Software Services for WebSphere

WebSphere MQ Multi-Instance Queue Managers





Capitalware's MQ Technical Conference v2.0.1.3

WebSphere MQ Best Practices

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Experience

✤ Wall St Consultant 25+ years (z, CICS, DB2) (MQ, MQSI)

- MQ/MQSI/WMB since 1998
- ✤ IBM ISSW 8 years
 - Healthchecks
 - Crit Sits
 - Architecture, programming, etc
- Tech Lead for ISSW for MQ and MQFTE (MFT) Also for MQAMS/ WMB
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WebSphere MQ Industry Practices Credits

- Talk to your IBM representative
- Talk to your collegues
- Visit The Capitalware site



http://www.capitalware.biz/

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WebSphere MQ Multi-Instance QMGRS Overview

- Basic failover support
- Not intended to replace HA coordinators
- Data retained on network storage
- Queue manager can be started on different machines
 - Active instance
 - Standby instance

Basic Multi-Instance Operation



Network Storage

Basic Multi-Instance Operation



Network Storage

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Basic Multi-Instance Operation



Supported WebSphere MQ platforms

- Currently available at 7.0.1.0 for the following:
 - AIX
 - Linux® (Power, X86-32, X86-64, System z)
 - HP (both HP-UX Itanium and PA-RISC)
 - Windows®
 - Solaris
- Not available for z/OS

Considerations

- Not intended to manage resources beyond MQ
- System IP address not assumed as part of failover
- Support for networked storage over modern network file system protocols
 - NFS V4 or a compliant POSX file system
 - Windows CIFS (Common Internet File System)
 - Must ensure that any caching is turned OFF to ensure data integrity

New Commands

- Network storage validation command
 - amqmfsck (UNIX® only)

- Commands to modify mqs.ini
 - addmqinf
 - dspmqinf
 - rmvmqinf

Updated Commands

- crtmqm
 - md message data
 - Id transaction log data
 - sax create the queue manager start the queue manager set the queue manager to autostart start it with the 'x' flag (Windows)

strmqm

- x starting of multi instance queue manager
- f rebuild queue manager objects

Updated Commands (continued)

- endmqm
 - x stop the standby instance
 - s switch to failover instance
 - r Start trying to reconnect reconnectable clients

Updated Commands (continued)

- amqmdain (Windows)
 - alter /x <set | unset> modify the start type of a multi-instance queue manager
 - end /s /r /x same as endmqm
 - Registry operation is restricted for multi-instance queue managers.

Updated Commands (continued)

- dspmq
 - n display output in English
 - o standby display standby state
 - x display instance information
- Updates to runmqsc
 DISPLAY QMSTATUS ALL

WebSphere MQ Multi-Instance QMGRS UNIX walkthrough

- Ensure that matching user and group ids for mqm exist on both systems
- Test the network storage using amqmfsck
 - amqmfsck /shared/qmdata
 - Checks basic POSIX file locking behaviour
 - amqmfsck -w /shared/qmdata
 - Use on two machines at once to ensure that the locks are handed off correctly when a process ends.
 - amqmfsck -c /shared/qmdata
 - Use on two machines at once to attempt concurrent writes.

UNIX walkthrough(continued)

Create the queue manager on machine A

crtmqm -md /shared/qmdata -ld /shared/qmlog QM1

Extract the QMGR information

dspmqinf -O Command QM1

• Define the queue manager on machine B (or edit mqs.ini)

addmqinf -v Name=QM2 -v Directory=QM1 -v Prefix=/var/mqm -v DataPath=/shared/qmdata/QM1

note that the above can be carried out on additional systems

UNIX walkthrough(continued)

Start the active instance of the queue manager on machine A

strmqm -x QM1 WebSphere MQ queue manager 'QM1' started.

• Start the standby instance of the queue manager on machine B

strmqm -x QM1
WebSphere MQ queue manager 'QM1' started as a
 standby instance.

Only one active and one standby instance operational at a time

Observing a multi-instance queue manager

• On machine A:

```
dspmq -x -o standby -o status
  QMNAME(QM1) STANDBY(Permitted) STATUS(Running)
   INSTANCE(machineA) MODE(Active)
   INSTANCE(machineB) MODE(Standby)
```

• On machine B:

```
dspmq -x -o standby -o status
QMNAME(QM1) STANDBY(Permitted) STATUS(Running as
standby)
INSTANCE(machineA) MODE(Active)
INSTANCE(machineB) MODE(Standby)
```

 If defined on an additional system (machine C, D, etc...): dspmq -x -o standby -o status QMNAME(QM1) STANDBY(Permitted) STATUS(Running elsewhere) INSTANCE(machineA) MODE(Active) INSTANCE(machineB) MODE(Standby)

•Queue manager status enhanced to show whether standby instances are permitted

DISPLAY QMSTATUS ALL 1 : DISPLAY QMSTATUS ALL

AMQ8705: Display Queue Manager Status Details. QMNAME(QM1) STATUS(RUNNING) CONNS(27) CMDSERV(RUNNING) CHINIT(RUNNING) STANDBY(PERMIT)

Windows mqm Group

- Members of the local mqm group of the primary (creating) node will have access
- Unlike UNIX systems, local groups on different nodes can not be made to match
- Modifying file permissions at failover is too costly Different from MSCS
- Answer create a mini-domain

Defining Network Shares

- Defining Network Shares
- Universal Naming Convention (UNC) share names should be used to avoid session boundaries
- Queue Manager log path cannot be the same as the data path
- Read/Write access must be granted for :
 - SYSTEM ID
 - mqm Group
 - Administrators Group

Configuration Data

- Queue manager configuration data can either be in the Windows registry or in INI files
- crtmqm /md flag indicates that the queue managers data is not in the default location (registry)
- DataPath attribute used to control location of queue manager configuration data - Windows registry or INI files
- Standard crtmqm will continue to use the Windows registry

Configuration Data (continued)

			WebSphere MQ Release		
Queue Managers	V7.0		V7.0.1		
Conngulation		Star	ndard	Multi-Instance	
mqs.ini Registry		Reg	gistry	Registry	
qm.ini	Registry	Reg	gistry	INI File	
qmstatus.ini	Registry	Registry		INI File	
E C Se Wainte	QM_INI QM_REG ExitPath InstanceData Log Service ServiceComponent rvices ace ebAdministration	Name (Default) (Defa	Type REG_SZ REG_SZ REG_SZ REG_SZ REG_SZ	Data (value not set) \\Shannara\MQSeries\qmgrs\QM_INI QM_INI QM_INI D:\MQSeries	

WebSphere MQ Multi-Instance QMGRS Windows Walkthrough

- Configure a pair of Windows servers as domain controllers
- The WMQ service needs to run as a domain user who is a member of the mqm group



Windows Walkthrough (continued)

- Create a shared directory for the queue manager data
- The network share must be within the domain
- Modify both the share and file permissions
- Create the queue manager using the appropriate flags, specifying the data and log path. Use UNC format for network locations

Windows Walkthrough (continued)

Active Queue Manager Node	Standby Queue Manager Node
crtmqm/md \\host\share\data /ld \\host\share\log QM1	
	addmqinf /s QueueManager /v Name=QM1 /v Directory=QM1 /v Prefix="c:\mqm" /v DataPath=\\host\share\data
strmqm /x QM1	
	strmqm /x QM1

MQ Explorer



only 1 new icon

Create Queue Manager wizard (continued)

- Default data and log paths can be changed (previously just log path)
- Checks for valid directory
- Checks for same path name

ueue Manager				
Enter data and log '	values			
ueue manager name:	QMI			
	Ol lice circular logging			
	Ouse linear logging			
Log file size: (x4KB)	4096	A V		
Log primary files:	3	A Y		
Log secondary files:	s: 2			
Data and Log paths -				
Data and Log paths Use default paths Data path: C:\Progra Log path: C:\Progra	am Files(IBM(WebSphere MQ)(gingrs Browse, am Files(IBM(WebSphere MQ)(og Browce,			
Data and Log paths	am Files\IBM\WebSphere MQ\qingis Browse. am Files\IBM\WebSphere MQ\log Browse.			
Data and Log paths Use default paths Data path: C:IProgra Log path: C:IProgra	an Files\IBM\WebSphere MQ\qmgrs Browse, an Files\IBM\WebSphere MQ\log Browse,			
Data and Log paths	em Files\IBM\WebSphere MQ\qmgrs Browse.			
Data and Log paths	am Files(IBM(WebSphere MQ)qmgrs Browse, am Files(IBM(WebSphere MQ)log Browce,			
Data and Log paths Use default paths Data path: C:\Progra Log path: C:\Progra	an Files\IBM\WebSphere MQ\qmgrs Browse. an Files\IBM\WebSphere MQ\log Browse.			

Create Queue Manager wizard (continued)

- Queue manager can be started to permit failover
- Automatic and Permit standby will use "–sax" option

🕀 Create Queue Manager	_ 🗆 🖂
Queue Manager	
Enter configuration options	
Direre manager name: 0M1	
Consumate Lance Arra	
Start queue manager after it has been created	
Multi-instance Queue Manager:	
Permit a standby instance	
Select hung of queue manager startun	
Service (manual)	
O Interactive (manual)	
Configures the gueue manager to start automatically when the machine starts up.	
%L	
Create server connection channel to allow remote administration of the queue	
manager over TCP/IP	
Create server-connection channel	
	Canaal
	Cancel

Add Remote Queue Manager wizard

- Connect to single or multi instance queue manager using "Connect directly"
- Using a Client Channel Definition Table (CCDT) used to be on second page



Add Remote Queue Manager wizard (continued)

- CCDT details moved to own page
- Use for single or multi instance
- Multi instance
 - same channel name used for each instance
 - auto-reconnect enabled (can be reset)
 - further instances can be added using the Manage Instances dialog

🕑 Add Queue Manager			
Specify new connection	details		
Provide details of the con	iection you want to set up		
÷			
Queue manager name:	HB		
Connection details			
Host name or IP address:			
Port number:	1414		
Server-connection channel:	SYSTEM.ADMIN.SVRCONN		
Port number:	1414		
Port number:	1414		
Server-connection channel:	: SYSTEM.ADMIN.SVRCONN		
Autoreconnect			
Automatically refresh inform	ation shown for this queue manager		
Refresh interval (seconds):	300		
0	< Back Next > Finish	Cancel	
2.77			

Queue Manager content page

MQ Explorer - Eclipse SDK		
Eile Edit Navigate Search Project Debug Ru	un <u>W</u> indow <u>H</u> elp	
📬 • 🖃 🖾 🕨 🔳 💁 • 🛷	$\Phi = \Phi + \Phi + \Phi + \Phi + \Phi$	MQ Explorer
😪 MQ Explorer - Navigator 🛛 🖓 🖓	MQ Explorer - Content	백 🤣 🏱 🗖 🕻
 IBM WebSphere MQ Queue Managers 	Queue Manager HB of Connection QuickView:	n '9.20.233.27(2000)'
⊕ HB on '9.20.233.27(2000)'	Connection status	Connected
⊕ 2 QM1	Connection type	Citerit
⊕- <mark>∭</mark> QM2	Connection names	9.20.233.27(2000),9.20.233.17(2000)
⊕	Channel defeitien table	STSTEMUDEELSVBCUMM
E 💹 SSL	Defrech interval	300
🕀 🧀 Queue Manager Clusters	Autoreconnect	No
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MQShapes Modeling	Last updated: 16:12:13	
Service Definition Repositories	Status QuickView:	
	Oueue manager status	Running
	Command server status	
	Channel initiator status	Running
	Connection count	7
	Standby	Permitted
	Last updated: 16:12:13	
	Properties QuickView:	
	Queue manager name	НВ
	Description	
	Platform	Unix
	Command level	701
	Default transmission queue	
	Startup	
	Last updated: 16:12:13	
[L] 	L	

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Manage Instances

WebSphere MQ Ex	plorer - Eclipse SDK			
File Edit Navigate Sea	ar <mark>ch Project Debug R</mark> ur	n Window Help		
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8 WebSphere MQ Explor	rer - N 🕱 🦳 🗖 🚺	WebSphere MQ Explorer - Conter	nt 🖾 🧕 Error Log	폐 🛷 🏱 🗖 🗖
E 😳 IBM WebSphere I	<mark>n ← ↔ ♥</mark> Q MQ gers Co	ueue Manager QM1	on 'localhost(2000)'	
MQ1F on	'winmvs41.hursley.ibn	Connection status	Connected	
🕀 🔁 QM1		Connection type	lection type Client	
E U OM1 on 3	localbost(2000)	Connection names	localhost(2000),localhost(3001)	
Ca IMS Admini	Disconnect	nel name	SYSTEM.DEF.SVRCONN	
	Hide	nel definition table		
MQShapes			15	
Debug	Application Connections	, reconnect	No	
Service Def Publish/Subscribe Status		pdated: 13:32:45		
	Tests	>		
	Connection Details	Manage Instances		
	Security	 Autoreconnect 	Running	
	Object Authorities	Set Refresh Interval		
	Debug: Debug	Properties	Running	
	Debug. Debug	Properdes	7	
	Properties			
		pdated: 13:32:45		
	Pr	operties QuickView:		
		Queue manager name	OM1	
		Description		
		Platform	Windows	
		Command level	701	
		Default transmission queue		
		Startup		
<	>	Last updated: 13:32:45		
. □•				J.

Manage Instances dialog

Connection order	Connection status	Connection name	Channel name	Move Up
营 1	Connected	9.20.233.27(2000)	SYSTEM.DEF.SVRCONN	Marine Dista
9 2	Not connected	9.20.233.17(2000)	SYSTEM.DEF.SVRCONN	Luove Dow
				<u>A</u> dd
				Remove.
ast updated: 17:30:	:33			
ant connections				

Connection order used by MQ Explorer
 cannot remove connected instance details

Manage Instances – connection details

Add Connection Deta	ils	_ 🗆 🛛	🕒 IBM WebSphere MQ
Specify new connection Provide details for the conne	n details ction to the multi-instance queue manager		Please confirm 'ss' is a multi-instance queue manager. (AMQ4613)
Queue manager name: ss Instance Host name or IP address:	22222222		Yes No Details
Port number: Server-connection channel:	1414 SYSTEM. ADMIN. SVR CONN		BM WebSphere MQ
			You are about to remove the connection details 'aaaaaaa(1414)' to 'ss'. Are you sure that you want to continue? (AMQ4829)
0	Enish	Cancel	Yes No Details

Single page wizard for adding new connection details

Start/Stop Queue Manager dialogs

Start Queue Manager - "HA"	Stop Queue Manager - "HA"
Choose Start Method: Start as created Start as service Start interactive 	Choose Stop Method: Controlled Immediate
Multi-Instance Queue Manager:	Multi-instance Queue Manager:
⑦ OK Cancel	Reconnectable Clients:
	(?) OK Cancel

- Windows/Linux start dialog slightly different
- New control command flags "-x", "-s", "-r"

WebSphere MQ Best Practices

Good Bye, So Long and Thanks for the Fish !!!!!!!!!!!

