

Unit 16. Backup and restore of WebSphere MQ object definitions

What this unit is about

This unit covers the ways in which a queue manager can be backed up and restored using the file system where it is installed. Also covered is the use of the MS03 SupportPac to unload queue manager object definitions.

What you should be able to do

After completing this unit, you should be able to:

- Plan a methodology to regularly back up the WebSphere MQ environment
- Describe how to use the MS03 SupportPac to capture queue manager object definitions

How you will check your progress

- Checkpoint Quiz
- Lab exercise to follow

References

WebSphere MQ V7 Information Center

MS03 SupportPac documentation

Unit objectives

After completing this unit, you should be able to:

- Plan a methodology to regularly back up the WebSphere MQ environment
- Describe how to use the MS03 SupportPac to capture queue manager object definitions

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Figure 16-1. Unit objectives

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Notes:

16.1.File system backup and restore

File system backup and restore topic objectives

After completing this topic, you should be able to:

- Explain the need for full backups of the WebSphere MQ file systems
- Perform backups of the WebSphere MQ file system correctly

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Figure 16-2. File system backup and restore topic objectives

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Notes:

Overview of the WebSphere MQ file system structure

- Windows:
 - Default: c:\Program Files\IBM\WebSphere MQ\
 - Or for 64-bit: c:\Program Files\IBM\WebSphere MQ (x86)\
- AIX
 - Programs: /usr/mqm
 - Data: /var/mqm
- Solaris
 - Programs: /opt/mqm
 - Data: /var/mqm
- High availability variations

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Figure 16-3. Overview of the WebSphere MQ file system structure

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Notes:

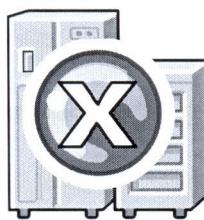
There are some variations in the file system layout for WebSphere MQ depending on the platform. WebSphere MQ V7 is now 64 bit so there is now a new name for the base directory to differentiate it from the 32 bit version on the Windows platform.

Data is embedded in the Windows file structure.

For AIX and Solaris, the differentiation between programs and data is more obvious.

The need to backup

- Allow recovery of queue managers against possible corruption or loss of data caused by hardware failures
- WebSphere MQ file system backup can be done as part of a full system backup



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Figure 16-4. The need to backup

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Notes:

When to backup

- File system backups can be done as part of the regular full system backup.
- Backups may be run at any time interval
 - Nightly
 - Weekly
- Backups should be run regularly
- Backups must be conducted when WebSphere MQ is not running

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Figure 16-5. When to backup

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Notes:

An important note is that WebSphere MQ must not be running at the time of backing up as the backup is not consistent because of updates in progress when the files were copied.

How to backup

- Ensure queue manager is not running
- Locate directories where the queue manager places its data and log files
- Take copies of all the data from the queue manager and log file directories, including subdirectories
- Restart the queue manager

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Figure 16-6. How to backup

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Notes:

As previously mentioned, an important note is that the queue manager must not be running when doing a backup.

File system backup and restore topic summary

Having completed this topic, you should be able to:

- Explain the need for full backups of the WebSphere MQ file systems
- Perform backups of the WebSphere MQ file system correctly

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Figure 16-7. File system backup and restore topic summary

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Notes:

16.2.Object definition backup and restore

Overview

Notes

Object definition backup and restore topic objectives

After completing this topic, you should be able to:

- Discuss the requirements for backup and restore of WebSphere MQ object definitions
- Explain facilities available for backup of definitions

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Figure 16-8. Object definition backup and restore topic objectives

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Notes:

Overview of WebSphere MQ objects

- WebSphere MQ object types include:
 - Queue managers
 - Queues
 - Channels
 - Process definitions
 - Listeners
 - Namelists
 - Client connection channels
 - Services
 - Authentication information objects
- Anything you define to WebSphere MQ using MQSC

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Figure 16-9. Overview of WebSphere MQ objects

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Why back up WebSphere MQ object definitions

- The output generated from a backup of object definitions can be used to simplify several tasks in WebSphere MQ including:
 - Migration
 - Cloning systems
 - Automation of application migrations
 - Auditing

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Figure 16-10. Why back up WebSphere MQ object definitions

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Notes:

When migrating applications you would most likely want to keep the same object definitions from the queue managers of source environment. By backing up the WebSphere MQ object definitions you can later restore them on the new queue manager quickly and easily. Otherwise, to restore the queue managers as they were in the old version it would need to be done manually. Similarly when cloning systems (typically for clustering) or for automation of application migrations, it provides a quick and simple way to copy the object definitions from one queue manager to another. If you are doing an audit on your WebSphere MQ system, backing up the object definition, provides a way of looking at all the definitions in one place. Fundamentally, backing up object definitions is about saving time and effort by using the backup file to re-create the object definition on a new queue manager.

Overview of facilities available

- Output from display command in runmqsc
- SupportPac MS03 (saveqmgr)
 - Save Queue Manager object definitions using PCFs

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Figure 16-11. Overview of facilities available

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Notes:

Backing up resource definitions with runmqsc

- runmqsc <qmgr_name>
display ql(*) all
display qr(*) all
display chl(*) chltype(*) all
and so forth
- Simple and quick method to see all the object definitions
- runmqsc now comes equipped with an SQL like syntax so that queries can be easily refined
- Output is formatted in single or multi column format,
 - Needs reformatting to be used for restore purposes

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Figure 16-12. Backing up resource definitions with runmqsc

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Notes:

To use the runmqsc display output, once inside runmqsc run *display ql(*) all*. This outputs the resource definitions for a given queue manager. This output is useful for a quick overview of the object definitions, however its format in single or multi-columns, makes it difficult to be used for restore purposes. Reformatting would be needed to use the output for restore purposes.

MS03 Save queue manager object definitions

- SupportPac which interrogates the attributes of all the objects defined to a queue manager (either local or remote) and saves them to a file
 - Suitable for use with `RUNMQSC`
 - Can be used with any of the WebSphere MQ family that supports PCFs
- This file can subsequently be used to re-create the object definitions for a new queue manager
`runmqsc qmgr_name < saveqmgr_output`
- Usage
`saveqmgr [options]`
- Can be downloaded from the SupportPac Web site

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Figure 16-13. MS03 Save queue manager object definitions

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Notes:

MS03 is a command-line program and can be invoked with a `-?` flag to display which parameters it will accept. Common options for `saveqmgr` include:

- `-v` version: Determines which version of MQSC to generate (The default is to generate mqsc at the version of the connected queue manager)
- `-m lqmgr`: The name of the local queue manager to connect (MQCONN)
- `-r rwmgr`: The name of the remote queue manager (XMITQ name)
- `-f [file]`: Allows the output file to be named,
 - if `-f` is not specified, the output file defaults to `SAVEQMGR.TST`
 - if `-f` is specified without a file name, it is named "`qmgrname".MQS`.
- `-z [file]`: Create 'security definitions (like amqoam -s)' in file 'file'(this is only from V6 onwards)

If not specified, it defaults to "`qmgrname".AUT`.

MS03 Saveqmgr example

```
C:\MS03_Win>saveqmgr -m AJGMQ1 -f
SAVEQMGR V6.0.3
Compiled for Websphere MQ V6.0 on Aug 22 2006
Requesting attributes of the queue manager...
Writing Queue Manager definition to AJGMQ1.MQS.
Generating attributes for Websphere MQ Release 6.0.0
Generating code for platform WINDOWSNT
Requesting attributes of all authinfo objects...
Requesting attributes of all queues...
Requesting attributes of all channels...
Requesting attributes of all processes...
Requesting attributes of all namelists...
Requesting attributes of all listeners...
Requesting attributes of all services...
Writing AuthInfo definitions to AJGMQ1.MQS.
Writing Queue definitions to AJGMQ1.MQS.
Skipping dynamic queue AMQ.MQEXPLORE.889074942
Skipping dynamic queue SAVEQMGR.48707EBC02B41720
Writing Channel definitions to AJGMQ1.MQS.
Writing Process definitions to AJGMQ1.MQS.
Writing Namelist definitions to AJGMQ1.MQS.
Writing Listener definitions to AJGMQ1.MQS.
Writing Service definitions to AJGMQ1.MQS.
C:\MS03_Win>
```

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Figure 16-14. MS03 Saveqmgr example

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Notes:

Object definition backup and restore topic summary

Having completed this topic, you should be able to:

- Discuss the requirements for backup and restore of WebSphere MQ object definitions
- Explain facilities available for backup of definitions

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Figure 16-15. Object definition backup and restore topic summary

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Notes:

16.3. Security definition backup and restore

Security definition backup and restore topic objectives

After completing this topic, you should be able to:

- Discuss the need for security definition backup and restore
- Discuss the facilities available for backup and restore of WebSphere MQ security definitions

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Figure 16-16. Security definition backup and restore topic objectives

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Notes:

Overview of security definitions

- When discussing security definitions, in this context it refers to:
 - WebSphere MQ OAM security definitions
 - Not UNIX or Windows security profiles
 - Not SSL data
- OAM security definitions
 - Define the authorizations given to a specified user group
 - Created using `setmqaut`

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Figure 16-17. Overview of security definitions

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Notes:

The following notes are available:
- Overview of security definitions
- Authorizing users and groups
- Defining security profiles
- Defining security objects
- Defining security rules

Need to back up security definitions

- Migration between environments
- Audit purposes

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Figure 16-18. Need to back up security definitions

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Notes:

Similarly to backing up object definitions, backing up security definitions, allows users to save time and effort by using the backup file to re-create the security definitions, rather than doing it manually. With regards to audits, again it provides a way to view the security definition information in one place and in a format that might be more meaningful to the viewer.

How to back up security definitions (1 of 2)

Options:

1. dmpmqaut for a report format output
2. amqoamd -s for setmqaut format output
 - Undocumented utility, but widely known
 - Supported
3. MS03 saveqmgr -z also dumps security definitions (since V6)

```
setmqaut -m AJGMQ1 -n @CLASS -t channel -p andrew@IBM-L3M1562 +crt
setmqaut -m AJGMQ1 -n @CLASS -t channel -g mqm +crt
setmqaut -m AJGMQ1 -n @CLASS -t authinfo -p andrew@IBM-L3M1562 +crt
setmqaut -m AJGMQ1 -n @CLASS -t authinfo -g mqm +crt
setmqaut -m AJGMQ1 -n SYSTEM.BROKER.ADMIN.STREAM -t queue -p
  MUSR_MQADMIN@IBM-L3M1562 +browse +chg +clr +dlt +dsp +get +inq +put
  +passall +passid +set +setall +setid
setmqaut -m AJGMQ1 -n SYSTEM.BROKER.ADMIN.STREAM -t queue -g mqm +browse
  +chg +clr +dlt +dsp +get +inq +put +passall +passid +set +setall +setid
setmqaut -m AJGMQ1 -n @CLASS -t topic -p MUSR_MQADMIN@IBM-L3M1562 +none
setmqaut -m AJGMQ1 -n @CLASS -t topic -g mqm +crt
setmqaut -m AJGMQ1 -n @CLASS -t topic -g Users +none
setmqaut -m AJGMQ1 -n ACTIV.REPLY.Q -t queue -p andrew@IBM-L3M1562 +browse
  +chg +clr +dlt +dsp +get +inq +put +passall +passid +set +setall +setid
  :
```

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Figure 16-19. How to back up security definitions (1 of 2)

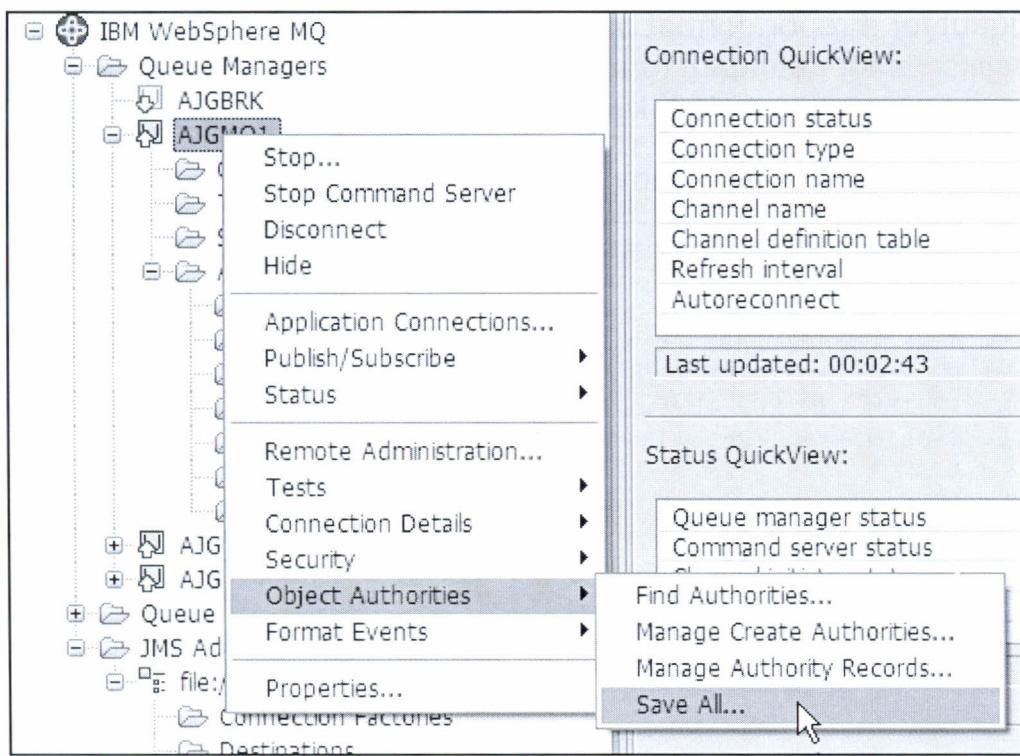
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Notes:

The example shows output from running *amqoamd -s*. Unlike the object definition output from MS03, this output cannot be used with *runmqsc*. These *setmqaut* commands can be run directly to the command line to re-create the security definitions.

How to back up security definitions (2 of 2)

- Authorities can also be dumped from WebSphere MQ Explorer:



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Figure 16-20. How to back up security definitions (2 of 2)

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Notes:

Security definition backup and restore topic summary

Having completed this topic, you should be able to:

- Discuss the need for security definition backup and restore
- Discuss the facilities available for backup and restore of WebSphere MQ security definitions

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Figure 16-21. Security definition backup and restore topic summary

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Notes:

Checkpoint questions

1. Should you run a backup while WebSphere MQ is running? If not, why?
2. There are two methods to back up resource and object definitions. Backing up resource definitions with runmqsc and using the MS03 SupportPac to save queue manager object definitions. What is the main difference between the two?
3. If you want to re-create your security definitions what would be the best method to back them up?
 - a. dmpmqaut
 - b. amqoamd -s

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Figure 16-22. Checkpoint questions

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Notes:

Unit summary

Having completed this unit, you should be able to:

- Plan a methodology to regularly back up the WebSphere MQ environment
- Describe how to use the MS03 SupportPac to capture queue manager object definitions

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Figure 16-23. Unit summary

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Notes: