



**QMirror/DR<sup>TM</sup> Version 1.2.0**

# **Installation and Users Guide**

**Real-time objects and data replication  
from source system to target system  
for IBM iSeries**

**First Edition (May 2021)**

This edition applies to the licensed program QMirror/DR version 1.2.0, and to all subsequent releases until otherwise indicated in the new editions. Make sure you are using the proper edition for the level of the product.

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LICENSES: Shareware

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## **(010) How to implement QMirror/DR?**

There are three parts to implement QMirror/DR:

Part 1: Configure AS400

Part 2: Configure QMirror/DR

Part 3: Do simulation test before go production

It only takes a few minutes to complete.

Go to [\(020\) Quick start](#)

## (020) Quick start

The steps to quick start QMirror/DR:

Install QMirror/DR –

1. Create AS400 user profiles for QMirror/DR
2. Install QMirror/DR
3. Configure QMirror/DR
4. Simulation Test

Execute QMirror/DR –

1. Build up library list from source AS400 libraries (command option 4)  
(to start journaling for physical files)
2. Save libraries from source AS400 and restore to target AS400 by tape  
(saving time to transfer large objects by FTP)
3. Start instance (command option 1)
4. Log monitoring (command option L)
5. Status monitoring (command option S)

Add more AS400 libraries into QMirror/DR –

1. End QMirror/DR (command option 2)
2. Add more source AS400 libraries into QMirror/DR (command option 4)  
(to start journaling for physical files)
3. Save libraries from source AS400 and restore to target AS400 by tape  
(saving time to transfer large objects by FTP)
4. Start QMirror/DR (command option 1)

Go to (100) Create AS400 user profiles for QMirror/DR

## (100) Create AS400 user profiles for QMirror/DR

1. To create an AS400 user profile 'QMIRROR' on both source and target AS400s, enter command:  

```
CRTUSRPRF USRPRF(QMIRROR) PASSWORD(xxxxxxxx) USRCLS(*USER)
SPCAUT(*ALLOBJ *JOBCTL *IOSYSCFG *SAVSYS *SECADM)
PWDEXPITV(*NOMAX)
```
2. Or use any existing user profile which owns  
**SPCAUT(\*ALLOBJ \*JOBCTL \*IOSYSCFG \*SAVSYS \*SECADM) authority**
3. **Both source and target AS400s user profile must have same name password**
4. The user profile has to have the authority to execute the following commands:  
 ADDRDBDIRE, ADDRMTJRN, ALCOBJ, CHGJOB, CHGJRN, CHGPF, CHGPFM,  
 CHGRMTJRN, CHKOBJ, CLRSVAVF, CPYF, CRTDTAATA, CRTJRN, CRTJRNRCV,  
 CRTLIB, CRTMSGQ, DLTDTAARA, DLTDF, DLTJRNRCV, DLTOBJ, ENDJRNPF,  
 MOV OBJ, RNMOBJ, RSTLIB, RSTOBJ, SAVLIB, SAVOBJ, SAVSECDTA, SNDJRNE,  
 STRJRNPF
5. If you are using non-ASCII character set, the AS400 user profile CCSID for QMirror/DR should not be 65535
6. If QMirror/DR is running, you have to reboot QMirror/DR after you changed the password of AS400 user profile for QMirror

Go to [\(110\) Check AS400 configuration](#)

## (110) Check AS400 configuration

Normally, QMirror/DR should run well under common AS400 configuration. If you have a slow replication speed, you will need to check or tune your AS400 configuration.

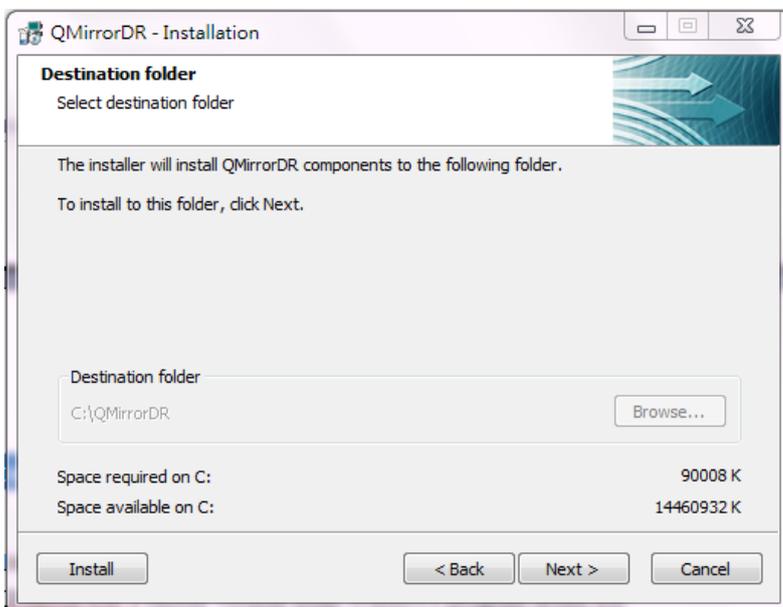
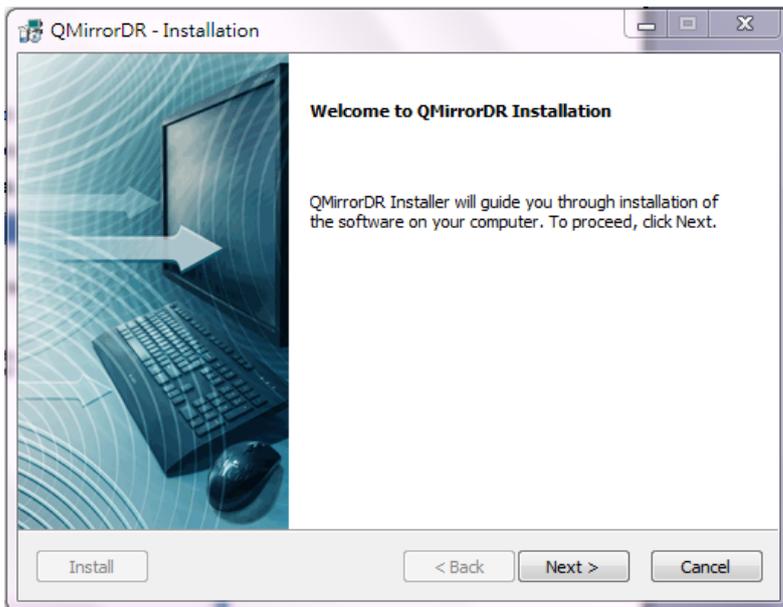
Please refer to the following paragraphs to check with your AS400 configuration. Watch the QMirror/DR performance status and tune accordingly.

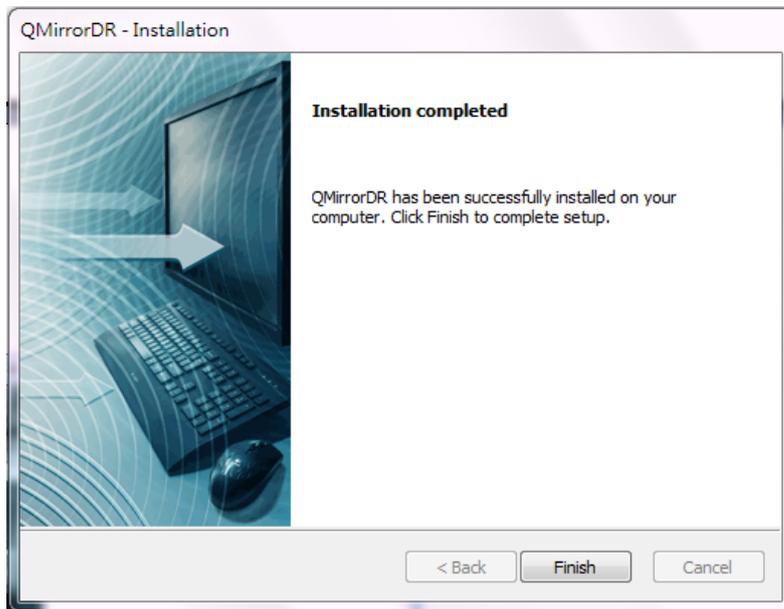
1. Use command `STRTCPSVR` to start FTP server and DDM server.
2. Manage access using FTP exit programs.  
You can provide additional security by adding FTP exit programs to further restrict FTP access to your AS400. Please refer to  
<http://publib.boulder.ibm.com/iserics/v5r2/ic2924/index.htm?info/rzaiq/rzaiqftpcon.htm>
3. Use command `DSPUSRPRF QUSER` to verify that the user's status is `*ENABLED`.
4. Use command `STRHOSTSVR *ALL` to start the optimized host server daemons.
5. Amend `QZDASOINIT/QUSER` PJ jobs back to normal priority.
  - a) `QZDASOINIT` runs priority based on `QSYS/QPWFSERVER *CLS`
  - b) Default value = 20
  - c) Use command `CHGCLS CLS(QPWFSERVER) RUNPTY(20)`
  - d) Restart `QSERVER` subsystem
6. Use command  
`CHGPJE SBSDB(OSYSWRK) PGM(OSQSRVR) MAXJOBS(*NOMAX)`  
to set SQL maximum number of jobs to `*NOMAX`. You might refer to  
[https://www.ibm.com/support/knowledgecenter/ssw\\_ibm\\_i\\_73/rzaiq/rzaiqrefere\\_nceexit.htm](https://www.ibm.com/support/knowledgecenter/ssw_ibm_i_73/rzaiq/rzaiqrefere_nceexit.htm)
7. Tune AS400 server for Java SQL Database access. Please refer to  
<http://archive.midrange.com/java400-l/200210/msg00036.html>
8. QMirror/DR needs these ports for the connection to AS400 - 23, 446, 449, 8470, 8471, 8472, 8473, 8474, 8475, 8476.

Go to [\(200\) Install QMirror/DR](#)

## (200) Install QMirror/DR

1. Download QMirror\_DR\_120.zip from <http://www.qmirror.com>
2. Uninstall QMirror/DR's earlier version from Windows program menu list
3. Unzip, execute QMirror\_DR\_120.exe, and follow the instructions





4. A program menu 'QMirror DR' will be created on Windows
5. Execute QMirror/DR from program menu list
6. Or execute QMirror/DR on a DOS prompt  
E.g. c:\QMirrorDR\qmirror.bat

Check QMirror/DR directory properties is necessary for some editions of Windows.  
Make sure all users own full control permissions of QMirror/DR directory on security folder.

Go to (210) Configure QMirror/DR

## (210) Configure QMirror/DR

### 1. Accept the terms of the license agreement

```
Accept the terms of the license agreement? (y/N/q) y
```

### 2. Source AS400 IP Address or Hostname

### 3. AS400 User ID

### 4. AS400 Working Library (default is 'QMIRROR')

### 5. Target AS400 IP Address or Hostname

### 6. Target AS400 User ID is ready? (must be the same as the source AS400 user ID)

### 7. QMirror/DR License Key

### 8. Select Character Set

```
Character Set: (1-ASCII 2-DBCS/Unicode Others)
```

### 9. Set Default CCSID if the Character Set is DBCS/Unicode

### 10. Maximum Transfer Threads

### 11. Output Queue Backup Gap

### 12. Message handling

```
Email Messages: (N-None E-Error only W-Error and Warning) e
Email Message is Error only (y/N/q) y

Email SMTP Host: (E.g. qmirror.com) qmirror.com
Email SMTP Host is qmirror.com (y/N/q) y

Email Address: (E.g. webmaster@qmirror.com; john@abc.com) admin@qmirror.com
Email Address is admin@qmirror.com (y/N/q) y

Try to send a test mail to admin@qmirror.com ...
The test mail was sent successfully.
```

### 13. Configuration Description

Go to [\(220\) About QMirror/DR internal SQLite database](#)

## **(220) About QMirror/DR internal SQLite database**

QMirror uses SQLite as its internal database. The database is located at  
c:\QMirrorDR\QMIRROR\_DR.db

To browse or change data on SQLite database, please install 'DB Browser for SQLite'.

For more information, please visit the website at <http://sqlitebrowser.org>

Go to [\(300\) Simulation Test](#)

## (300) Simulation Test

Simulation test is a well designed function for you to quickly review QMirror/DR in a few minutes. Execute Simulation Test requires QMirror/DR library list to be empty. To empty QMirror/DR library list, take command option 3 – ‘Remove libraries from library list’.

Simulation test uses the following AS400 commands to build up simulation environments:

CRTLIB, CRTDTAARA, CRTSRCPF, ADDPFM, CPYF, CRTPF, CRTLF, MOVOBJ, CHGOBJD, CRTCLPGM, and SQL statements to INSERT, UPDATE physical file.

Start QMirror/DR, take command option T – ‘Simulation test’

```

20xx/xx/xx 10:01:23 Login AS400 at xxx.xxx.xxx.xxx ...
20xx/xx/xx 10:01:31 Timer Synchronizing
20xx/xx/xx 10:02:04 AS400 - Serial number xxxxxxxx Model xxx
20xx/xx/xx 10:02:04 OS400 - Version x Release x Modification x
20xx/xx/xx 10:02:04 Target AS400 - Serial number xxxxxxxx Model xxx
20xx/xx/xx 10:02:04 Target OS400 - Version x Release x Modification x
20xx/xx/xx 10:02:04 QMirror working library on AS400 is QMIRROR
20xx/xx/xx 10:02:05 QMirror working library on target AS400 is QMIRROR

QMirror/DR x.x.x (released in 20xx/xx) command list (QMDR):
 1 - Start QMirror/DR
 4 - Build up object list from source AS400 libraries
 6 - Show selected library list
 7 - Show excluded object list
 8 - ENDJRNPf unselected libraries
 K - Change license key
 R - Switch to recovery mode
 T - Simulation test
 U - Uninstall QMirror/DR
 Q - Quit
Your option is (1/4/5/6/7/8/k/r/t/u/Q) t
    
```

QMirror/DR will create two libraries, DR001 and DR002. Then build up simulation data in both libraries.

```

Build up simulation data

CRTLIB      - Create library DR001
CRTLIB      - Create library DR002

CRTDTAARA   - Create data area dtaara101 on library DR001
CRTDTAARA   - Create data area dtaara202 on library DR002

CRTSRCPF    - Create source physical file QCLPSRC on library DR001
ADDPFM      - Add source physical file member CLP101 to QCLPSRC
              Insert CLP statements into source CLP101
CPYF        - Copy source member CLP101 to CLP102

CRTSRCPF    - Create source physical file QDDSSRC on library DR001
ADDPFM      - Add source physical file member FILE101 to QDDSSRC
              Insert DDS statements into source FILE101
CRTPF       - Create physical file FILE101 from DDS on library DR001
              Insert 5 records into FILE101

ADDPFM      - Add source physical file member FILE101_LF to QDDSSRC
              Insert DDS statements into source FILE101_LF
CRTLF       - Create logical file FILE101_LF from DDS on library DR001

Done.
    
```

You can use PDM to review object list in libraries DR001 and DR002.

```

Work with Objects Using PDM

Library . . . . . DR001          Position to . . . . .
                               Position to type . . . . .

Type options, press Enter.
  2=Change      3=Copy      4=Delete      5=Display      7=Rename
  8=Display description  9=Save      10=Restore     11=Move ...

Opt Object      Type      Attribute  Text
FILE101        *FILE     PF-DTA    Physical file 101
FILE101_LF     *FILE     LF        Logical file for FILE101
QCLPSRC        *FILE     PF-SRC
QDDSSRC        *FILE     PF-SRC
DTAARA101     *DTAARA    Text of dtaara101

Parameters or command
===>
F3=Exit        F4=Prompt      F5=Refresh    F6=Create
F9=Retrieve     F10=Command entry  F23=More options  F24=More keys
    
```

### Take command option 4 – ‘Build up object list from source AS400 libraries’

```

Please take the following steps:
  Take a look at QMirror/DR simulation test data on your AS400
  Use command option 4 to build up object list from library DR001 and DR002

QMirror/DR x.x.x (released in 20xx/xx) command list (QMDR):
  1 - Start QMirror/DR
  4 - Build up object list from source AS400 libraries
  6 - Show selected library list
  7 - Show excluded object list
  8 - ENDJRNPf unselected libraries
  K - Change license key
  R - Switch to recovery mode
  Q - Quit
Your option is (1/4/5/6/7/8/k/r/Q) 4
    
```

### Build up object list from library DR001 and DR002.

```

Auto-select new libraries from source AS400 to target AS400? (y/N) n
  New libraries auto-select disabled

Build up object list from source AS400 to target AS400 -
Enter source AS400 library name (*ALLUSR/generic*/name): dr001
Replicate from source libraries DR001 (y/N/q) y

DR001      selected. Analyzing...

OBJ        TYPE      SIZE(Kb)  TEXT
-----
DTAARA101  *DTAARA          9  Text of dtaara101
QCLPSRC    *FILE            58
FILE101    *FILE            91  Physical file 101
QDDSSRC    *FILE            58
FILE101_LF *FILE            29  Logical file for FILE101
FILE101    *FILE            13  member FILE101
QCLPSRC    *FILE            9   member CLP101
QCLPSRC    *FILE            9   member CLP102
QDDSSRC    *FILE            9   member FILE101
QDDSSRC    *FILE            9   member FILE101_LF

Library DR001 has 10 objects/members, 0Mb
Total needs to transfer 10 objects/members, 0Mb

Build up object list from source AS400 to target AS400 -
Enter source AS400 library name (*ALLUSR/generic*/name): (DR001/q) dr002
Replicate from source libraries R002 (y/N/q) y

DR002      selected. Analyzing...

OBJ        TYPE      SIZE(Kb)  TEXT
-----
DTAARA202  *DTAARA          9  Text of dtaara202

Library DR002 has 1 objects/members, 0Mb
Total needs to transfer 11 objects/members, 0Mb

Build up object list from source AS400 to target AS400 -
Enter source AS400 library name (*ALLUSR/generic*/name): (DR002/q) q

Done.
    
```

### Use command 1 – ‘Start QMirror/DR’

```

Please take command option 1 to start QMirror/DR

QMirror/DR x.x.x (released in 20xx/xx) command list (QMDR):
 1 - Start QMirror/DR
 3 - Remove libraries from library list
 4 - Build up object list from source AS400 libraries
 6 - Show selected library list
 7 - Show excluded object list
 8 - ENDJRNPF unselected libraries
 K - Change license key
 R - Switch to recovery mode
 U - Uninstall QMirror/DR
 Q - Quit
Your option is (1/3/4/5/6/7/8/k/r/u/Q) 1
    
```

QMirror/DR will create libraries DR001 and DR002 on target AS400 and start to transfer objects from source AS400.

```

20xx/xx/xx 10:05:09 End instance QMDR if running ...
20xx/xx/xx 10:05:14 W103: QMirror/DR license will expire at the end of this month
20xx/xx/xx 10:05:14 Please extend your QMirror/DR license on www.qmirror.com
20xx/xx/xx 10:05:14
20xx/xx/xx 10:05:14 QMirror/DR x.x.x start up (QMDR) ...
20xx/xx/xx 10:05:14 AS400 - Serial number xxxxxxxx Model xxx
20xx/xx/xx 10:05:14 OS400 - Version x Release x Modification x
20xx/xx/xx 10:05:14 QMirror working library on AS400 is QMIRROR
20xx/xx/xx 10:05:14 Check target AS400 FTP status ...
20xx/xx/xx 10:05:15 Target AS400 FTP threads enabled
20xx/xx/xx 10:05:15 Check AS400 FTP status ...
20xx/xx/xx 10:05:16 AS400 FTP threads enabled
20xx/xx/xx 10:05:16 Journal status verification ...
20xx/xx/xx 10:05:16 Total 2 libraries ...
20xx/xx/xx 10:05:17 Building AS400 connections
20xx/xx/xx 10:05:21 Transfer threads started
20xx/xx/xx 10:05:26 Journal thread QMIRROR/JRN started
20xx/xx/xx 10:05:26 Initiating AS400 journaling ...
20xx/xx/xx 10:05:26 Mirror start from 20xxxxxx/100500
20xx/xx/xx 10:05:26 Reorganize working library ...
20xx/xx/xx 10:05:27 Transfer - DR001/QCLPSRC *FILE
20xx/xx/xx 10:05:27 Transfer - DR001/FILE101 *FILE
20xx/xx/xx 10:05:28 Transfer - DR001/QDDSSRC *FILE
20xx/xx/xx 10:05:35 Transfer - DR001/DTAARA101 *DTAARA
20xx/xx/xx 10:05:35 Transfer - DR002/DTAARA202 *DTAARA
20xx/xx/xx 10:05:35 Transfer - DR001/FILE101/FILE101
20xx/xx/xx 10:05:35 Transfer - DR001/QCLPSRC/CLP101
20xx/xx/xx 10:05:36 Transfer - DR001/QCLPSRC/CLP102
20xx/xx/xx 10:05:36 Transfer - DR001/QDDSSRC/FILE101
20xx/xx/xx 10:05:37 Transfer - DR001/QDDSSRC/FILE101_LF
20xx/xx/xx 10:05:47 Transfer - DR001/FILE101_LF *FILE
20xx/xx/xx 10:05:48 Mirror preparing ...
20xx/xx/xx 10:06:01 Mirror threads started
20xx/xx/xx 10:06:05 Delay 6 secs. From 20xxxxxx/100500 to 100559
20xx/xx/xx 10:06:05 Replication now is up-to-date
    
```

Simulation test continues to create and change objects on source AS400. Physical file DR001/FILE001 will be inserted with more records and changes.

```

Continue simulation test

CRTDTAARA - Create dataarea dtaara102 on library DR001
CRTDTAARA - Create dataarea dtaara103 on library DR001
20xx/xx/xx 10:06:16 Transfer - QMIRROR/QZQMDRTRGO *TRIGGER
MOVOBJ - Move dataarea dtaara101 from library DR001 to DR002
20xx/xx/xx 10:06:20 Object deleted (O) - DR001/DTAARA101 *DTAARA
CHGOBJD - Change source physical file QCLPSRC text
ADDPFM - Add source physical file member CLP103 to QCLPSRC
        Insert CLP statements into source CLP103
CRTCLPGM - Create CLP program CLP103
ADDPFM - Add source physical file member FILE101_L2 to QDDSSRC
        Insert DDS statements into source FILE101_L2
CRTLF - Create another logical file FILE101_L2 from DDS on library DR001
20xx/xx/xx 10:06:39 Transfer - DR002/DTAARA101 *DTAARA
20xx/xx/xx 10:06:39 Transfer - DR001/DTAARA102 *DTAARA
20xx/xx/xx 10:06:39 Transfer - DR001/DTAARA103 *DTAARA
        Double records in file FILE101 (total 10 rclds)
20xx/xx/xx 10:06:50 Physical file DR001/QCLPSRC changed
20xx/xx/xx 10:06:51 Delay 19 secs. From 20xxxxxxx/100624 to 100634 (3 rclds)
20xx/xx/xx 10:06:51 Transfer - DR001/QCLPSRC/CLP103
        Double records again in file FILE101 (total 20 rclds)
20xx/xx/xx 10:06:56 Delay 14 secs. From 20xxxxxxx/100634 to 100644 (5 rclds)
20xx/xx/xx 10:06:57 Transfer - DR001/CLP103 *PGM
20xx/xx/xx 10:06:57 Transfer - DR001/QDDSSRC/FILE101_L2
        Double records again in file FILE101 (total 40 rclds)
        Double records again in file FILE101 (total 80 rclds)
20xx/xx/xx 10:07:07 Delay 15 secs. From 20xxxxxxx/100644 to 100654 (5 rclds)
20xx/xx/xx 10:07:09 Transfer - DR001/FILE101_L2 *FILE
        Double records again in file FILE101 (total 160 rclds)
20xx/xx/xx 10:07:17 Delay 15 secs. From 20xxxxxxx/100654 to 100704 (30 rclds)
        Double records again in file FILE101 (total 320 rclds)
20xx/xx/xx 10:07:27 Delay 15 secs. From 20xxxxxxx/100704 to 100714 (40 rclds)
        Double records again in file FILE101 (total 640 rclds)
20xx/xx/xx 10:07:37 Delay 15 secs. From 20xxxxxxx/100714 to 100724 (80 rclds)
        Double records again in file FILE101 (total 1280 rclds)
20xx/xx/xx 10:07:46 Delay 14 secs. From 20xxxxxxx/100724 to 100734 (160 rclds)
20xx/xx/xx 10:07:56 Delay 14 secs. From 20xxxxxxx/100734 to 100744 (320 rclds)
        Double records again in file FILE101 (total 2560 rclds)
20xx/xx/xx 10:08:08 Delay 16 secs. From 20xxxxxxx/100744 to 100754 (640 rclds)
        Double records again in file FILE101 (total 5120 rclds)
        Update file FILE101 set COL02=333,COL03='333' where COL01='3'
20xx/xx/xx 10:08:27 Delay 15 secs. From 20xxxxxxx/100804 to 100814 (1280 rclds)
        Update file FILE101 set COL02=55555,COL03='55555' where COL01='5'
20xx/xx/xx 10:08:48 Delay 16 secs. From 20xxxxxxx/100824 to 100834 (3584 rclds)
20xx/xx/xx 10:08:57 Delay 15 secs. From 20xxxxxxx/100834 to 100844 (1024 rclds)

Done.

You can do more changes on library DR001 or DR002 if you like.
Compare library DR001 and DR002 between source and target AS400
    
```

You can use PDM to review object list in libraries DR001 and DR002.

```

Work with Objects Using PDM

Library . . . . . DR001          Position to . . . . .
                                Position to type . . . . .

Type options, press Enter.
  2=Change      3=Copy      4=Delete      5=Display      7=Rename
  8=Display description  9=Save      10=Restore     11=Move ...

Opt Object      Type      Attribute  Text
CLP103      *PGM      CLP        QMirror/DR test CLP 103
FILE101     *FILE     PF-DTA     Physical file 101
FILE101_LF  *FILE     LF         Logical file for FILE101
FILE101_L2  *FILE     LF         Logical file for FILE101 #2
QCLPSRC     *FILE     PF-SRC     CLP source file
QDDSSRC     *FILE     PF-SRC
DTAARA102  *DTAARA      Text of dtaara102
DTAARA103  *DTAARA      Text of dtaara103
    
```

Bottom

STRSQL, use the following SQL statement to check if data in file DR001/FILE101 is same between source and target AS400s.

SELECT COL01,COUNT(\*),SUM(COL02) FROM DR001/FILE101 GROUP BY COL01 ORDER BY COL01

```

Display Data
Data width . . . . . :
Position to line . . . . . Shift to column . . . . .
.....1.....2.....3.....4.....5.....6.....7
Column 01      COUNT ( * )      SUM ( COL02 )
1              1,024              1,024
2              1,024              2,048
3              1,024              340,992
4              1,024              4,096
5              1,024              56,888,320
***** End of data *****
    
```

To remove simulation test data:

1. End QMirror/DR
2. Use QMirror/DR command option '3' to clear entire library object list
3. Delete library DR001 and DR002 on both source and target AS400s

Go to (400) Back up source AS400 libraries

## (400) Back up source AS400 libraries

To back up full source AS400 libraries, enter 'Y' during instance configuration.

```
Auto-select new libraries from source AS400 to target AS400? (y/N) Y
```

Any new libraries created on source AS400 except library name starts with 'Q' (not include QGPL) or '#' will be replicated to target AS400.

Or, to back up selected libraries only on source AS400, enter 'N' during instance configuration.

```
Auto-select new libraries from source AS400 to target AS400? (y/N) N
```

Then select libraries from source AS400. Any library name starts with 'Q' or '#' is not accepted. QMirror/DR working library is also not accepted.

```
Building library list from source AS400 to target AS400 -  
Enter source AS400 library name (*ALLUSR/generic*/name): libr_a  
Replicate from source library LIBR_A (y/N/q) Y
```

Object type as \*JRN, and \*JRNRCV will not be replicated.

The system security data will be saved as a save file QZQMDRSEC \*SAVF in QMirror working library once a day.

When do recovery, the system security data can be restored manually if needed. Information saved by the command SAVSECDTA can be restored using the Restore User Profiles (RSTUSRPRF) and Restore Authority (RSTAUT) commands.

The triggers of the physical files will be disabled on target AS400. The triggers list is kept on object QZQMDRTRG0 \*FILE and saved in a save file QZQMDRTRG \*SAVF in target AS400 QMirror working library.

Go to [\(410\) Exclude objects from QMirror/DR object list](#)

## **(410) Exclude objects from QMirror/DR object list**

If you want to exclude specified objects from QMirror/DR object list, you can change download flag TBDWFG to 'X' in system table QMIRROR.ZAMTBF.

E.g. UPDATE QMIRROR.ZAMTBF  
SET TBDWFG='X'  
WHERE TBLIB='LIBR1' AND TBOBJ='FILEA' AND TBMBR='FILEA'

QMirror/DR will end object journaling from source AS400 and drop the objects from target AS400 which TBDWFG is 'X'.

Go to [\(220\) About QMirror/DR internal SQLite database](#)

Go to [\(420\) Normal running QMirror/DR](#)

## (420) Normal running QMirror/DR

To execute QMirror/DR on a new shell, take command option 1 - 'Start QMirror/DR'.

```

QMirror/DR x.x.x (released at 20xx/xx) command list (QMDR):
1 - Start QMirror/DR
4 - Build up object list from source AS400 libraries
6 - Show select library list
7 - Show excluded object list
8 - ENDJRNPF unselected libraries
K - Change license key
R - Switch to recovery mode
T - Simulation test
U - Uninstall QMirror/DR
Q - Quit
Your option is (1/4/5/6/7/8/k/r/t/u/Q) 1
    
```

Now QMirror/DR is starting to download and replicate from the source AS400 to the target AS400.

Go to [\(430\) End QMirror/DR](#)

## (430) End QMirror/DR

Execute QMirror/DR in a new shell and take command option 2 - 'End current instance'.

```
QMirror/DR x.x.x (released at 20xx/xx) command list (QMDR):  
0 - Reboot QMirror/DR if running  
1 - Start QMirror/DR  
2 - End QMirror/DR  
L - Log monitoring  
S - Status monitoring  
Q - Quit  
Your option is (0/1/2/D/L/S/q) 2
```

Or, you can use Ctrl-C to terminate QMirror/DR immediately.

Go to [\(440\) Get QMirror/DR running log and status](#)

## **(440) Get QMirror/DR running log and status**

QMirror/DR current status is kept in the system table QMIRROR.ZJBSTS. Please refer to [\(A50\) Job log file \(ZJBLOG\) / Job status file \(ZJBSTS\)](#) for table structure and field comments.

The administrator may monitor QMirror/DR running log and status on any PC at any place as following.

Execute QMirror/DR in a new shell. Take command option L - 'Log Monitoring'.

Execute QMirror/DR in a new shell. Take command option S - 'Status Monitoring'.

The monitoring displays will be refreshed every ten seconds. For security consideration, the only way to stop monitoring display is using Ctrl-C.

Go to [\(450\) Add more libraries from source AS400](#)

## **(450) Add more libraries from source AS400**

1. Execute QMirror/DR in a new shell
2. End QMirror/DR if running (command option 2)
3. Add more source AS400 libraries into QMirror/DR (command option 4)  
(to start journaling for physical files)
4. **Save libraries from source AS400 and restore to target AS400 by tape**  
**(saving time to transfer large objects by FTP)**
5. Start QMirror/DR (command option 1)

Go to [\(460\) Learn QMirror/DR object transfer status](#)

## (460) Learn QMirror/DR object transfer status

Object status is kept in field TBDWFG, QMIRROR.ZAMTBF.

- 'A' - Wait to transfer
- 'G' - Transferring
- 'R' - Transferred, ready to replicate
- 'X' - Excluded from QMirror/DR
- 'Z' - Transferred and replicating

For examples:

1. To know which object is not ready

```
SELECT * FROM QMIRROR.ZAMTBF
WHERE TBDWFG<>'Z' AND TBDWFG<>'X'
```

2. To know which tables are excluded from QMirror/DR

```
SELECT * FROM QMIRROR.ZAMTBF WHERE TBDWFG='X'
```

Go to [\(220\) About QMirror/DR internal SQLite database](#)

Go to [\(470\) Recovery Mode](#)

## **(470) Recovery mode**

Take command option 'R' to switch to recovery mode. Then restart QMirror/DR and take command option '9' to start recovery.

When do recovery, the triggers will be enabled again on the target AS400.

The system security data can be restored manually if needed. Information saved by the command SAVSECDTA can be restored using the Restore User Profiles (RSTUSRPRF) and Restore Authority (RSTAUT) commands.

Go to (500) Prepare batch programs to execute QMirror/DR

## **(500) Prepare batch programs to execute QMirror/DR**

A faster way to execute QMirror/DR is to use batch programs.

A batch program named 'run\_qmirror\_qmdr.bat' was created in the QMirror/DR directory. Follow the instruction in 'run\_qmirror\_qmdr.bat' to preset all the parameters needed by QMirror/DR. You can get all the encrypted data from QMirror/DR console displayed under the interactive mode.

(Notes: QMirror/DR keeps the last workable run\_qmirror\_qmdr.bat into run\_qmirror\_qmdr.bat.ba2 automatically, so there is no need to re-edit run\_qmirror\_qmdr.bat again when you upgrade QMirror/DR to a newer version.)

Go to [\(510\) Install QMirror/DR as a Windows service](#)

## **(510) Install QMirror/DR as a Windows service**

Notice:

1. QMirror/DR must be installed before QMirror/DR service.
2. QMirror/DR service must be installed on the same PC server which has QMirror/DR installed.

To install QMirror/DR as a Windows service:

1. Download QMirror\_DR\_120s.zip from <http://www.qmirror.com>
2. Uninstall the earlier QMirror/DR service from the Windows program menu list
3. Unzip, execute QMirror\_DR\_120s.exe, and follow the instructions
4. A program menu 'QMirror DR Service' will be created on Windows
5. Edit the preset parameters as needed in c:\QMirrorDRService\QMDR.ini  
(Notes: QMirror/DR service keeps the last workable QMDR.ini into QMDR.ini.ba2 automatically, so there is no need to re-edit QMDR.ini again when you upgrade QMirror/DR service to a newer version.)
6. Start QMirror/DR service by launching 'Services' from the Windows 'Control Panel / Administrative Tools'

Refer to [\(440\) Get QMirror/DR running log and status](#)

Go to [\(520\) Uninstall QMirror/DR](#)

## (520) Uninstall QMirror/DR

Take command option 'U' to clear and delete working library on source and target AS400s.

```

QMirror/DR x.x.x (released in 20xx/xxlist (QMDR):
 1 - Start QMirror/DR
 3 - Remove libraries from library list
 4 - Build up object list from source AS400 libraries
 6 - Show selected library list
 7 - Show excluded object list
 8 - ENDJRNPF unselected libraries
 K - Change license key
 R - Switch to recovery mode
 U - Uninstall QMirror/DR
 Q - Quit
Your option is (1/3/4/5/6/7/8/k/r/u/Q) u

Clear and delete QMirror working library on AS400s? (y/N) y

20xx/xx/xx 10:20:18 Clear remote journals on target AS400 ...
20xx/xx/xx 10:20:21 Remote journal QMIRROR/JRN deleted
20xx/xx/xx 10:20:22 Remote journal receiver QMIRROR/JRCV0001 deleted
20xx/xx/xx 10:20:22 Delete QMirror working library QMIRROR on target AS400
20xx/xx/xx 10:20:24 End journal physical files from journal QMIRROR/JRN
20xx/xx/xx 10:20:24 This may take minutes ...
20xx/xx/xx 10:20:25 Completed ending physical files journaling from journal QMIRROR/JRN
20xx/xx/xx 10:20:25 Journal QMIRROR/JRN deleted
20xx/xx/xx 10:20:25 Journal receiver QMIRROR/JRCV0001 deleted
20xx/xx/xx 10:20:25 Delete QMirror working library QMIRROR on Source AS400
20xx/xx/xx 10:20:28 QMirror/DR is uninstalled
    
```

Then select 'Uninstall QMirror/DR' from Windows program menu list or execute  
c:\QMirrorDR\uninstall.exe

## **(A00) Library master (ZALIBR)**

<b>Field name</b>	<b>Key</b>	<b>Data type</b>	<b>Description</b>
=====	===	=====	=====
LIBRFM	K	CHAR(10)	Source library name
LIBRTO		CHAR(10)	Target library name
LIBRST		CHAR(1)	Status 'X' – Excluded from QMirror/DR
LIBRAJ		CHAR(1)	Auto-journaling
LIBRTX		CHAR(50)	Text
LIBFRDT		NUMBER(8,0)	Last save date
LIBFRTM		NUMBER(6,0)	Last save time

Go to [\(220\) About QMirror/DR internal SQLite database](#)

**(A10) AS400 object master (ZAMTBF)**

Field name	Key	Data type	Description
=====	===	=====	=====
TBLIB	K	CHAR(10)	AS400 library name
TBOBJ	K	CHAR(10)	Object name
TBMBR	K	CHAR(10)	Member name
OBJTP		CHAR(8)	Object type
OBJAT		CHAR(10)	Object attribute
TBREPL		CHAR(1)	To be replicated
TBJLIB		CHAR(10)	Journal library
TBJNAM		CHAR(10)	Journal name
TBTXT		CHAR(50)	Text
TBDWFG		CHAR(1)	Object status Refer to <a href="#">(460) Learn QMirror/DR transfer status</a>
TBPRTY		NUMBER(2,0)	Transfer priority
TBSTS		CHAR(1)	Object status 'E' - Error occurred for this object
OBSIZE		NUMBER(15,0)	Object size

Go to [\(220\) About QMirror/DR internal SQLite database](#)

**(A50) Job log file (ZJBLOG) / Job status file (ZJBSTS)**

Field name	Key	Data type	Description
=====	===	=====	=====
ZJTYPE		CHAR(1)	Log type blank - Delay status 'D' - Replicate status 'E' - Error occurred 'R' - Recovery status
ZJJBID		NUMBER(3,0)	Job ID
ZJRPDT		NUMBER(8,0)	Reporting date
ZJRPTM		NUMBER(6,0)	Reporting time
ZJACTN		CHAR(30)	Action description
ZJLIB		CHAR(10)	AS400 library name
ZJOBJ		CHAR(10)	AS400 file name
ZJMBR		CHAR(10)	AS400 member name
ZJDATE		NUMBER(8,0)	Journal date
ZJTIME		NUMBER(6,0)	Journal time
ZJRCDS		NUMBER(10,0)	Journal records
ZJBSTS		CHAR(1)	Status code blank - Normal delay 'S' - Starting delay
ZJRMRK		CHAR(128)	Remark

Refer to [\(220\) About QMirror/DR internal SQLite database](#)

Refer to [\(440\) Get QMirror/DR running log and status](#)

**(A60) Journal master (ZJMASF)**

<b>Field name</b>	<b>Key</b>	<b>Data type</b>	<b>Description</b>
=====	===	=====	=====
ZMJLIB	K	CHAR(10)	Journal library
ZMJNAM	K	CHAR(10)	Journal name
ZMJNDX		NUMBER(3,0)	Journal index
ZMCRCV		CHAR(10)	Current journal receiver
ZMCSEQ		NUMBER(10,0)	Current sequence number
ZMJRCV		NUMBER(4,0)	No. of last deleted journal receiver
ZMRMRK		CHAR(128)	Remark

Go to [\(220\) About QMirror/DR internal SQLite database](#)

**(A70) System log file (ZPCLOG / ZPCLOG2)**

<b>Field name</b>	<b>Key</b>	<b>Data type</b>	<b>Description</b>
=====	===	=====	=====
ZPLGDT		NUMBER(8,0)	Logging date
ZPLGTM		NUMBER(6,0)	Logging time
ZPLSEQ		NUMBER(3,0)	Sequence number
ZPLOGS		TEXT	QMirror/DR log

Go to [\(220\) About QMirror/DR internal SQLite database](#)

**(A80) System control file (ZSERVR)**

<b>Field name</b>	<b>Key</b>	<b>Data type</b>	<b>Description</b>
=====	===	=====	=====
ZVERNO		CHAR(10)	QMirror/DR version number
ZSVRID		CHAR(4)	Configuration ID
ZRECOVERY		CHAR(1)	'Y' - recovery mode
ZSYSDB		CHAR(1)	Separated system database
ZPTPIP		CHAR(30)	Target AS400 IP address
ZPUSER		CHAR(30)	Target AS400 user ID
ZATPIP		CHAR(30)	Source AS400 IP address
ZAUSER		CHAR(10)	Source AS400 user ID
ZSLKEY		CHAR(31)	QMirror/DR license key
ZACHAR		CHAR(10)	Character set
ZCCSID		CHAR(5)	DBCS/Unicode default CCSID
ZAJBPR		NUMBER(2,0)	AS400 job priority
ZXDLJB		NUMBER(2,0)	Maximum transfer threads
ZMSIZE		NUMBER(5,0)	Optimum mirror block size
ZJBLOG		CHAR(10)	Log flags
ZMLMSG		CHAR(1)	Email option 'N' - None 'E' - Error messages 'W' - Error and warning messages
ZMHOST		CHAR(64)	Email SMTP host
ZMADDR		CHAR(128)	Email address
ZMRDLN		NUMBER(5,0)	Maximum record length
ZJMRDT		NUMBER(8,0)	Replication cutoff date
ZJMRTM		NUMBER(6,0)	Replication cutoff time
ZDESC		CHAR(50)	Configuration description

Go to [\(220\) About QMirror/DR internal SQLite database](#)

## **(B10) Error messages**

- E001: AS400 user <user> does not have the authority to execute QMirror/DR
- E002: Object list is empty. Please build up object list from AS400 libraries
- E004: Make sure the latest PTFs are applied to the AS400 server at <IP address>
- E101: QMirror/DR license is expired or incorrect
- E103: Configuration failure
- E106: Configuration ID <id> is incorrect
- E201: System control record in system table <database.table> is missed
- E203: QMirror/DR already started
- E204: Failed to start QMirror/DR
- E205: Target AS400 at <IP address> does not exist
- E301: AS400 at <IP address> is not running
- E302: AS400 user password is incorrect
- E303: AS400 connection failure
- E304: <journal work file> cannot be created or has been locked
- E305: Mirror threads could not be started
- E306: Journal reading failure

## **(B20) Warning messages**

- W101: QMirror/DR configuration terminated
- W103: QMirror/DR license will be expired at the end of this month
- W104: QMirror/DR command terminated
- W303: AS400 at <IP address> is not running. Will re-connect <n> minutes later.
- W305: Failed to build up the replication path. Re-starting QMirror/DR.
- W307: AS400 journal <library/journal> is not available now. Will try again later.
- W308: AS400 journal <library/journal> does not exist or read error
- W310: Replication error - <library/file/member/rrn>
- W311: CHGPF <library/file> on target AS400 failure
- W312: CHGPFM <library/file/member> on target AS400 failure
- W401: Check connections between source and target AS400
- W402: AS400 at <IP address> is not running.  
         Will re-connect <n> minutes later.