PARM='-r -u barney -p bedrock -f FBAENC'  
//SYSPRINT DD SYSOUT=*  
//FBAENC DD DISP=SHR,DSN=MY.SEQ.DATA
```

10 Appendix D – Capitalware Product Display Version

z/MQAUSX includes a program to display the product version number.

10.1 Examples

10.1.1 z/OS

To use the CWDSPVER program on z/OS, use the following JCL:

```
//CWDSPVER EXEC PGM=CWDSPVER,  
//SYSPRINT DD SYSOUT=*  
//STEPLIB DD DISP=SHR,DSN=+HLQ+.CPTLWARE.MQAUSX.LOAD
```

11 Appendix E – Encryption

MQ Authenticate User Security Exit for z/OS Solution uses the ‘Tiny Encryption Algorithm Variant’ (called TEAV or XTEA) for encryption and decryption of the user’s password between the client-side security exit and the server-side security exit.

11.1 TEA Encryption Algorithm

This is relatively new, sufficiently strong and very compact and fast block cipher algorithm with a 128-bit key. It is not patented and is available in public domain.

Initially, the *Tiny Encryption Algorithm* (TEA) was developed by David Wheeler and Roger Needham of Cambridge University Computer Lab, UK, in 1994:
<http://www.ftp.cl.cam.ac.uk/ftp/papers/djw-rmn/djw-rmn-tea.html>

Later it was enhanced and renamed

- Block TEA, XTEA or TEAN, 1997:
<http://www.ftp.cl.cam.ac.uk/ftp/users/djw3/xtea.ps>

- And XXTEA, 1998:
<http://www.ftp.cl.cam.ac.uk/ftp/users/djw3/xxtea.ps>

The review, cryptanalysis, summary of attacks and discussion is presented by Matthew D. Russell in ‘An Overview of TEA and Related Ciphers’, 2004:
<http://www-users.cs.york.ac.uk/~matthew/TEA/TEA.html>

Also see the *Tiny Encryption Algorithm* website maintained by Simon Shepherd, Professor of Computational Mathematics, Director of the Cryptography and Computer Security Laboratory, Bradford University, England:
<http://www.simonshepherd.supanet.com/tea.htm>

12 Appendix F – Support

The support for MQ Authenticate User Security Exit for z/OS can be found at the following location:

Online Help Desk Ticketing System at
www.capitalware.biz/phpst/

By email at:
support@capitalware.biz

By regular mail at:

Capitalware Inc.
Attn: MQAUSX for z/OS Support
1673 Richmond Street, Suite 524
London, Ontario N6G2N3
Canada

13 Appendix G – Summary of Changes

- MQ Authenticate User Security Exit v1.5.0
 - Added UseSSLCertUserID IniFile keyword to enable the use of the UserID from the channel's SSLCertUserID field
 - Added AllowSSLSSCert IniFile keyword to enable the check for Self-signed Certificate
 - Added UseSSLUserIDFromDN, SSLDNAttrName, SSLDNAttrStartPos and SSLDNAttrLength IniFile keywords to extract the UserID from the channel's SSL DN field
 - Added LicenseFile to support multiple license keys in a single file
 - Fixed a bug with Proxy file processing

- MQ Authenticate User Security Exit v1.4.0
 - Major performance and tuning to many modules - a 7% - 12% improvement in speed depending on features used
 - Added *encsrvr* - it is used to create an encrypted server-side FBA file. *encsrvr* is similar/combo to the Unix programs: *useradd*, *userdel* and *passwd* including Unix *crypt*.
 - Added the ability to explicitly reject an incoming IP address based on a pattern-matching (*UseRejectIP* and *RejectIP*).
 - Added the ability to explicitly reject an incoming UserID based on a pattern-matching (*UseRejectUserID* and *RejectUserID*).
 - Added the code to disable Event Warning messages when *WriteToEventQueue* is being used.
 - Added code to limit the number of messages written to the event queue when *WriteToEventQueue* is being used.
 - Added *MCCGetTimeOut* keyword to allow the user to define how long to wait on the "DIS CHL(<ChannelName>)" command when *UseMCC* is being used.

- MQ Authenticate User Security Exit v1.3.0
 - Created new CHAD (Channel Auto-Definition) exit so that z/MQAUSX can work with cluster channels.
 - Added the ability to filter the incoming connection request by authenticated UserID (previously it was only when *NoAuth=Y*).
 - Added the ability to write custom MQ Events to System Channel Event Queue to allow MQAUSX to be tied into an MQ Monitoring tool.
 - 9101 for Connection rejected (Authentication failed) event message
 - 9201 for MCC Warning event message
 - 9202 for MCC Exceeded event message
 - Successfully tested with WMQ v7.0
 - Fixed a bug related to uppercasing a very long UserID.

- MQ Authenticate User Security Exit for z/OS v1.2.3
 - Initial release.

14 Appendix H – License Agreement

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15 Appendix I – Notices

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