# MQ Security for z/OS

Julie Bergh
jbergh@rocketsoftware.com

# Abstract

This session will look at how basic security setup for MQ on z/OS .

How it is activated / deactivated.

What can be protected.

My opinions and not of my company

# Agenda

MQ Overview

Security Overview

Controlling Security for MQ for z/OS

Access Control / Administration  Summary

# Agenda

**MQ Overview**

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# MQ Overview

MQ – Message Queue

xxxxMSTR – MQ queue manager – xxxx equal ssid defined in SYS1.PARMLIB(IEFSSNxx)

xxxxCHIN – MQ channel initiator

MQ web server

# MQ Overview

```
%CSQ1 DISPLAY CHINIT
CSQM137I %CSQ1 CSQMDDQM  DISPLAY CHINIT COMMAND ACCEPTED
CSQX830I %CSQ1 CSQXRDQM Channel initiator active
CSQX831I %CSQ1 CSQXRDQM 8 adapter subtasks started, 8 requested
CSQX832I %CSQ1 CSQXRDQM 5 dispatchers started, 5 requested
CSQX833I %CSQ1 CSQXRDQM 0 SSL server subtasks started, 0 requested
CSQX840I %CSQ1 CSQXRDQM 0 channels current, maximum 200
CSQX841I %CSQ1 CSQXRDQM 0 channels active, maximum 200, 498
including 0 paused
CSQX842I %CSQ1 CSQXRDQM 0 channels starting, 499
0 stopped, 0 retrying
CSQX836I %CSQ1 CSQXRDQM Maximum channels - TCP/IP 200, LU 6.2 200
CSQX845I %CSQ1 CSQXRDQM TCP/IP system name is TCPIP
CSQX846I %CSQ1 CSQXRDQM TCP/IP listener INDISP=QMGR started, 502
for port 1400 address *
CSQX849I %CSQ1 CSQXRDQM LU 6.2 listener INDISP=QMGR not started
CSQ9022I %CSQ1 CSQXCRPS ' DISPLAY CHINIT' NORMAL COMPLETION
```

# MQ Overview

- Connections
- Commands
- Queues
- Queue context
- Alternate userid
- Topics
- Processes
- Namelists

# Agenda

MQ Overview

**Security Overview**

Controlling Security for MQ for z/OS

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# MQ Security Overview – RACF classes

- MQ Member (Group) Upper Case Classes
  - *MQADMIN (GMQADMIN)*
  - *MQQUEUE (GMQQUEUE)*
  - *MQPROC (GMQPROC)*
  - *MQNLIST (GMQNLIST) MQCONN*
  - *MQCMDS*
- Only will talk to upper case classes

- MQ Member (Group) Mixed Case Classes
  - *MXADMIN (GMXADMIN)*
  - *MXQUEUE (GMXQUEUE)*
  - *MXPROC (GMXPROC)*
  - *MXNLIST (GMXNLIST)*
  - *MXTOPIC (GMXTOPIC)*
- No versions of MX for MQCONN and MQCMDS

# MQ Security Overview – RACF Classes

- MQADMIN
  - Administrative control
  - Alternate user profiles
  - Context control
  - RESLEVEL
  - Switch

- MQCONN - Connections
- MQCMDS - Commands
- MQQUEUE - Queues
- MXTOPIC - Topics
- MQPROC - Processes
- MQNLIST - Namelists

# MQ Security Overview – Check list

- Activate and RACLIST the RACF MQADMIN class.
- Check your switch settings.
- Do you need security on any of the following:
  - Connections
  - Checking on command
  - Resource used in the commands
  - Queues
  - Processes
  - Namelist
  - Topic Security

# MQ Security Overview – Check list (continued)

- Other potential security items (not covered in this session):
  - Do any users need to protect the use of the MQOPEN or MQPUT1 options relating to the use of context?
  - Do you need to protect the use of alternative user IDs?
  - Do you need to tailor which user IDs are to be used for resource security checks through RESLEVEL?
  - Do you need to 'timeout' unused user IDs from IBM MQ ?
  - Do you want to use Transport Layer Security (TLS)?
  - Do you use clients?
  - Do you send passwords from client applications?

# Agenda

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# MQ Security Implementation Considerations

- MQADMIN Class
  - Switches
  - RESLEVEL

- Profile definitions
  - HLQs (ssid)
    - Queue manager profile (qmgr.profile.name)
    - Queue sharing group profiles (qsg.profile.name)

# MQ Security Implementation Considerations

- Queue manager profile (qmgr.profile.name)
- Queue sharing group profiles (qsg.profile.name)

# MQ Security Switches – RACF Profiles

- If qmgr-name.NO.SUBSYS.SECURITY is present
  - No further security checks are performed – get out.

- If qsg-name.NO.SUBSYS.SECURITY is not found
    - Security is on and checking will start with queue managers
  - else
      - If qmgr-name.YES.SUBSYS.SECURITY is present, checking will start with queue managers
    - Else
      - No further security checks are performed – get out.

- At this point assuming at security is on and continue to next slide.

# MQ Security Switches – SUBSYS is not NO

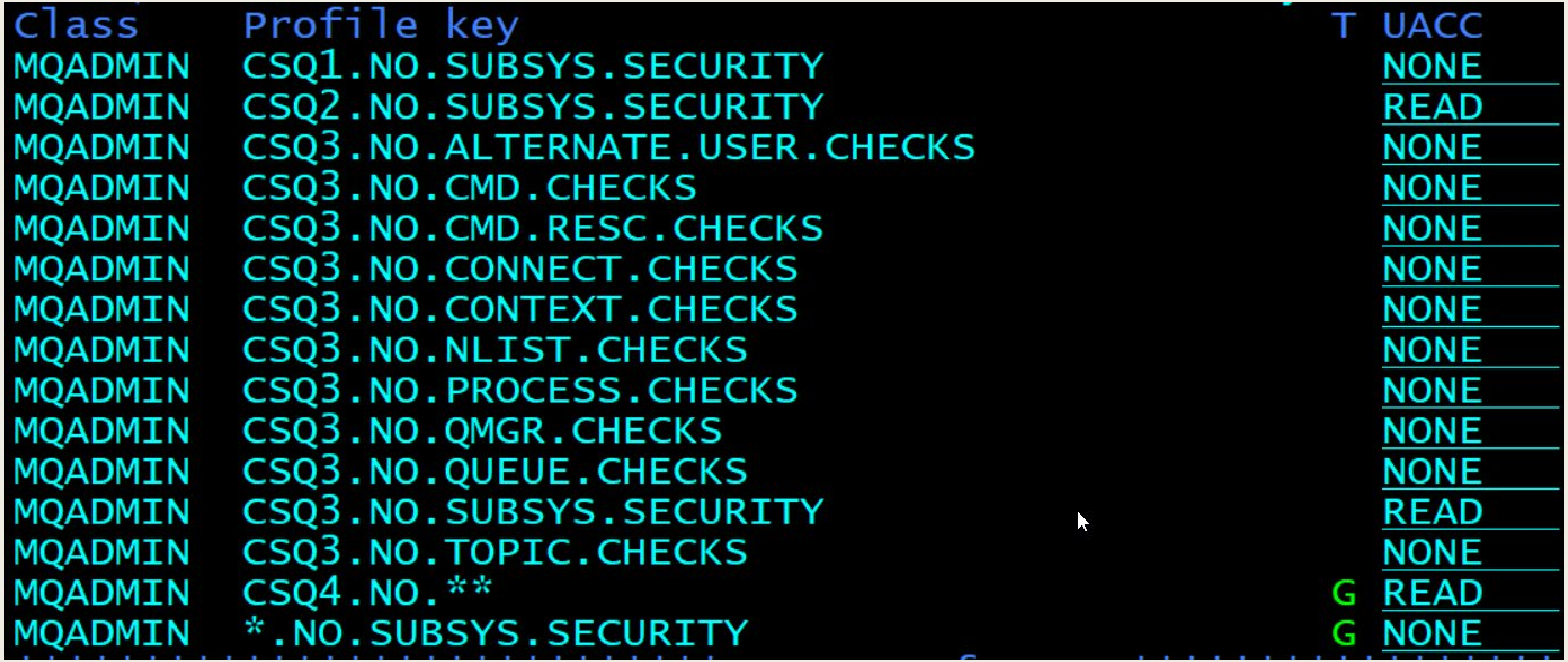
- If qmgr-name.NO.SUBSYS.SECURITY is present (e.g. CSQ1.NO.SUBSYSTEM.SECURITY)
    - No further security checks are performed – get out.

- If qsg-name.NO.SUBSYS.SECURITY is not found
        - Security is on and checking will start with queue managers
    - else
            - If qmgr-name.YES.SUBSYS.SECURITY is present, checking will start with queue managers
        - Else
            - No further security checks are performed – get out.

# MQ Security Switches – SUBSYS is not NO

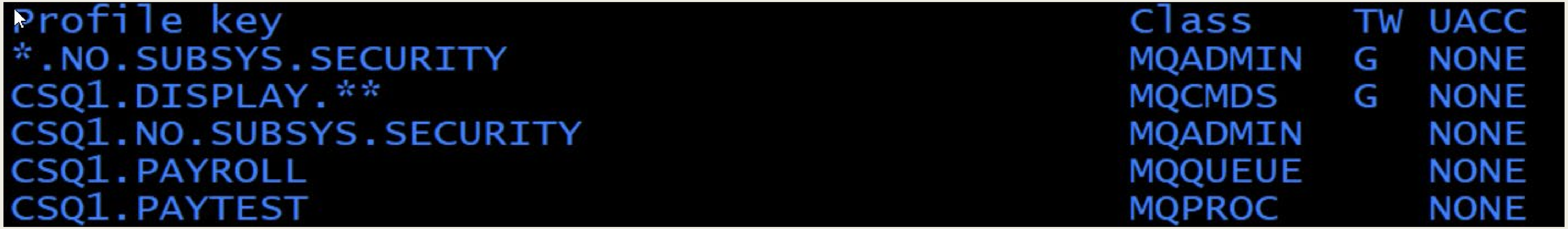
- Connections – ssid.NO.CONNECT.CHECKS
- Commands – ssid.NO.CMD.CHECKS
- Commands Resource – ssid.NO.CMD.RESC.CHECKS
- Queues – ssid.NO.QUEUE.CHECKS
- Queue context – ssid.NO.CONTEXT.CHECKS
- Alternate userid – ssid.NO.ALTERNATE.USER.CHECKS
- Topics – ssid.NO.TOPIC.CHECKS
- Processes – ssid.NO.PROCESS.CHECKS
- Namelists – ssid.NO.NLIST.CHECKS

# MQ Security Switches – SUBSYS is not NO



```
Class      Profile key                                  T UACC
MQADMIN    CSQ1.NO.SUBSYS.SECURITY                        NONE
MQADMIN    CSQ2.NO.SUBSYS.SECURITY                        READ
MQADMIN    CSQ3.NO.ALTERNATE.USER.CHECKS                  NONE
MQADMIN    CSQ3.NO.CMD.CHECKS                             NONE
MQADMIN    CSQ3.NO.CMD.RESC.CHECKS                        NONE
MQADMIN    CSQ3.NO.CONNECT.CHECKS                         NONE
MQADMIN    CSQ3.NO.CONTEXT.CHECKS                         NONE
MQADMIN    CSQ3.NO.NLIST.CHECKS                           NONE
MQADMIN    CSQ3.NO.PROCESS.CHECKS                         NONE
MQADMIN    CSQ3.NO.QMGR.CHECKS                            NONE
MQADMIN    CSQ3.NO.QUEUE.CHECKS                           NONE
MQADMIN    CSQ3.NO.SUBSYS.SECURITY                        READ
MQADMIN    CSQ3.NO.TOPIC.CHECKS                           NONE
MQADMIN    CSQ4.NO.**                                   G READ
MQADMIN    *.NO.SUBSYS.SECURITY                         G NONE
```

# MQ Security Switches



```
Profile key                                  Class    TW UACC
*.NO.SUBSYS.SECURITY                         MQADMIN  G  NONE
CSQ1.DISPLAY.**                              MQCMDS   G  NONE
CSQ1.NO.SUBSYS.SECURITY                      MQADMIN     NONE
CSQ1.PAYROLL                                 MQQUEUE     NONE
CSQ1.PAYTEST                                 MQPROC      NONE
```

# MQ Security Switches – SUBSYS is not NO

```
%CSQ1 DISPLAY SECURITY ALL
CSQH015I %CSQ1 Security timeout = 54 minutes
CSQH016I %CSQ1 Security interval = 12 minutes
CSQH037I %CSQ1 Security using uppercase classes
CSQH030I %CSQ1 Security switches ...
CSQH031I %CSQ1 SUBSYSTEM: OFF, ‘CSQ1.NO.SUBSYS.SECURITY' found
CSQH040I %CSQ1 Connection authentication ...
CSQH041I %CSQ1 Client checks: OPTIONAL
CSQH042I %CSQ1 Local bindings checks: OPTIONAL
CSQ9022I %CSQ1 CSQHPDTC ' DISPLAY SECURITY' NORMAL COMPLETION
```

# MQ QMGR Security Messages

```
%CSQ1 CSQHINSQ Security using uppercase classes
%CSQ1 CSQHINSQ SUBSYSTEM security switch set ON, profile ‘CSQ1.NO.SUBSYS.SECURITY' not found
%CSQ1 CSQHINSQ QMGR security switch set ON, profile ‘CSQ1.YES.QMGR.CHECKS' found
%CSQ1 CSQHINSQ QSG security switch set OFF, profile 'SQ05.NO.QSG.CHECKS' found
%CSQ1 CSQHIS1C CONNECTION security switch set OFF, profile 'CSQ1.NO.CONNECT.CHECKS' found
%CSQ1 CSQHIS1C COMMAND security switch set ON, profile 'CSQ1.NO.CMD.CHECKS' not found
%CSQ1 CSQHIS1C CONTEXT security switch set OFF, profile 'CSQ1.NO.CONTEXT.CHECKS' found
%CSQ1 CSQHIS1C ALTERNATE USER security switch set ON, profile '
CSQ1.NO.ALTERNATE.USER.CHECKS' not found
%CSQ1 CSQHIS1C COMMAND RESOURCES security switch set OFF, profile 'CSQ1.NO.CMD.RESC.CHECKS'
found
%CSQ1 CSQHIS1C PROCESS security switch set ON, profile 'CSQ1.NO.PROCESS.CHECKS' not found
%CSQ1 CSQHIS1C NAMELIST security switch set ON, profile 'CSQ1.NO.NLIST.CHECKS' not found
%CSQ1 CSQHIS1C QUEUE security switch set ON, profile 'CSQ1.NO.QUEUE.CHECKS' not found
%CSQ1 CSQHIS1C TOPIC security switch set ON, profile 'CSQ1.NO.TOPIC.CHECKS' not found
```

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# MQ Security Overview – Check list

- Activate and RACLIST the RACF MQADMIN class.

- Check your switch settings.

- Do you need security on any of the following:
  - Connections
  - Checking on command
  - Resource used in the commands
  - Queues
  - Processes
  - Namelist
  - Topic Security

# MQ Security – Connections

- MQCONN
  - hlq.BATCH – batch jobs, TSO, USS,
  - hlq.CHIN – channel initiator address space userid
  - hlq.CICS – CICS address space userid
  - hlq.IMS  - IMS region userid

# MQ Security – Connections

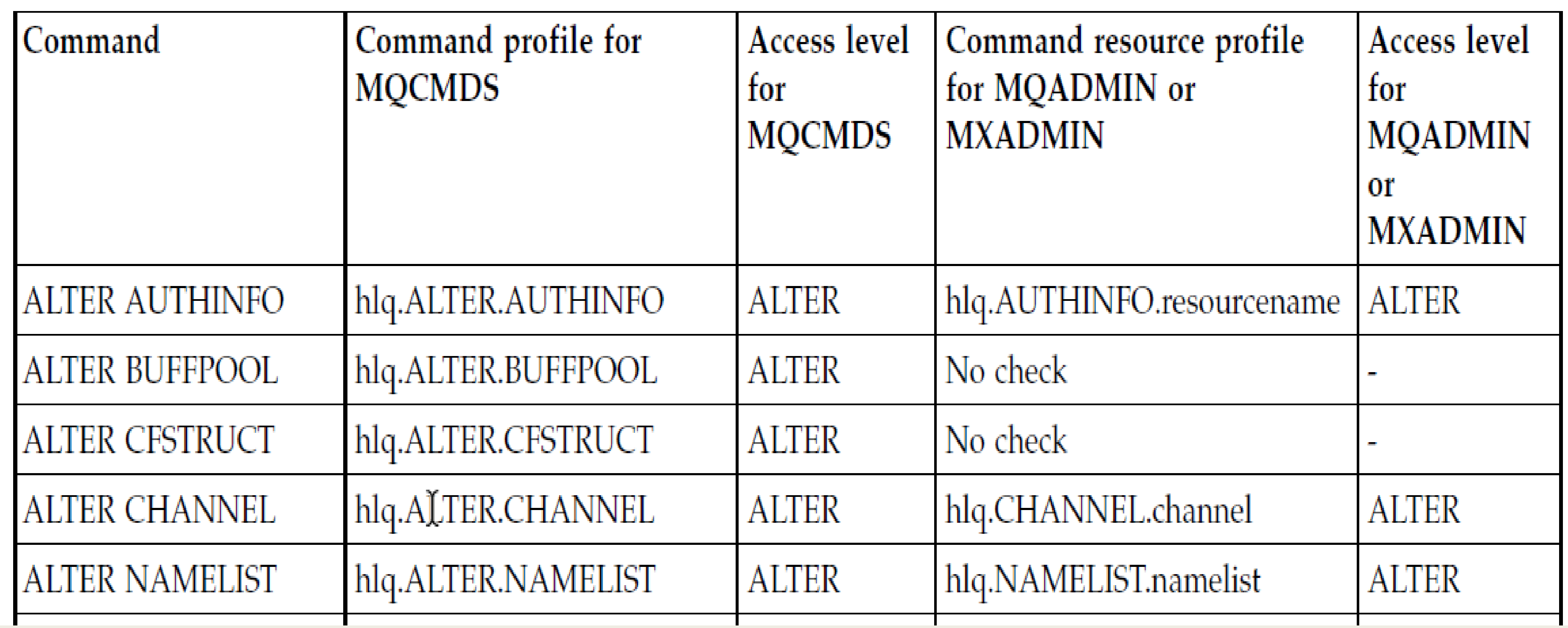
```
%CSQ1 DISPLAY CONN(*)
CSQM293I %CSQ1 CSQMDRTC 39 CONN FOUND MATCHING REQUEST CRITERIA
CSQM201I %CSQ1 CSQMDRTC  DISPLAY CONN DETAILS 551
CONN(D7DBB9B7F14C0001)
EXTCONN(C3E2D8C3C3E2D8F04040404040404040)
TYPE(CONN)
 END CONN DETAILS
CSQM201I %CSQ1 CSQMDRTC  DISPLAY CONN DETAILS 552
CONN(D7DBB9B80AF50001)
EXTCONN(C3E2D8C3C3E2D8F04040404040404040)
TYPE(CONN)
 END CONN DETAILS
CSQM201I %CSQ1 CSQMDRTC  DISPLAY CONN DETAILS 553
CONN(D7DBB9B80E150001)
EXTCONN(C3E2D8C3C3E2D8F04040404040404040)
TYPE(CONN)
```

# MQ Security – Commands & Command Resource

- MQCMD
  - Display Security
  - Refresh Security
  - Reverify Security – userid1, userid2, . . .
  - Alter Security - INTERVAL(nn) | TIMEOUT(nn)

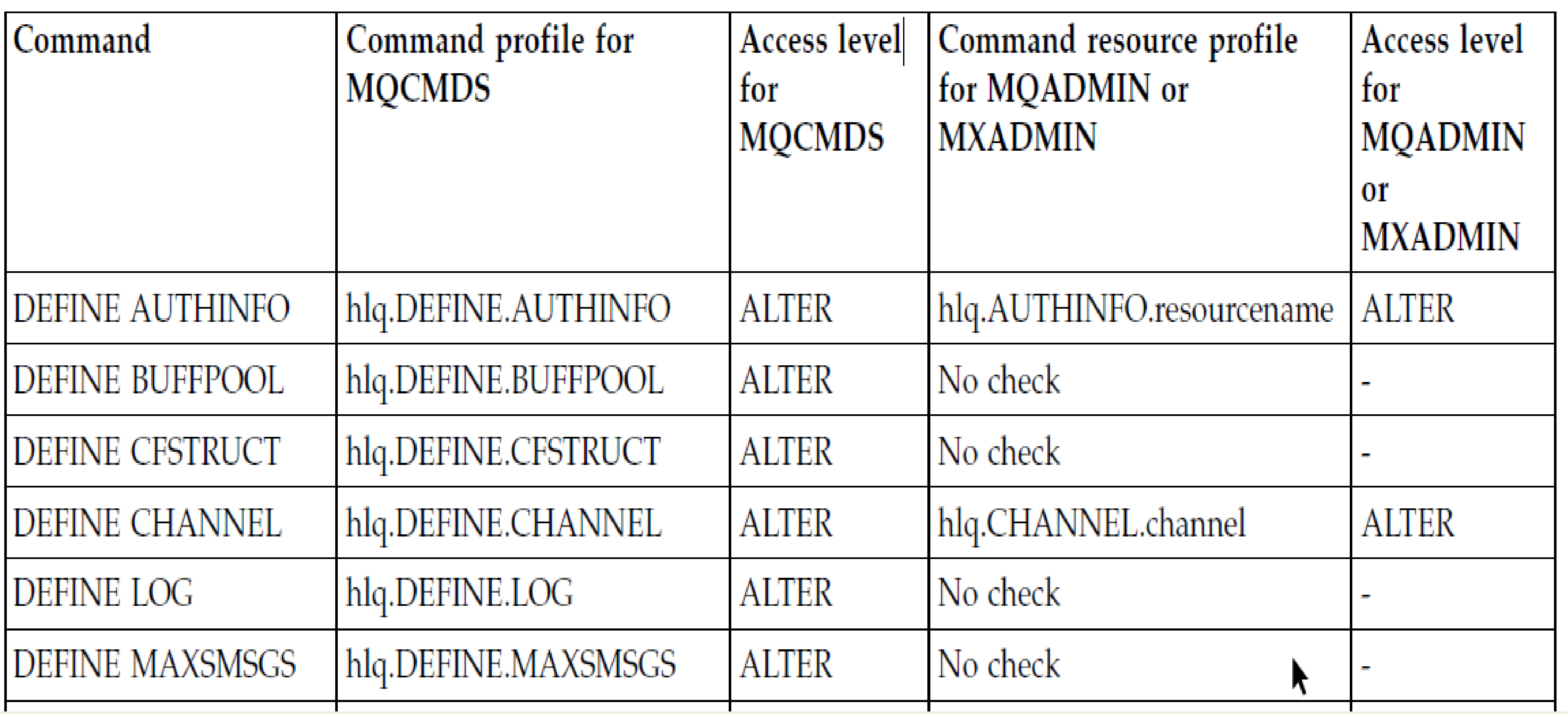
- Hundreds of commands to control.

# MQ Security – Commands & Command Resource



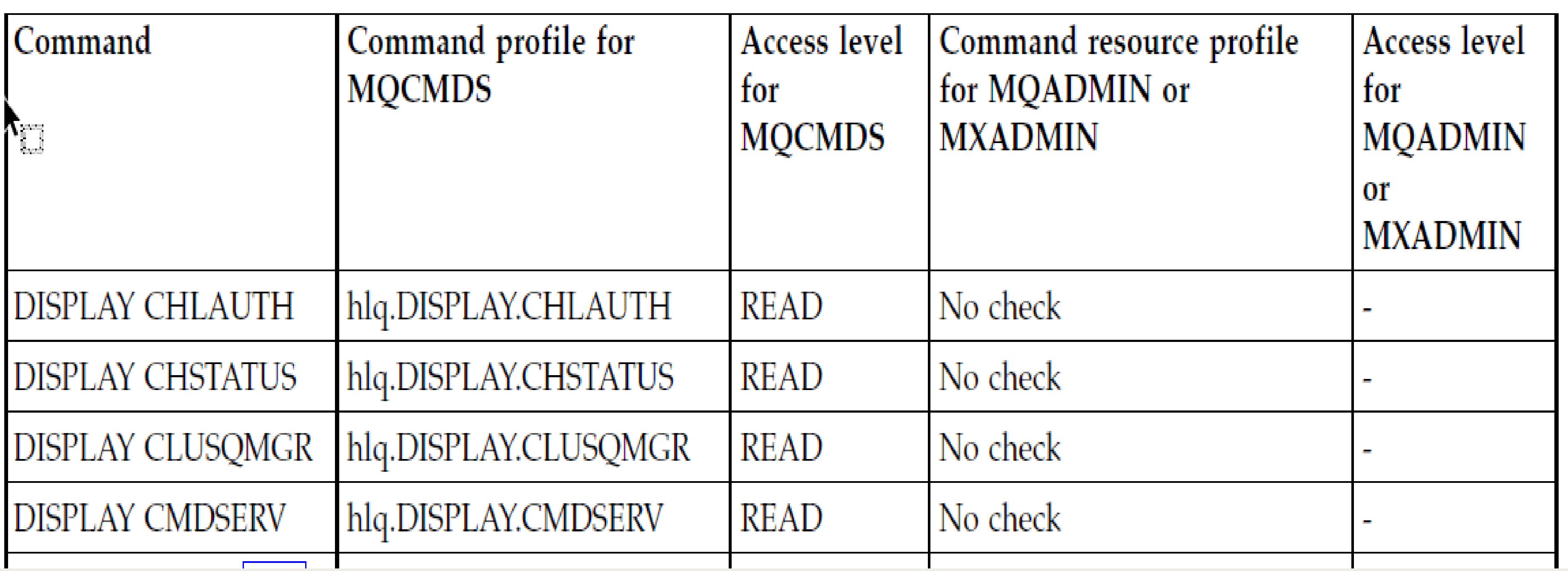
| Command | Command profile for MQCMDS | Access level for MQCMDS | Command resource profile for MQADMIN or MXADMIN | Access level for MQADMIN or MXADMIN |
|---|---|---|---|---|
| ALTER AUTHINFO | hlq.ALTER.AUTHINFO | ALTER | hlq.AUTHINFO.resourcename | ALTER |
| ALTER BUFFPOOL | hlq.ALTER.BUFFPOOL | ALTER | No check | - |
| ALTER CFSTRUCT | hlq.ALTER.CFSTRUCT | ALTER | No check | - |
| ALTER CHANNEL | hlq.ALTER.CHANNEL | ALTER | hlq.CHANNEL.channel | ALTER |
| ALTER NAMELIST | hlq.ALTER.NAMELIST | ALTER | hlq.NAMELIST.namelist | ALTER |

# MQ Security – Commands  & Command Resource



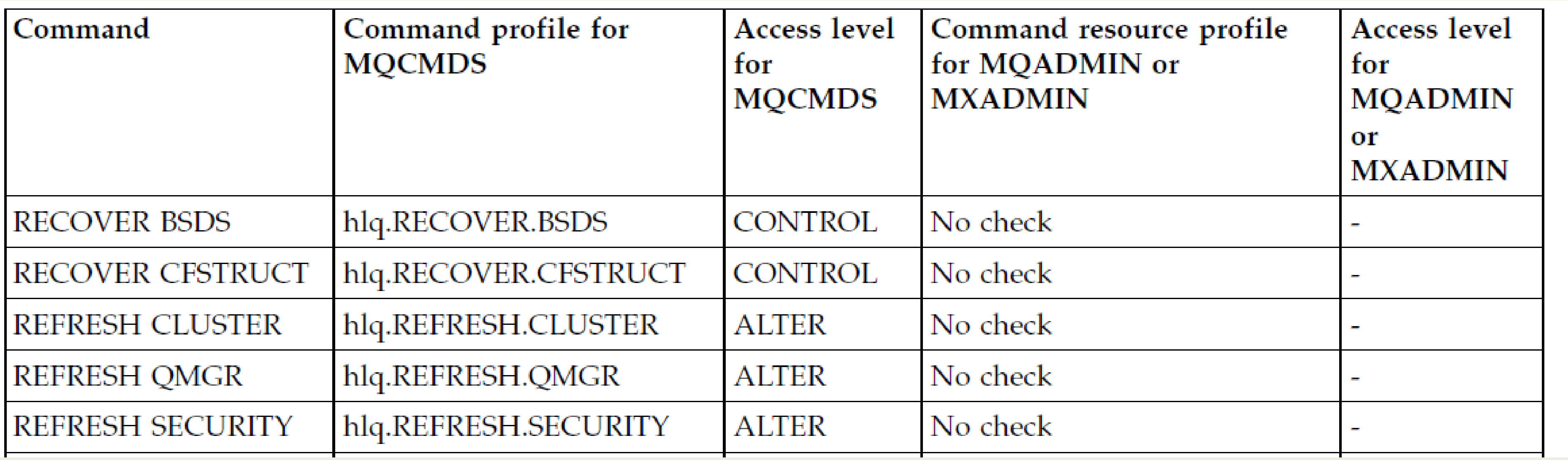
| Command | Command profile for MQCMDS | Access level for MQCMDS | Command resource profile for MQADMIN or MXADMIN | Access level for MQADMIN or MXADMIN |
|---|---|---|---|---|
| DEFINE AUTHINFO | hlq.DEFINE.AUTHINFO | ALTER | hlq.AUTHINFO.resourcename | ALTER |
| DEFINE BUFFPOOL | hlq.DEFINE.BUFFPOOL | ALTER | No check | - |
| DEFINE CFSTRUCT | hlq.DEFINE.CFSTRUCT | ALTER | No check | - |
| DEFINE CHANNEL | hlq.DEFINE.CHANNEL | ALTER | hlq.CHANNEL.channel | ALTER |
| DEFINE LOG | hlq.DEFINE.LOG | ALTER | No check | - |
| DEFINE MAXSMSGS | hlq.DEFINE.MAXSMSGS | ALTER | No check | - |

# MQ Security – Commands & Command Resource



| Command | Command profile for MQCMDS | Access level for MQCMDS | Command resource profile for MQADMIN or MXADMIN | Access level for MQADMIN or MXADMIN |
|---|---|---|---|---|
| DISPLAY CHLAUTH | hlq.DISPLAY.CHLAUTH | READ | No check | - |
| DISPLAY CHSTATUS | hlq.DISPLAY.CHSTATUS | READ | No check | - |
| DISPLAY CLUSQMGR | hlq.DISPLAY.CLUSQMGR | READ | No check | - |
| DISPLAY CMDSERV | hlq.DISPLAY.CMDSERV | READ | No check | - |

# MQ Security – Commands  & Command Resource



| Command | Command profile for MQCMDS | Access level for MQCMDS | Command resource profile for MQADMIN or MXADMIN | Access level for MQADMIN or MXADMIN |
|---|---|---|---|---|
| RECOVER BSDS | hlq.RECOVER.BSDS | CONTROL | No check | - |
| RECOVER CFSTRUCT | hlq.RECOVER.CFSTRUCT | CONTROL | No check | - |
| REFRESH CLUSTER | hlq.REFRESH.CLUSTER | ALTER | No check | - |
| REFRESH QMGR | hlq.REFRESH.QMGR | ALTER | No check | - |
| REFRESH SECURITY | hlq.REFRESH.SECURITY | ALTER | No check | - |

# MQ Security – Commands - DISPLAY

**DISPLAY SECURITY ALL|INTERVAL|SWITCHES|TIMEOUT**

**Displays the current security settings active on your queue manager. Includes a message which will show either:**

```
CSQH001I %CSQ1 CSQHINSQ Security using uppercase classes
```

**or**

```
CSQH001I %CSQ1 CSQHINSQ Security using mixed case classes
```

**Shows which security switches are ON/OFF:**

```
CSQH024I %CSQ1 CSQHIS1C TOPIC security switch set ON,
               profile  ‘CSQ1.NO.TOPIC.CHECKS' not found
```

**or**

```
CSQH021I %CSQ1 CSQHIS1C TOPIC security switch set OFF,
               profile  ‘CSQ1.NO.TOPIC.CHECKS' found
```

# MQ Security – Commands - Refresh

- **REFRESH SECURITY**
  - ***(*|MQADMIN,MQQUEUE,MQPROC,MQNLIST,MXADMIN,MXQUEUE, MXPROC,MXNLIST,MXTOPIC)***
  - ***TYPE***
    - **(CLASSES|AUTHSERV|SSL|CONNAUTH)**

- **Command Qualifier**
  - **** - default***
  - ***Class – RACF class***
  - ***Authserv – default on non z/os***
  - ***SSL - refreshes cached view of the SSL key repository, locations of LDAP servers for Certificate Name Revocation and the key repository***
  - ***CONAUTH - Refreshes the cached view of the configuration for connection authentication***

# MQ Security – Commands - DISPLAY

```
%CSQ1 REFRESH SECURITY(*)
CSQH001I %CSQ1 CSQHCHK4 Security using uppercase classes
CSQH021I %CSQ1 CSQHREFA SUBSYSTEM security switch set OFF, profile
'CSQ1.NO.SUBSYS.SECURITY' found
CSQ9022I %CSQ1 CSQHSREF ' REFRESH SECURITY' NORMAL COMPLETION

%CSQ1 REFRESH SECURITY(MQADMIN)
 CSQH001I %CSQ1 CSQHCHK4 Security using uppercase classes
 CSQH021I %CSQ1 CSQHREFA SUBSYSTEM security switch set OFF, profile
'CSQ1.NO.SUBSYS.SECURITY' found
 CSQ9022I %CSQ1 CSQHSREF ' REFRESH SECURITY' NORMAL COMPLETION

%CSQ1 REFRESH SECURITY(MQCONN)
CSQ9015E %CSQ1 Parameter 'MQCONN' is unacceptable for 'SECURITY'
CSQ9023E %CSQ1 CSQ9SCND 'REFRESH SECURITY' ABNORMAL COMPLETION

%CSQ1 REFRESH SECURITY(MQPROC)
CSQH018I %CSQ1 CSQHSREF Security refresh for 'MQPROC' not processed,
SUBSYSTEM security switch set OFF
CSQ9022I %CSQ1 CSQHSREF ' REFRESH SECURITY' NORMAL COMPLETION
```

# MQ Security – Queues

- MQQUEUE
  - hlq.queuename
- Application Queues
  - Local Queues
  - Remote Queues
  - Alias Queues
  - Model Queues
- System Queues
  - Transmission Queues
  - Dead-Letter Queue
  - Initiation Queues
  - Managed Queues

# MQ Security – Queues

```
%CSQ1 DISPLAY QUEUE(*)
CSQM293I %CSQ1 CSQMDRTC 59 QUEUE FOUND MATCHING REQUEST CRITERIA
CSQM201I %CSQ1 CSQMDRTC  DISPLAY QUEUE DETAILS 873
QUEUE(CICS01.INITQ)
TYPE(QLOCAL)
QSGDISP(QMGR)
 END QUEUE DETAILS
CSQM201I %CSQ1 CSQMDRTC  DISPLAY QUEUE DETAILS 874
QUEUE(CSQ1.DEAD.QUEUE)
TYPE(QLOCAL)
QSGDISP(QMGR)
 END QUEUE DETAILS
CSQM201I %CSQ1 CSQMDRTC  DISPLAY QUEUE DETAILS 875
QUEUE(CSQ1.DEFXMIT.QUEUE)
TYPE(QLOCAL)
QSGDISP(QMGR)
 END QUEUE DETAILS
```

# MQ Security – Queues

```
CSQM201I %CSQ1 CSQMDRTC  DISPLAY QUEUE DETAILS 878
QUEUE(SYSTEM.ADMIN.ACTIVITY.QUEUE)
TYPE(QLOCAL)
QSGDISP(QMGR)
 END QUEUE DETAILS
CSQM201I %CSQ1 CSQMDRTC  DISPLAY QUEUE DETAILS 879
QUEUE(SYSTEM.ADMIN.CHANNEL.EVENT)
TYPE(QLOCAL)
QSGDISP(QMGR)
 END QUEUE DETAILS
CSQM201I %CSQ1 CSQMDRTC  DISPLAY QUEUE DETAILS 880
QUEUE(SYSTEM.ADMIN.COMMAND.EVENT)
TYPE(QLOCAL)
```

# MQ Security – Processes

- **MQPROC**
  - ***hlq.processname***

# MQ Security – Processes

```
%%CSQ1 DISPLAY PROCESS(*)
 CSQM293I %CSQ1 CSQMDRTC 2 PROCESS FOUND MATCHING REQUEST CRITERIA
 CSQM201I %CSQ1 CSQMDRTC  DISPLAY PROCESS DETAILS 223
 PROCESS(CSQ4IVP1)
 QSGDISP(QMGR)
  END PROCESS DETAILS
 CSQM201I %CSQ1 CSQMDRTC  DISPLAY PROCESS DETAILS 224
 PROCESS(SYSTEM.DEFAULT.PROCESS)
 QSGDISP(QMGR)
  END PROCESS DETAILS
 CSQ9022I %CSQ1 CSQMDRTC ' DISPLAY PROCESS' NORMAL COMPLETION
```

# MQ Security – Name Lists

- **MQNLIST**
  - ***hlq.namelist***

# MQ Security – Name Lists

```
%CSQ1 DISPLAY NAMELIST(*)
CSQM293I %CSQ1 CSQMDRTC 3 NAMELIST FOUND MATCHING REQUEST CRITERIA
CSQM201I %CSQ1 CSQMDRTC  DISPLAY NAMELIST DETAILS 247
NAMELIST(SYSTEM.DEFAULT.NAMELIST)
NLTYPE(NONE)
QSGDISP(QMGR)
 END NAMELIST DETAILS
CSQM201I %CSQ1 CSQMDRTC  DISPLAY NAMELIST DETAILS 248
NAMELIST(SYSTEM.QPUBSUB.QUEUE.NAMELIST)
NLTYPE(QUEUE)
QSGDISP(QMGR)
 END NAMELIST DETAILS
CSQM201I %CSQ1 CSQMDRTC  DISPLAY NAMELIST DETAILS 249
NAMELIST(SYSTEM.QPUBSUB.SUBPOINT.NAMELIST)
NLTYPE(NONE)
QSGDISP(QMGR)
 END NAMELIST DETAILS
CSQ9022I %CSQ1 CSQMDRTC ' DISPLAY NAMELIST' NORMAL COMPLETION
```

# MQ Security – Topic Security

- **MXNLIST**
  - ***hlq.topic***

# MQ Security – Topic

```
%CSQ1 DISPLAY TOPIC(*)
CSQM293I %CSQ1 CSQMDRTC 5 TOPIC FOUND MATCHING REQUEST CRITERIA
CSQM201I %CSQ1 CSQMDRTC  DISPLAY TOPIC DETAILS 277
TOPIC(SYSTEM.BASE.TOPIC)
TYPE(LOCAL)
QSGDISP(QMGR)
 END TOPIC DETAILS
CSQM201I %CSQ1 CSQMDRTC  DISPLAY TOPIC DETAILS 278
TOPIC(SYSTEM.BROKER.ADMIN.STREAM)
TYPE(LOCAL)
QSGDISP(QMGR)
 END TOPIC DETAILS
CSQM201I %CSQ1 CSQMDRTC  DISPLAY TOPIC DETAILS 279
TOPIC(SYSTEM.BROKER.DEFAULT.STREAM)
TYPE(LOCAL)
QSGDISP(QMGR)
 END TOPIC DETAILS
```

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# MQ Security Overview – Check list

- Activate and RACLIST the RACF MQADMIN class.
  - ‘Backstop’ entries
  - Auditing
  - Display settings to ensure you know what is being checked.

- Check your switch settings.

- Do you need security on any of the following:
  - Connections
  - Checking on command
  - Resource used in the commands
  - Queues
  - Processes
  - Namelist

# MQ Security Switches – RACF Profiles

- If qmgr-name.NO.SUBSYS.SECURITY is present
    - No further security checks are performed – get out.

- If qsg-name.NO.SUBSYS.SECURITY is not found
        - Security is on and checking will start with queue managers
    - else
            - If qmgr-name.YES.SUBSYS.SECURITY is present, checking will start with queue managers
        - Else
            - No further security checks are performed – get out.

.

# MQ Security Switches – SUBSYS is not NO

- Connections – ssid.NO.CONNECT.CHECKS
- Commands – ssid.NO.CMD.CHECKS
- Commands Resource – ssid.NO.CMD.RESC.CHECKS
- Queues – ssid.NO.QUEUE.CHECKS
- Queue context – ssid.NO.CONTEXT.CHECKS
- Alternate userid – ssid.NO.ALTERNATE.USER.CHECKS
- Topics – ssid.NO.TOPIC.CHECKS
- Processes – ssid.NO.PROCESS.CHECKS
- Namelists – ssid.NO.NLIST.CHECKS

# MQ Security for z/OS

Julie Bergh

jbergh@rocketsoftware.com