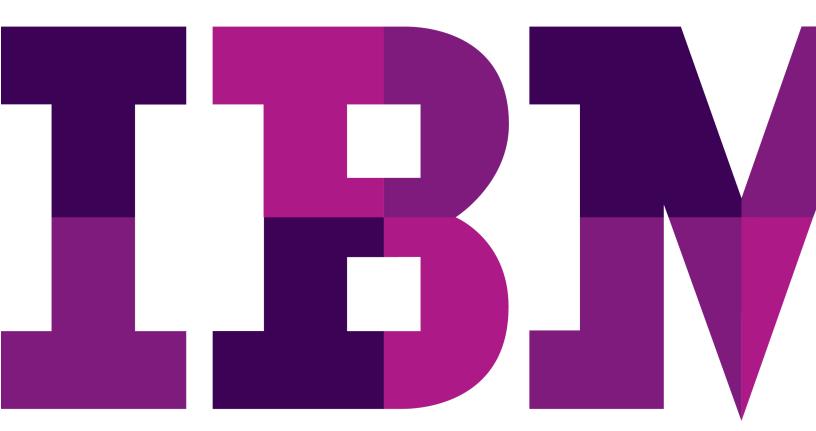
# WebSphere Lab Jam Connectivity WebSphere MQ

Lab Exercises





Catalog Number

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## Lab 1 Introduction to WebSphere MQ

In this lab you will be introduced to the WebSphere<sup>®</sup> MQ Explorer, the primary interface for administering a WebSphere MQ environment. You will have an opportunity to see how easy it is to create various MQ objects, view their status and manipulate them.

You will also exercise some basic command line facilities that will allow you to place messages onto queues and remove messages from queues.

## 1.1 Create a Queue Manager

Before you can do any useful work in a WebSphere MQ environment you must have a queue manager present.

\_\_\_1. The indicated icon in the lower right hand corner represents WebSphere MQ on this system.

🔂 🐉 🗊 😵 🟚 11:36 AM

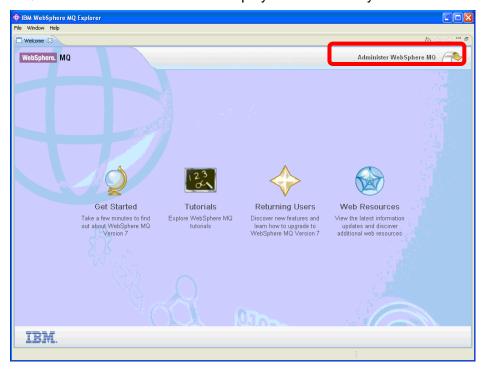
\_\_\_\_2. Start the MQ Explorer by **right-clicking** on the icon and selecting **WebSphere MQ Explorer** 



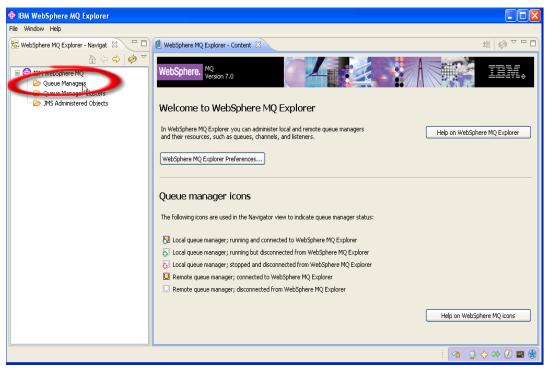
\_3. The welcome screen provides a nice selection of resources for the product. On the Menu Bar, click on **Help** and select **Welcome** to bring it into view

🕀 IBM WebSphere MQ Explorer		
File Window neip		
R webSph v Welcome	💋 WebSphere MQ Explorer - Content 🕺	≝ 🕺 – 🗖
WebSoft     Welcone     Pleb Contents     Onetal EM WebSohere MQ Explorer     Queue Managers     Queue Managers     M'S Administered Objects	WebSphere. Mg Version 7.0 Welcome to WebSphere MQ Explorer	HI & C
	Remote queue manager; connected to WebSphere MQ Explorer	
	Remote queue manager; disconnected from WebSphere MQ Explorer	
		Help on WebSphere MQ icons
	🗟 WebSphere MQ Explorer - Test Results 🛛	
	0 errors, 0 warnings, 0 infos	
	Description Object name Cates	gory
L		

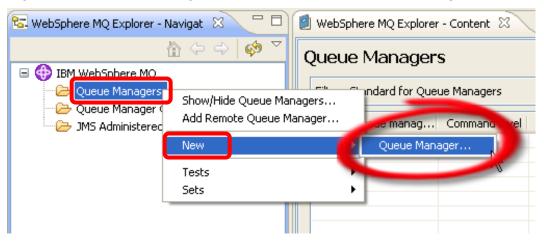
\_\_4. Note the various options on the Welcome screen and explore them if you would like. Then return to the MQ Explorer workbench by clicking the **Administer WebSphere MQ** icon in the upper right-hand corner. The first time you launch MQ Explorer after an install of WebSphere MQ this Welcome screen will be displayed automatically.



\_\_5. The left-hand pane in MQ Explorer is called the **Navigation pane**. In the navigation pane, locate the **Queue Managers** folder.



\_\_6. Right-click on Queue Managers and select New then Queue Manager...



\_\_7. Create a new queue manager and name it WMQ7. Check the box to make this the default queue manager. Note that the use of a default queue manager is not recommended in a production environment as it allows requests from a program or command to complete successfully without the inclusion of a queue manager name. We are using this option here in the labs as a convenience to reduce typing for you.

Important!!!!! Be sure to check the box that indicates this is the default queue manager!!!

If you do not do this you will have issues in future labs!!!!!

Specify **SYSTEM.DEAD.LETTER.QUEUE** as the **dead letter queue**, then click the **Finish** button.

🕀 Create Queue Manage	er 🚺	
Queue Manager Enter basic values (Step 1)		
Oueue manager name Make this the del ault que Default transmission queue:	WMQ7 ue manager	
Dead-letter queue:	SYSTEM.DEAD.LETTER.QUEUE	
Max handle limit:	256	*
Trigger interval:	999999999	*
Max uncommitted messages:	10000	*
?	Back Next > Einish	Cancel

\_\_8. The create queue manager process takes a few seconds during which time the following panel is displayed...

Creating Queue Ma	anager "WMQ7"	
TY	Executing WebSphere MQ Commands Please wait	
KTA	Creating Queue Manager Starting the Queue Manager	
	₹	>
Show details		

\_\_9. The newly created queue manager is displayed in MQ Explorer. In the Content pane on the righthand side you can see details about the queue manager, such as its status, the name of the dead letter queue, etc.

🕀 IBM WebSphere MQ Explorer								
File Window Help								
🔂 WebSphere MQ Explorer - Navi 🗴 🦳 🗖 🖉 WebSphere MQ Explorer - Content 🖇 👘 🖓 🖓 🖓								
IBM WebSphere MQ	⊇ 💠 🙋 🚬 Queue Managers							
ia-	Filter: Standard for Queue Managers							
- Queue Manager Clusters	🛆 Queue manager name	Command level	Queue manager status	Platform	Queue-sharing gr	Dead-letter queue		
🗁 JMS Administered Objects	💹 WMQ7	700	Running	Windows		SYSTEM.DEAD.LETTE		
	Scheme: Standard for Queue Mar Last updated: 13:00:22	nagers				>		
	Select a queue manager to show its	connection details h	ere:					
					1 🐴 🛛	) 💠 🚧 🕖 🖻		

This concludes this portion of Lab 1.

### **1.2 Testing Basic Functionality**

In this section of the lab you will create a local queue, place a test message in the queue, browse the message, clear it from the queue and finally delete the queue.

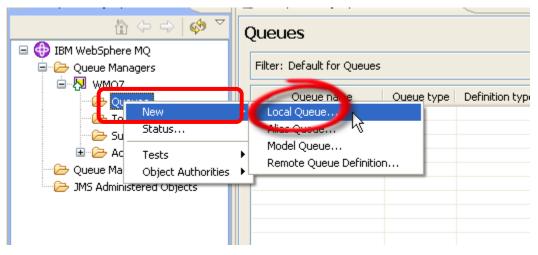
\_\_1. Expand the new **WMQ7** queue manager by clicking on the "+" symbol in front of it in the navigation tree.



\_\_\_2. Observe the tree structure that is displayed in the Navigator pane. There are separate folders for *Queues*, *Topics* and *Subscriptions*, as well as one labeled *Advanced*.

IBM WebSphere MQ Explorer							
File Window Help							
	🗐 WebSphere MQ Explorer - Conter	nt 83			41		
Image: WebSphere MQ     Image: WebSphere MQ							
Queue Managers	Filter: Standard for Queue Managers						
- 🗁 Queues	Queue manager name	Command level		Platform	Queue-sharing group name		
→ Topics → Subscriptions → Advanced → Queue Manager Clusters → JM5 Administered Objects	Image: Second		Running	Windows		SYSTM.DEAD.I	
						>	
	Scheme: Standard for Queue Mar	nagers				$\bigtriangledown$	
	Last updated: 12:48:37						
	Select a queue manager to show its	connection details h	ere:				

\_\_3. Now you will create a new queue. Within the WMQ7 queue manager right-click on Queues then select New then Local Queue.



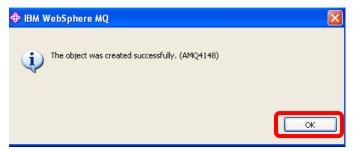
\_\_\_4. Name the new queue **QL01** then click on the **Next** button.

New Local Queue	
Create a Local Queue	
Enter the details of the object you wish to create	
Name	
QL01	
Select an existing object from which to copy the attributes for the new object.	
SYSTEM.DEFAULT.LOCAL.QUEUE	Select
When this wizard completes, another wizard can be started automatically to create a matching object.	
Start wizard completes, another wizard can be started automatically to create a matching object.	
⑦ < Back Next > Einish	Cancel

\_\_5. Note the variety of tabs on the left. There are many characteristics or properties for a queue. Explore some of them if so desired. In most cases you can utilize the defaults. For purposes of this lab you can accept all of the defaults – click **Finish** to create the queue.

Change properties Change the properties of t	he new Local Queue	
General Extended Cluster Triggering Events Storage Statistics	General Queue name: Queue type: Description: Put messages: Get messages: Default priority:	QL01 Local Allowed
0	Default priority:	< Back Next > Finish Cancel

\_\_6. Dismiss the completion panel by clicking on the **OK** button.



\_\_\_7. In the Content pane on the right-hand side the newly created queue is displayed along with its various properties. The **Current queue depth** property is a measure of how many messages are currently in the queue. Note that the current queue depth is 0 as you would expect since you just created the queue.

File Window Help						
🔁 WebSphere MQ Explorer 🛛 🦳 🗖	🗐 WebSphere MQ Explorer	- Content 🔀			北川	🐚 🕼 🗸 🗖 🗖
A ← → Ø ▼ BM WebSphere MQ	Queues					
	Filter: Default for Queues					
	🛆 Queue name	Queue type	Definition type	Open input count	Open output count	Current queue d
Topics	🖸 QL01	Local	Predefined	0	0	0
Subscriptions						
🖻 🗁 Advanced						
JMS Administered Objects						
	<					5
	Scheme: Default for Que	ues - Distributed	1			•
	Last updated: 13:12:41					
					: 👝 🔿	s 🕹 🕖 🖪 🍘
						🔶 🖙 🕖 🖭 🌚

\_\_\_8. Next you will place a message in the queue. **Right-click** on the **QL01** queue and select **Put Test Message**.

Filter: Default for Queues									
Queue name Queue type Definition type Open input count Open output count Current queue d									
QL01	Compar	re with	Predefined	0	0	0			
	Status. Delete,								
(	Put Tes	lessages it Message Messages							
		ama Queue Authorities	•			>			
	Propert	ies es - Distributeu							

\_\_\_9. Enter a test message by typing something of your choosing in the **Message data** field and click on the **Put message** button.

Put test message	
Put message to:         Queue manager:         WMQ7         Queue:         QL01         Message data:         My First Message         ① The queue which will receive the test message is on this computer. The message will be put directly on the queue.	
Put message	⊆lose

\_\_10. Close the Put test message panel by clicking on the **Close** button.

Put test message	
⊂Put message to:	
Queue manager:	
WMQ7	
Queue:	
QL01	
Message data:	
(1) The queue which will receive the test message is on this computer. The message will be put directly on the queue.	
	~
Put message	Close

When you return to the display of queues, note that the **Current queue depth count is now 1**. This represents the test message you just placed into the queue.

=ilter:	Default for Queues	i					•
~	Queue name	Queue type	Definition type	Open input count	Open output county		queue
🖻 QL	01	Local	Predefined	0	0	1	
<							>

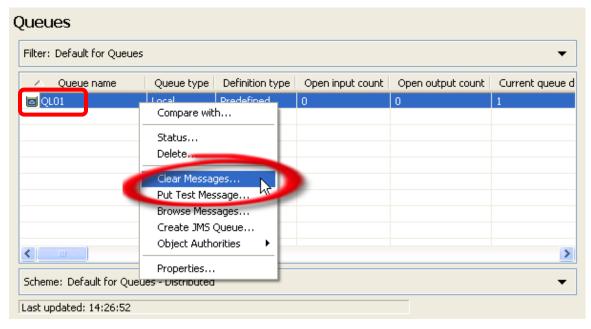
\_\_\_11. You can view details about the messages on a queue – **right-click** on queue **QL01** and select **Browse Messages**.

Queues					
Filter: Default for Que	eues				•
🛆 Queue name	Queue type	Definition type	Open input count	Open output count	Current queue d
CLOI	Compare will Status Delete Clear Messa Put Test Me Browse Mess Create IMS Object Auth Properties	oor ssage oueuc v orities	0	0	1
Last updated: 13:29:0	12				

\_\_\_12. Here is the resulting display. Note that there is a **scroll bar** at the bottom that allows you to view additional data that is not currently in view. There will be one such line displayed for each message in the queue. Click on the **Close** button.

Message browser Queue Manager Name Queue Name:								
<ul> <li>Position</li> </ul>	Put date/time	User identifier	Put application name	Format	Data lengt	Message data	counting token	
1	11-Jan-2008 13:19:58	student	re MQ\java\jre\bin\javaw.exe	MQSTR	16	My First Message	01051500000092E03C77F239B634	
Scheme: Default fo							<b>∑</b>	
Last updated: 13:29:37         ① All available messages on the queue have been browsed. Press the refresh button for new messages.								
	ssages on the queue have	been browsed.	rress the refresh batton for new	messayes	·		Refresh	

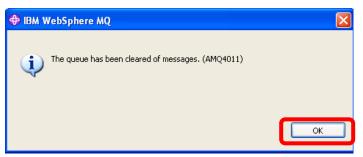
\_\_\_13. You will now delete your test message from the queue. **Right-click** on queue **QL01** and select **Clear Messages**....note that this action will remove <u>all</u> messages from the queue.



\_\_14. Accept the default selection of using the CLEAR command. This option cannot be used if any application has the queue open. In that case the second option would be required. Click on the Clear button.

🖾 Clear queue	
Queue manager name: WMQ7 Queue name: QL01	
Queue will be cleared using CLEAR command Queue will be cleared using MQGET API calls	

\_\_15. Click on the **OK** button to dismiss the confirmation panel.



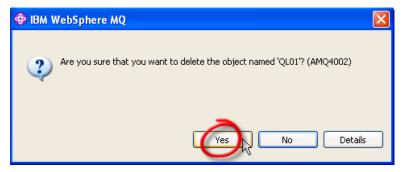
You can now see that the queue is indeed empty.

Queues								
Filter: Default for Queues								
🛆 Queue name	Queue type	Definition type	Open input count	Open output count	Current queue d			
🖸 QL01	Local	Predefined	0	0	0			
<					>			
Scheme: Default for Qu	eues - Distributed				•			
Last updated: 14:28:23								

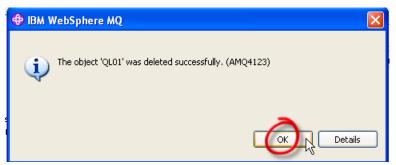
\_\_\_16. You will now delete the queue. Right-click on the QL01 queue and select Delete...

;				-
Queue type	Definition type	Open input count	Open output count	Current queue
Compare with		0	0	0
Delete	he			
Clear Nessag	es			
Put Test Mess	age			
Browse Messa	ages			
Create JMS Q	ueue			
Object Autho	rities 🕨			
Properties				3
	Queue type Compare with Status Delete Clear Messag Put Test Mess Browse Messa Create JMS Q	Queue type Definition type Compare with Status Delete Clear Messages Put Test Messages Browse Messages Create JMS Queue	Queue type       Definition type       Open input count         Compare with       0         Status       0         Delete       0         Clear Nessages       0         Put Test Messages       0         Browse Messages       0         Create JMS Queue       0	Queue type       Definition type       Open input count       Open output count         Compare with       0       0         Status       0       0         Delete       0       0         Clear Nessages       0       0         Put Test Message       0       0         Greate JMS Queue       0       0

\_\_17. Confirm the request by clicking on the **Yes** button.



\_\_\_18. Dismiss the confirmation panel by clicking on the **OK** button.



This concludes this portion of Lab 1.

### 1.3 Grouping Queue Managers

In this portion of the lab you will use a feature of MQ Explorer that allows grouping of queue managers into Sets. This offers a convenient way to view and/or manage a subset of queue managers. A particular queue manager may be a member of one Set or many Sets or no Set at all. The only restriction is that a Set may not contain another Set.

Using the MQ Explorer, you will now create the following queue manager and assign it the indicated port number for the listener:

WMQ7PROD  $\rightarrow$  port number = 1415

\_\_\_1. Right-click on Queue Managers and select New, then Queue Manager

🕀 IBM WebSphere MQ Exp	plorer							
File Window Help								
🕿 WebSphere MQ Explorer - N	lavigator 🛛 🗖 🗖	🗐 Web	Sphere MQ Explorer - Content	×			뵈	🚸 🗸 🗆 🗖
□ ⊕ IBM WebSphere MO □- <mark>→ Queue Managers</mark>	Č ↔ ↔ 🔅	Filter	Queue Managers Filter: Standard for Queue Managers					
Queues	Show/Hide Queue Managers Add Remote Queue Manage						Oueue-sharing group name	Dead-letter qu
- Courses -	New	•	Queue Manager	700	Running	Windows		SYSTM.DEAD.I
🗄 🗁 Advance	Tests	۰.						
🗁 Queue Manager (	Sets	•						
JMS Administered C	Dbjects							

\_\_\_2. Enter **WMQ7PROD** as the name and click the **Next** button.

🕀 Create Queue Manage	er	
Queue Manager		
Enter basic values (Step 1)		
Queue manager name		
Make this the default que	ue manager	
Default transmission queue:		
Dead-letter queue:		
Max handle limit:	256	*
Trigger interval:	999999999	*
Max uncommitted messages:	10000	*
0	KBack Next > Finish	Cancel

\_\_3. Click the **Next** button to accept these defaults....

🕀 Create Queue Ma	nager	
<b>Queue manager</b> Enter log values (Step 2	2)	
	-/	
	[	
Queue manager name:	WMQ7PROD	
	Use circular logging     Use linear logging	
Log path:	C:\Program Files\IBM\WebSphere MQ\log	Browse
Log file size: (x4KB)	4096	
Log primary files:	3	
Log secondary files:	2	
0	< Back Next > Finish	Cancel

\_\_\_4. Click the **Next** button to accept these defaults....

🕈 Create Queue Manager
Queue Manager Enter configuration options (Step 3)
Queue manager name: WMQ7PROD
Select type of queue manager startup Automatic Service (manual) Interactive (manual)
Configures the queue manager to start automatically when the machine starts up.
Create server-connection channel to allow remote administration of the queue manager over TCP/IP Create server-connection channel
Cancel

\_\_5. Enter **1415** as the p**ort number** and click the **Finish** button.

🕀 Create Queue Manager 💿 🖸 🔀
Queue Manager
Enter listener options (Step 4)
Queue manager name: WMQ7PROD
The queue manager needs a listener to monitor for incoming network connections, for some network protocols.
Create listener configured for TCP/IP
The listener needs to listen on a port number not used by any other queue
manager, service or application on this computer
Listen on port number: 1415
? < Back Next > Finish Cancel

Using MQ Explorer and the steps shown above, create another queue manager and assign it the indicated port number for the listener:

WMQ7QA01  $\rightarrow$  port number = 1416

\_\_\_6. Check the Content pane and make sure all three of the queue managers have been created, and that the **Queue manager status** for each is *Running*.

🗐 WebSphere MQ Explorer - Content 🛛 🥵 🏹 🗖 🗖							
Queue Managers							
Filter: Standard for Queue Manage	ers				$\bigtriangledown$		
🛆 Queue manager name	Command leve	Queue manager status	Platform	Queue-sharing group name	Dead-letter qu		
🔁 WMQ7	700	Running	Windows		SYSTM.DEAD.L		
🛃 WMQ7PROD	700	Running	Windows				
🖓 WMQ7QA01	700	Running	Windows				
					>		
Calculate Chandland for Overse Mar					$\overline{\nabla}$		
Scheme: Standard for Queue Man	ayers						
Last updated: 13:02:27							

\_\_\_7. To include Sets in the MQ Explorer display right-click on **Queue Managers** and select **Sets** then **Show Sets** 

🕀 IBM WebSphere MQ	Explorer						
File Window Help							
😪 WebSphere MQ Explore		WebSphere MQ Explorer - Conten	t 23			비	🚸 🕆 🗖 🗖
E 🕀 IBM WebSobere MU		Queue Managers Filter: Standard for Queue Manag	ers				▽
	Add Remote Queue Manager	🛆 Queue manager name	Command level	Queue manager status	Platform	Queue-sharing group name	Dead-letter qu
	New	WMQ7	700 700	Running Running	Windows Windows		SYSTM.DEAD.I
🗷 🗁 Adva	Torte	MWQ7QA01	700	Running	Windows		
B - 79 WMQ7P B - 79 WMQ7QA G - 20 WMQ7QA C - 20 WMQ7QA C - 20 WMQ7QA C - 70 WMQ7A C - 70 WM C -	r Clusters	New Set Manage Sets Show Sets Scheme: Standard for Queue Mar	agers				×
		Last updated: 13:03:34					

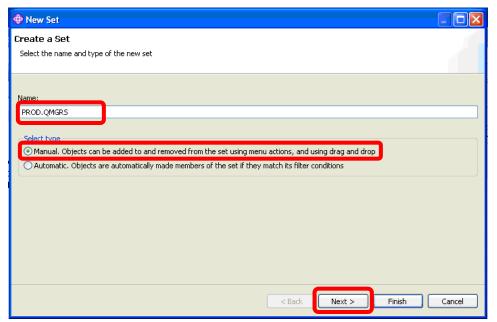
You now see that you have a **default set** called **All** that contains every queue manager that is defined.

🕀 IBM WebSphere MQ Explorer						
File Window Help						
😼 WebSphere MQ Explorer - Navigator 🛛 📃 🗖	🗐 WebSphere MQ Explorer - Conter	t 🛙			41	🚸 🗸 🗖 🗖
IBM WebSphere MQ	Queue Managers					
⊡ 🧽 Queue Managers ⊡ 证 All	Filter: Standard for Queue Manag	lers				
I IIII WMQ7	🛆 Queue manager name	Command level	Queue manager status	Platform	Queue-sharing group name	Dead-letter qu
🕀 🖓 WMQ7PROD	🛃 WMQ7	700	Running	Windows		SYSTM.DEAD.I
🖻 🖓 WMQ7QA01	MMQ7PROD	700	Running	Windows		
	🖓 WMQ7QA01	700	Running	Windows		
DMS Administered Objects						
						>
	Scheme: Standard for Queue Mar	nagers				$\bigtriangledown$
	Last updated: 13:05:13					

\_\_8. To define a new Set, right-click on **Queue Managers** and select **Sets** then **New Set**.

🗇 IBM WebSphere MQ Explorer							
File Window Help							
	🗐 WebSphere MQ Explorer - Contei	nt 🖾			4	¢ <sup>¬</sup> □ □	
Image: State	Queue Managers Filter: Standard for Queue Managers						
Add Remote Queue Manager	🗠 Queue manager name	Command level	Queue manager status	Platform	Queue-sharing group name	Dead-letter qu	
🕀 🐙 wm New 🕨	NMQ7	700	Running	Windows		SYSTM.DEAD.I	
i wm	- 🛃 WMQ7PROD	700	Running	Windows			
Queue Ian Sets	New Set	700	Running	Windows			
🧁 JMS Adaini	manage bets						
	Hide Sets						
	Scheme: Standard for Queue Ma	nagers				>	
	Last updated: 13:06:04						

\_\_9. Enter **PROD.QMGRS** as the name, leave the **Select type** as **Manual** and click on the **Next** button.



\_\_\_10. Click the check box for **WMQ7PROD** to indicate that this queue manager is to be included in the Set and click the **Finish** button

New Set					
Create a Set Select the queue managers that wil	l be members of this se	et			
					^
🛆 Queue manager name	Connection type	Connection name	Channel name	Channel definition table	Refresh inter
WM07	Local				15
🔽 🛃 WMQ7PROD	Local				15
	Local				15
<					>
Last updated: 13:09:04					
Select All Select None					-
					<u>×</u>
		(	< Back	Next > Finish	Cancel

\_\_11. Click on the plus sign to **expand** the **PROD.QMGRS** Set. Note that WMQ7PROD is a member of both the All Set and the PROD.QMGRS Set.

ile Window Help							
		WebSphere MQ Explorer - Conten	: 23			4	🗇 🍸 🗖
IBM WebSphere MQ       □     ⊕       □     ⊕       Queue Managers	~ (	Queue Managers Filter: Standard for Queue Manag	ers				~
		<ul> <li>Queue manager name</li> </ul>	Command level	Queue manager status	Platform	Queue-sharing group name	Dead-letter o
		N WMQ7	700	Running	Windows		SYSTM.DEAD
		WMQ7PROD	700	Running	Windows		
PROD.QMGRS		💹 WMQ7QA01	700	Running	Windows		
🖮 🖓 WMQ7PROD							
JMS Administered Objects							
							3
		Scheme: Standard for Queue Man	agers				~
		Last updated: 13:10:04					

Once a Set has been created you can take an action against the entire Set of queue managers by issuing a single request. For example you can:

- Show/Hide All
- Connect/Disconnect All
- Start/Stop All Local
- Run Default/Custom Tests

\_\_\_12. To take some joint action against a Set of queue managers right-click on the Set and choose the desired action in the pulldown list. Right-click on **PROD.QMGRS** and select **Stop Local Queue Managers**...

Ibm       I	le Window Help		-						
IBM WebSphere MQ       Queue Managers       Queue manager name       Command level       Queue manager status       Platform       Queue-sharing group name       Dead-letter         Image: I	WebSphere MQ Explorer - N	-	🔋 We	bSphere MQ Explorer - Conten	t 🛙			비	¢ 7 🗖
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Set Membership       Image: Comparison of the comparison of		Stop Local Oueue Managero							
New  Add Remote Queue Manager	-	Set Membership Edit Set							
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	_	Tests	•						>

\_\_\_13. Choose **Immediate** for the **Stop Method** (not a good option for a production queue manager!) and click **OK**.

🛡 Stop Local Queue Managers In Set - "PROD.QMGRS" 🛛 🛛 🔀
eal All local queue managers in the set 'PROD.QMGRS' will be stopped
Choose Stop Method: O Controlled Immediate
⑦ OK Cancel

\_\_\_14. After a few seconds the queue manager will show a status of **stopped**. Click the **Close** button to remove the Set Action panel.

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☆ ↔ 0	🗧 🚸 🎽 Oueue Managers Set	t PROD.QMGRS [manual set]	
🖃 🌐 IBM WebSphere MQ			
ia - Managers ia - Managers	Set Action - Stop Local Queue Manag	ers Queue-shari	ng group name Dead-letter qu
<ul> <li>● - 契 WMQ7</li> <li>● WMQ7PROD</li> <li>● - 契 WMQ7QA01</li> </ul>	Completed: All local queue managers are stopp		
BROD.QMGR5	Queue Manager	Status	
Cueue Manager Clusters	🐼 WMQ7PROD	Stopped	
JMS Administered Objects			
	Select a queue manager to show its action deta	ails here:	
	Details		>
	0		
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In the previous example, you performed your queue manager grouping in a manual fashion. Grouping can also be done automatically based on a filter you specify. To illustrate this you will create another Set and define it so that it will automatically add the appropriate queue manager(s) to the Set based on a portion of the queue manager name.

\_\_\_15. Right-click on Queue Managers and select Sets then New Set.

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Image: State of the	Queue Managers	gers				▽
Add Remote Queue Manager	<ul> <li>Queue manager name</li> </ul>	Command level	Queue manager status	Platform	Queue-sharing group name	Dead-letter qu
	🕨 🕅 WMQ7	700	Running	Windows		SYSTM.DEAD.I
🛓 🔛 WMQ	- 🛃 WMQ7PROD	700	Stopped	Windows		
BROD.O	New Set	700	Running	Windows		
Geueue Manager Clusters George JMS Administered Objects	Hide Sets Hide Sets Scheme: Standard for Queue Ma Last updated: 13:17:17	nagers				>

\_\_\_16. Name the Set **QA.QMGRS**, select **Automatic** and click the **Next** button.

New Set	
Create a Set	
Select the name and type of the new set	
Name:	
QA.QMGRS	
Select type	
Manual. Objects can be added to and removed from the set using menu actions, and using draft and drop     Automatic. Objects are automatically made members of the set if they match its filter conditions	
< Back Next > Finish	Cancel

\_\_\_17. This panel shows some predefined filters that can be used to choose queue managers for this Set. You can see that you could filter based on WebSphere MQ version and release level or on the operating system platform the queue manager is running on. You are going to create a new filter. Click on the **Manage Filters** button

🕀 New Set		
Create a Set 8 No filters selected		
An object will be a member of this set if it:	matches ALL the selected filters     matches ANY of the selected filters	
Available filters:	Selected filters:	
Command level = 500           Command level = 510           Command level = 520           Command level = 521           Command level = 530           Command level = 600           Command level = 700           Platform = Compaq O/VMS           Platform = S/OS           Platform = OS/2           Platform = OS/2           Platform = Unix           Platform = 2/OS           Standard for Queue Managers	Add ->	
Manage Filters		
	< Back Next > Finish	Cancel

\_\_\_18. Next, click the **Add** button to indicate that you want to add a new filter.

🕀 Manage Filters	
Filter:	
Command level = 500           Command level = 510           Command level = 520           Command level = 521           Command level = 530           Command level = 600           Command level = 700           Platform = Compaq O/VMS           Platform = IS/OS           Platform = NSK           Platform = OS/2           Platform = Windows           Platform = Windows	
Platform = z/OS Standard for Queue Managers	_
Add Copy As Edit Remove	
0	OK Cancel

\_\_\_\_19. Enter **QA** qmgrs prefixed by WMQ7QA for the **Filter Name**. Enter WMQ7QA\* for the **Queue** manager name like field. The \* is a wild card in this case....any queue manager name that begins with WMQ7QA will satisfy this filter. Click the **OK** button.

🗢 Add Filter	×
Filter Name: QA gmgrs prefixed by WMQ7QA	
de duge provide by write de	
Include Queue Managers where:	
Queue manager name like WMQ7QA*	
- AND -	
Accounting conn override equal to	
Automatically apply a Column Scheme when this filter is applied	
Standard for Queue Managers	~
⑦ Clear	OK Cancel

\_\_\_\_20. The new filter now appears in the filter list. Click the **OK** button.

🗢 Manage Filters	×
Filter: Command level = 500 Command level = 510 Command level = 520	
Command level = 521 Command level = 530 Command level = 600 Command level = 700 Platform = Compaq O/VM5 Platform = IS/OS Platform = NSK	
Platform = OS/2 Platform = Unix Platform = Windows Platform = z/OS QA gmgrs prefixed by WMQ7QA Standard for Queue Managers	
Add Copy As Edit Remove	
() CK Cancel	

\_\_\_21. Click the QA qmgrs prefixed by WMQ7QA in the Available filters list to select it then click the Add button to move it to the Selected filters box.

New Set		
Create a Set		
🔕 No filters selected		
An object will be a member of this set if it:	matches ALL the selected filters     matches ANY of the selected filters	
Available filters: Command level = 500	Selected filters:	
Command level = 500           Command level = 520           Command level = 520           Command level = 521           Command level = 530           Command level = 600           Command level = 700           Platform = Compaq O/VMS           Platform = NSK           Platform = NSK           Platform = Unix           Platform = Windows           QA qmgrs prefixed by WMQ7QA           Command rol - 20000 managers	Add -> <- Remove	
Manage Filters		
	<back next=""> Finish C</back>	Tancel

\_\_\_22. Then click **Finish**.

n object will be a member of this set if it:	<ul> <li>matches ALL the selected filte</li> <li>matches ANY of the selected</li> </ul>	
vailable filters: Command level = 500		Selected filters: QA gmgrs prefixed by WMQ7QA
Command level = 510 Command level = 520 Command level = 521 Command level = 530 Command level = 600 Command level = 700 Platform = Compaq O/VMS Platform = IS/OS Platform = NSK Platform = OS/2 Platform = Unix Platform = Unix Platform = 2/OS Standard for Queue Managers	Add ->	

\_\_23. In the main MQ Explorer menu you can see that the new Set has been created and queue manager WMQ7QA01 has been automatically added to the QA.QMRGRS group as it satisfied the filter you specified.

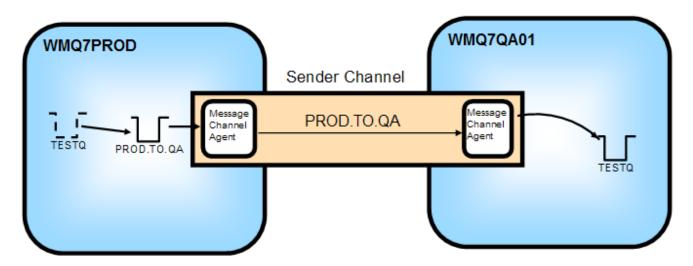
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Queue Managers	Filter: Standard for Queue Managers				▽	
aria Ali aria MMQ7	🛆 Queue manager name	Command level	Queue manager status	Platform	Queue-sharing group name	Dead-letter qu
	WMQ7	700 700	Running Stopped	Windows Windows		SYSTM.DEAD.I
PROD.QMGR5	WMQ7QA01	700	Running	Windows		
- C QA. QMGRS						
الله · 妃 WMQ7QA01						
- 🗁 JMS Administered Objects						
						>
	Scheme: Standard for Queue Managers					
	Last updated: 13:50:33					

If you created a new queue manager whose name satisfied your filter it would also get automatically added to the QA.QMRGS Set.

This is the end of this portion of Lab 1

### 1.4 Distributed queuing

Your next step will be to explore distributed queuing. Since the primary reason to have an enterprise messaging product like WebSphere MQ is to move messages reliably between systems, this lab will give you a simple example of the steps involved in connecting two queue managers and moving messages between them. Here is a diagram of the configuration you will create:



Here are the MQ objects you will be creating and working with:

#### WMQ7PROD:

- A Remote queue definition called TESTQ
- A Transmission queue called PROD.TO.QA
- A Sender Channel called PROD.TO.QA

#### WMQ7QA01:

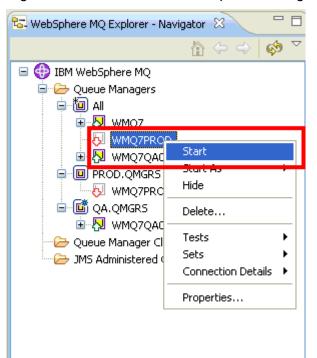
- A Local queue called **TESTQ**
- A Receiver Channel called PROD.TO.QA

You will then use one of the sample programs supplied with WebSphere MQ (called amqsput) to send messages from the WMQ7PROD queue manager, and another sample program called amqsget to read those messages off the destination queue on WMQ7QA01.

\_\_\_1. In a previous step you stopped the WMQ7PROD queue manager. You want to restart it now. In the navigator pane, you should see the icon representing the WMQ7PROD queue manager with a **red** arrow pointing <u>down</u>, as in the picture below; this indicates that the queue manager is stopped (a **green** arrow pointing <u>up</u> indicates that the queue manager is running).



\_\_\_2. Right-click on the WMQ7PROD queue manager, and select **Start**, as shown below.



 Starting Queue Manager "WMQ7PROD"

 Executing WebSphere MQ Commands

 Please wait...

 Starting Queue Manager

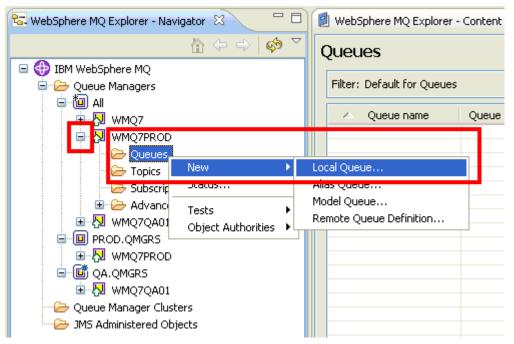
 Starting Queue Manager

 Show details

You will see a pop-up like the one below for several seconds while the queue manager starts.

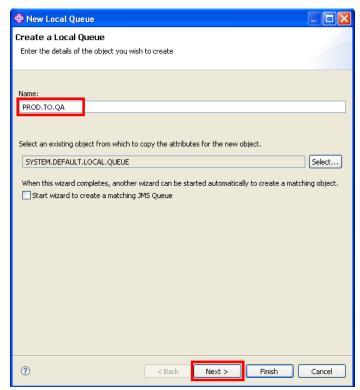
With WMQ7PROD running, you will now go through the steps needed to connect it to WMQ7QA01.

\_\_3. First you will create a *Transmission queue*. Click on the plus sign next to WMQ7PROD to expand the tree, and then right-click on the **Queues** folder, select **New** and then **Local Queue**...



A Transmission queue is a special type of local queue, associated with a Sender Channel that holds messages safely until they are transferred to the queue manager on the other end of the channel. A typical nomenclature used for naming transmission queues and channels is *<sourceqm>.TO.<targetqm>*. You will use an abbreviated form for purposes of this lab, calling the transmission queue **PROD.TO.QA**.

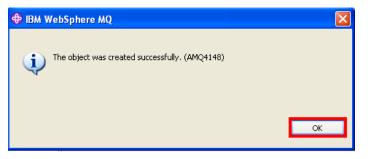
\_\_\_4. Enter the name **PROD.TO.QA** as shown below, and click **Next** 



\_\_5. Since this queue will be used as a transmission queue, indicate that by using the dropdown labeled **Usage**, and click **Finish** 

🕀 New Local Qu	ieue		
Change propert	ties		
Change the proper	ties of the new Local Q	ueue	
General	General		
Extended Cluster	Queue name:	PROD.TO.QA	
- Triggering Events	Queue type:	Local	
Storage Statistics	Description:		
	Put messages:	Allowed	~
	Get messages:	Allowed	*
	Default priority:	0	×
	Default persistence:	Not persistent	~
	Scope:	Queue manager	~
	Usage:	Normal	~
		Normal Transmission	
0		< Back Next > Finish	Cancel

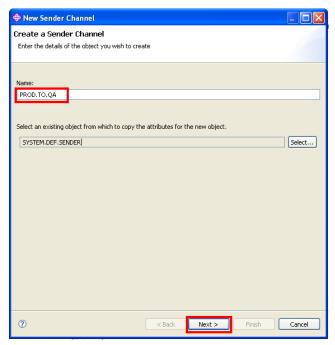
\_\_6. Click OK on the confirmation popup



\_\_\_7. Next you will create the Sender Channel this transmission queue will be associated with. Click on the plus sign next to the **Advanced** folder under WMQ7PROD to expand the tree, and then right-click on the **Channels** folder, select **New** and then **Sender Channel** 

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<u>^</u>	⇔ ⇒   🔅 ▽		Ch	annels	
🖃 💮 IBM WebSphere MQ			_		
🖨 🗁 Queue Managers			Fil	ter: Default for Channels	;
📮 🛅 All					
😟 🐶 wmq7				<ul> <li>Channel name</li> </ul>	Channe
🖨 💀 WMQ7PROD					
Queues					
🔁 Topics					
🖃 🗁 Advanced					
- 🗁 Channels					
Client Co	New	þ	2	Sender Channel	-
🗁 Listeners	Status	)	2	erver Channel	
Services	Tests	,	F	Receiver Channel	
🗁 Process 🛙			F	Requester Channel	
🗁 Namelists	Object Authorities		2	Server-connection Chann	el
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🖻 🖓 WMQ7QA01			0	Iluster-receiver Channel.	
🖃 🔟 PROD.QMGRS					

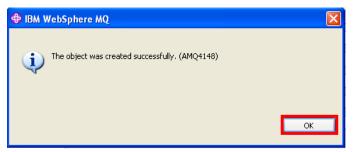
\_\_\_8. Enter the name **PROD.TO.QA** as shown below, and click **Next**.



\_\_\_9. You now need to identify the network location of the queue manager this channel is to connect to. Remember when you created the WMQ7QA01 queue manager, you assigned it a listener port of 1416. Specify that now, using **localhost** as the **Connection name**, as shown below. Also enter the name of the **Transmission queue** you created earlier, **PROD.TO.QA**. Then click **Finish**.

New Sender Channel			
Change properties Change the properties of the ne	w Sender Channel		
General Extended - MCA Exits - LU6.2 Retry SSL Statistics	General Channel name: Type: Description: Transmission protocol: Connection name: Transmission queue: Local communication address:	PROD.TO.QA Sender [ TCP [localhost(1416) PROD.TO.QA	
0		< Back Next > Finish	Cancel

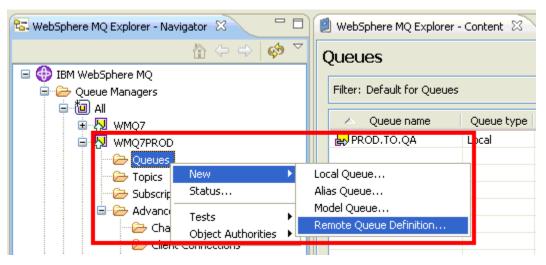
\_\_10. Click OK on the confirmation popup. The channel has been created.



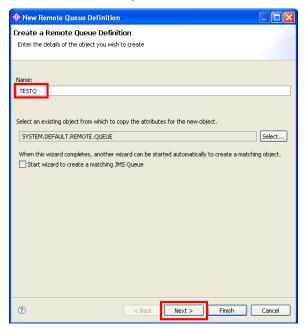
\_\_\_11. In the Content pane on the right-hand side, you should see the details of the channel you just created. Notice that, in addition to the name, you see listed the **Channel type** of *Sender*, the **Overall channel status** as *Inactive*, and a **Conn name** of *Iocalhost(1416)* 

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🖨 🗁 Queue Managers	Filter: Default for Channe	els				
i⊐ 🛅 All						
😥 👧 WMQ7	🛆 Channel name	Channel type	Overall channel status	Conn name	Xmit protocol	Transmission queue
🖨 🖓 WMQ7PROD	👎 PROD.TO.QA	Sender	Inactive	localhost(1416)	TCP	PROD.TO.QA
- 🗁 Queues						
🗁 Topics						
		Indicate				
🖻 🗁 Advanced		chann				
- 🗁 Channels		not ac	tive			
Client Connections						

\_\_12. The last task remaining on WMQ7PROD is to create a Remote queue definition. This definition will act as an alias of the real target queue that you will be creating shortly on WMQ7QA01. To create the remote queue definition, right-click on the **Queues** folder under WMQ7PROD, select **New** and then **Remote Queue Definition**...



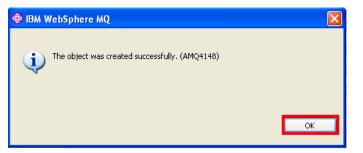
\_\_13. Name the remote queue definition **TESTQ**, and click **Next** 



\_\_\_14. Identify the name of the **Remote queue** (i.e. the name of the actual target queue) as **TESTQ**. Specify the **Queue manager name** where the target queue resides (**WMQ7QA01**), and indicate the **Transmission queue** to be used to reach that queue manager (**PROD.TO.QA**). When those have been entered, click **Finish**.

🕀 New Remote Queue	Definition		
Change properties Change the properties of	the new Remote Queue Def	inition	
General Extended Cluster	General Queue name: Queue type: Description: Put messages: Default priority: Default priority: Default persistence: Scope: Remote queue: Remote queue manager: Transmission queue:	TESTQ Remote I Allowed 0 Not persistent Queue manager TESTQ WMQ7QA01 PROD.TO.QA	
0	< <u>B</u> ack	Next > Einish	Cancel

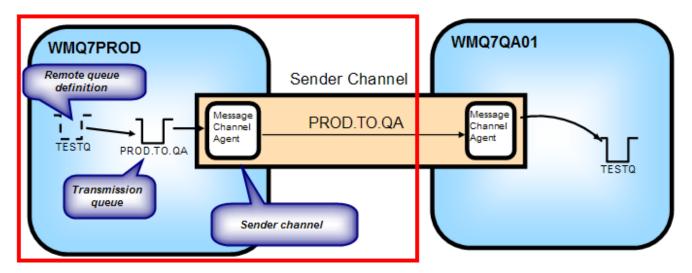
\_\_15. Click OK on the confirmation popup. The remote queue definition has been created.



\_\_\_16. You should now see your new queue definition under WMQ7PROD, with a **Queue type** of **Remote** 



Let's review what you have configured so far. Look at the left-hand side of the diagram below:



On WMQ7PROD you created a Remote queue definition of TESTQ, which points to a Transmission queue called PROD.TO.QA, which is associated with a Sender channel also called PROD.TO.QA that will connect to WMQ7QA01.

With the Sender side setup complete, you now need to create the corresponding definitions on WMQ7QA01.

\_\_\_17. You previously created a Remote queue definition called TESTQ. As mentioned then, this definition is an alias for the actual local queue you are about to create.

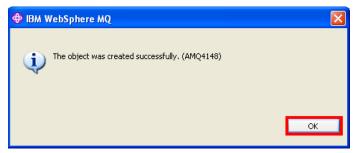
Expand the folder tree for queue manager WMQ7QA01, right-click on the **Queues** folder, click **New**, then **Local Queue**...

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		∲ ~	Queues
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WMQ7     WMQ7     WMQ7PROD     D     WMQ7QA01     WMQ7QA01     WMQ7QA01			△ Queue name Que
- 🗁 Topics	New	•	Local Queue
🗁 Subscrip	Status		Alias Queue
Advance Cha Cha Lister	Tests Object Authoritie Ters	s Þ	Model Queue Remote Queue Definition

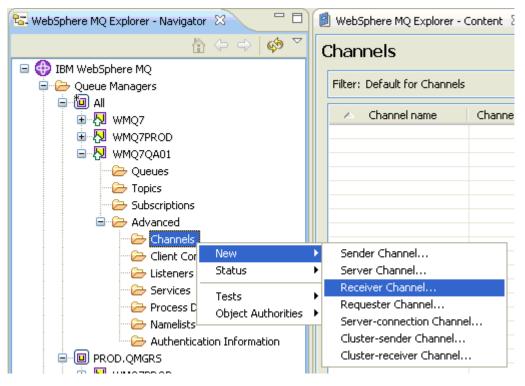
\_\_\_18. Enter **TESTQ** as the Name. The default values are acceptable for this queue, so click **Finish**.

New Local Queue	
Create a Local Queue	
Enter the details of the object you wish to create	
Name:	
TESTQ	
Select an existing object from which to copy the attributes for the new object.	
SYSTEM.DEFAULT.LOCAL.QUEUE	Select
When this wizard completes, another wizard can be started automatically to create a matchin	a obiect.
Start wizard to create a matching JMS Queue	
	- Current - L
C Sack Next > Finish	Cancel

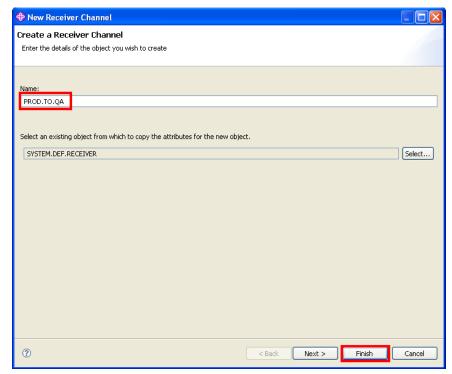
\_\_\_19. Click OK on the confirmation popup.



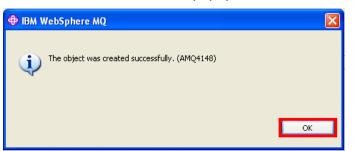
\_\_20. Next you will create the Receiver Channel. This channel must have the same name as the corresponding Sender channel you created earlier. Expand the Advanced folder tree under WMQ7QA01, right-click on the Channels folder, then select New, then Receiver Channel...



\_\_\_21. Enter the name **PROD.TO.QA** as shown below. No other properties are required for a Receiver channel, so click **Finish**.



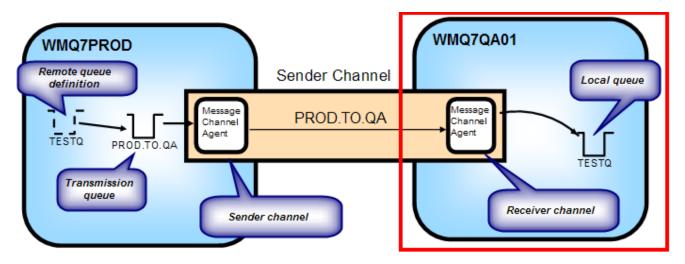
\_\_\_22. Click OK on the confirmation popup. The channel has been created.



\_\_23. In the Content pane on the right-hand side, you should see the details of the channel you just created. You should see the Name, PROD.TO.QA, with a Channel type of Receiver and an Overall channel status of Inactive.

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	Channels
🖃 🜐 IBM WebSphere MQ	
🖨 🗁 Queue Managers	Filter: Default for Channels
iantia All	
	Channel name Channel type Overall channel status
	PROD.TO.QA Receiver Inactive
Queues	
Topics	
- 🗁 Subscriptions	
🖻 🥟 Advanced	
Channels	

Your configuration should now be complete. Let's review what you have configured, looking at the righthand side of the diagram below:



On WMQ7QA01 you created a Local queue called **TESTQ**, which will be the target queue for your test. You also created a **Receiver channel** as a partner for the Sender channel you created in WMQ7PROD, called **PROD.TO.QA**.

With the Receiver side setup complete, you are now ready to test your configuration and see how WebSphere MQ moves messages.

\_\_\_24. Launch a command window by clicking the icon found on the taskbar



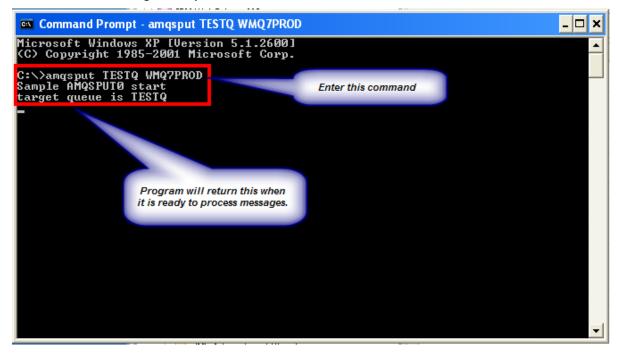
\_25. For testing the putting (or sending) side, you will use a sample program supplied with WebSphere MQ called amqsput. The format of this command is:

#### amqsput <q\_name> <qmgr\_name>

For your test, you will be putting messages to the TESTQ remote queue definition on queue manager WMQ7PROD, so enter the following command:

#### amqsput TESTQ WMQ7PROD

You should see the following when you enter this in the command window:



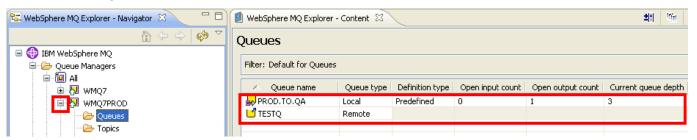
The amqsput sample program will take each line of text that you enter, and put each line as a separate message to the named queue.

\_26. Enter three lines of text, as shown below:



Each line will be put on the target queue as a separate message.

\_27. Return to the MQ Explorer. In the Navigator pane, if necessary, expand the tree under WMQ7PROD by clicking the plus sign, and select the **Queues** folder. You should see the following:



Look at the **Current queue depth** column and consider what you see here. Notice that TESTQ has no messages, and in fact this field is grayed out. Why???

Remember that a remote queue definition is like an <u>alias</u>; it is not an actual queue, but is instead a *reference* to one. In this case, it is a reference to the *transmission queue* associated with the channel that points to the queue manager where the actual TESTQ instance resides. If you look at the current queue depth of transmission queue **PROD.TO.QA** you see that it contains three messages. But why are they sitting here??? Why haven't they been transferred to the WMQ7QA01 queue manager?

\_\_28. To find out, click on the Channels folder on queue manager WMQ7PROD, and look at the Overall channel status for Channel PROD.TO.QA. Notice that the channel is Inactive! In order to move messages, the channel must have a status of Running. It is possible to configure the channel such that it will start *automatically* when a message arrives on its transmission queue, but we did not do that for purposes of this lab. Instead, you will start the channel manually.

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□ ⊕ IBM WebSphere MQ □ ← Queue Managers □ ← 10 All	Filt	er: Default for Channels					
		<ul> <li>Channel name</li> </ul>	Channel type	Overall channel status	Conn name	Xmit protocol	Transmission queue
WM07PROD     Client Connections		PROD.TO.QA	Sender	Inactive	localhost(1416)	TCP	PROD.TO.QA

\_\_\_29. Right-click on the **PROD.TO.QA** Sender channel entry, and click **Start** 

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(⇔ ⇔   🔅 ▽	Channels					
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🚊 🗁 Queue Managers	Filter: Default for Ch	annels				
⊨ 👜 All						
	🛆 Channel name	e Channel type	Overall channel status	Conn name	Xmit protocol	Transmission queue
🖨 🛃 WMQ7PROD	💎 PROD.TO.QA	Sender	Inactive	localhost(1416)	ТСР	PROD.TO.QA
Queues		Compare with				
		Charle				
		Start				
- Advanced						
- 🗁 Channels		Resolve				
Client Connections		Ping				
- 🗁 Listeners		Reset				
- 🤂 Services		Status	•			
		Delete				
- 🗁 Namelists						
Authentication Information		Object Authorities				
		Properties				

\_\_\_30. Click **OK** on the confirmation popup.



\_31. Returning to the Overall channel status, you may see it go through several states (Initializing, Binding, etc) over a few seconds until it reaches **Running** status, as shown below

🔁 WebSphere MQ Explorer - Navigator 🛛 📃 🗆	🕑 We	bSphere MQ Explorer - (	Content 🛛				11 (
📩 🗘 🗘 🤹	Cha	nnels					
🖃 🚯 IBM WebSphere MQ							
🖨 🗁 Queue Managers	Filte	er: Default for Channels					
😑 🛅 All			L - L - L - L - L - L - L - L - L - L -		-		
😟 🖓 WMQ7		Channel name	Channel type	Overall channel status		Xmit protocol	Transmission queue
🖨 🔛 WMQ7PROD	1	PROD.TO.QA	Sender	Running	localhost(1416)	TCP	PROD.TO.QA
Queues							
🥭 Topics							
Subscriptions							
Advanced							

\_\_32. With the channel now running, click on the Queues folder again for queue manager WMQ7PROD, and look at the Current queue depth for transmission queue PROD.TO.QA. Notice that now the queue is empty.

🔁 WebSphere MQ Explorer - Navigator 🛛 🦳 🗖		WebSphere MQ Explorer	- Content 🖾				<b>当</b> 副 - 「「」
(⇔ ⇔   🔅 ▽	Q	ueues					
🖃 🚯 IBM WebSphere MQ							
🖨 🧀 Queue Managers		Filter: Default for Queue	s				
e 🗓 All							
🗉 🔛 WMQ7		🛆 Queue name	Queue type	Definition type	Open input count	Open output count	Current queue depth
		PROD.TO.QA	Local	Predefined	1	2	0
Queues		🗂 TESTQ	Remote				
Topics							
- 🗁 Subscriptions							
🖃 🗁 Advanced							
Client Connections							

\_\_33. In the MQ Explorer navigator pane, expand the tree below the **WMQ7QA01** queue manager, click on the **Queues** folder, and look at the **Current queue depth** for Queue **TESTQ**. Notice the queue depth of the target queue is three, indicating that your messages have been moved here from the WMQ7PROD queue manager.

IBM WebSphere MQ Explorer						
File Window Help						
😼 WebSphere MQ Explorer - Navigator 🛛 🦳 🗖	UwebSphere MQ Explorer	Content 🕄				<b>±</b> 1 1%
IBM WebSphere MQ       □     ⊕       □     ⊕       □     ⊕	Queues Filter: Default for Queues					
ie · 恒 All ● · 炅 WMQ7 ● · ワ WMQ7PBOD	Queue name TESTQ	Queue type Local	Definition type Predefined	Open input count 0	Open output count 0	Current queue depth
WMQ7QA01  Uueues  Topics						
Subscriptions						
Channels						

\_34. To confirm that these are actually the messages that you put using amqsput, you will use another sample program supplied with WebSphere MQ, called amqsget. Open another command window by clicking the icon found on the taskbar



\_\_35. The amqsget sample program will open the specified queue and wait for messages. The format of this command is:

#### amqsget <q\_name> <qmgr\_name>

For your test, you will be getting the messages from the TESTQ local queue definition on queue manager WMQ7QA01, so enter the following command:

#### amqsget TESTQ WMQ7QA01



You should see the following when you enter this in the command window:

If you wish, you can go back to the amqsput window and enter some more lines of text. If you then return to the amqsget window, you will see that the messages are delivered immediately (or nearly so), because the channel is now running.

Note: The amqsget program is designed to end after 15 seconds if no messages arrive on the queue; consequently, it's possible that the program will end before you can send your messages. If this happened, just restart the program.

When your testing is complete, terminate amqsput by just hitting the Enter key with no input text. Let amqsget terminate by waiting for the 15 second timeout to expire. Then close the two command windows.

This is the end of this portion of Lab 1

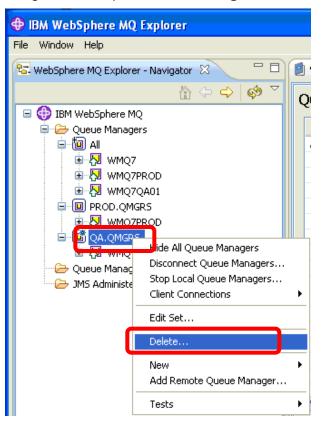
## 1.5 Lab Cleanup

Since you will make no further use in future labs of the last two queue managers you created, you are going to delete them.

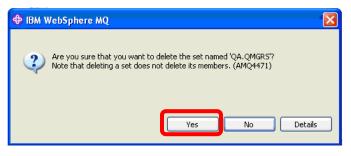
First you will remove the two Sets you created as they contain only these queue managers and would be empty after the queue managers are deleted.

Then you will stop the queue managers as you cannot delete one that is running. And then you will delete them.

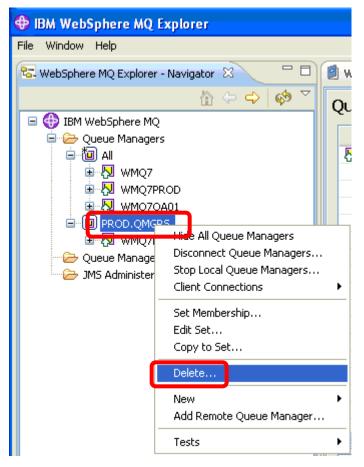
\_\_\_1. Bring the MQ Explorer into view, **right-click** on the **QA.QMGRS** Set and select **Delete**.



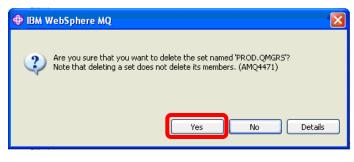
\_2. Confirm the delete by clicking on the Yes button...



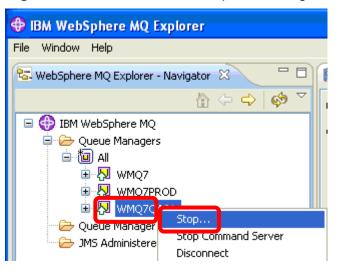
\_\_\_3. **Right-click** on the **PRODS.QMGRS** Set and select **Delete**.



\_\_4. Confirm the delete by clicking on the **Yes** button...



\_\_5. Right-click on the WMQ7QA01 queue manager and select Stop...



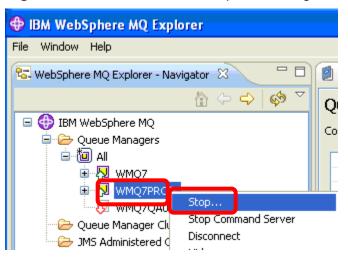
\_\_6. Select the Immediate radio button and click OK.

Stop Queue Manager - "WMQ7QA01"	
Choose Stop Method: Controlled Immediate	
0	

\_\_\_7. The following progress panel will appear...

Stopping Queue Ma	anager "WMQ7QA01"	
TAX	Executing WebSphere MQ Commands Please wait	
	Stopping Queue Manager	<
	<	
Show details		

\_\_8. Right-click on the WMQ7PROD queue manager and select Stop...



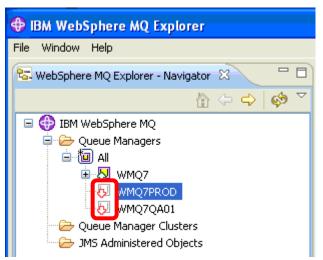
\_\_9. Select the **Immediate** radio button and click **OK**.

Stop Queue Manager - "WMQ7PROD"	
Choose Stop Method: Controlled Immediate	
0	OK Cancel

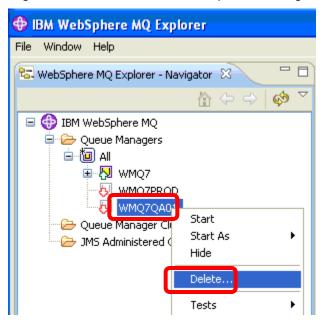
\_\_10. The following progress panel will appear...

Stopping Queue Ma	anager "WMQ7PROD"
TAX	Executing WebSphere MQ Commands Please wait
	Stopping Queue Manager
Indiana a su su su	
Show details	

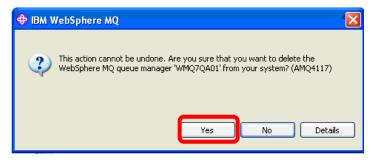
\_\_\_11. Now both queue managers should be stopped.



\_\_\_12. Right-click on the WMQ7QA01 queue manager and select Delete....



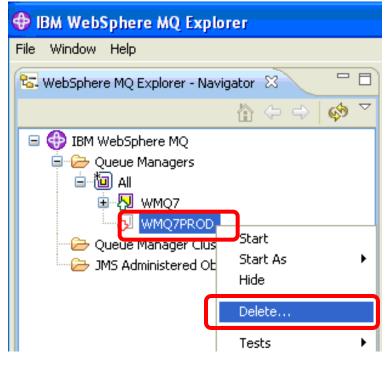
\_\_13. Confirm the delete by clicking the **Yes** button....



\_\_\_14. The following progress panel will be displayed....

Deleting Queue Ma	nager "WMQ7QA01"	
TAX	Executing WebSphere MQ Commands Please wait	
	Deleting Queue Manager	<
Show details	<u>&lt;</u>	>

\_\_15. Right-click on the WMQ7PROD queue manager and select Delete....



\_\_\_16. Confirm the delete by clicking the Yes button....

🗢 IBM WebSphere MQ 🛛 🗙
This action cannot be undone. Are you sure that you want to delete the WebSphere MQ queue manager "WMQ7PROD' from your system? (AMQ4117)
Yes No Details

\_\_\_17. The following progress panel will be displayed....

Deleting Queue Ma	nager "WMQ7PROD"	
The	Executing WebSphere MQ Commands Please wait	
	Deleting Queue Manager	<
Show details	<u>&lt;</u>	

\_\_18. You should now have just a single queue manager, WMQ7



This concludes Lab 1.

# Lab 2 Configuring the WebSphere MQ JMS Provider

The purpose of this lab is to demonstrate some of the typical steps you will go through when configuring WebSphere MQ as a JMS provider. Some of the tasks that you will perform include:

- Configure the Administered objects that a JMS program typically requires. Administered objects are used to externalize **Connection Factories** and **Destinations** from the program. This allows JMS Applications to be portable between Messaging Providers by shielding the applications from provider-specific details.
- Define a Java Naming and Directory Interface (JNDI) directory. In this lab you will perform the following:
  - Create a JNDI directory
  - Populate it with Connection Factory and Destination definitions
  - Use the MQ Explorer wizard to create corresponding MQ definitions
  - Run one of the Java<sup>™</sup> Message Service (JMS) sample programs from the command line to use those definitions to connect to MQ as a JMS provider and produce JMS messages
- \_\_\_1. If the MQ Explorer is not already running, you can launch it from the icon in the lower right hand corner of the screen that represents WebSphere MQ on this system.



\_\_\_\_2. Start the MQ Explorer by right-clicking on the icon and selecting **WebSphere MQ Explorer** 



## 2.1 Create Administered Objects using MQ Explorer

\_\_1. A directory has been created on your image called C:\JMS. This directory will hold the JNDI Namespace. When you create a connection to the namespace a file named .bindings will be created in this directory. \_\_\_2. Right-click on JMS Administered Objects in the Navigator pane, and select Add Initial Context...

🔀 IBM WebSphere MQ Explor	er
File Window Help	
😪 WebSphere MQ Explorer - Navig	ator 🛛
	$\triangleq \Leftrightarrow \Rightarrow   \bullet$
<ul> <li>□ IBM WebSphere MQ</li> <li>□ ▷ Queue Managers</li> <li>□ □ □ All</li> <li>□ □ □ □ WMQ7</li> <li>□ □ □ □ WMQ7</li> <li>□ □ □ □ Advanced</li> <li>□ □ □ □ Advanced</li> <li>□ □ □ □ Advanced</li> <li>□ □ □ □ Channe</li> <li>□ □ □ Channe</li> <li>□ □ □ □ Chann</li></ul>	els Connections rs s Definitions ts tication Information rs

\_\_3. On the **Connection details** screen, click on **File System**. Then click on **Browse** to navigate to the directory called **C:\JMS**. Click Next.

🕀 Add Initial Context		
Connection details		
Enter the location details of	the JNDI namespace.	
	e stored in Java Naming and Directory Interface (JNDI) namespace a JNDI namespace and is used to access the JMS objects that are si	
Where is the JNDI namespac	e located?	
OLDAP server		
File system     Other		
0.000		
JNDI Service Provider		
Factory class:	com.sun.jndi.fscontext.RefFSContextFactory	
JNDI Namespace Location Bindings directory:		Browse
Provider URL:	file:/C:/JMS/	browsen
Provider OKE.	netchood	
	< Back Next > Finish	Cancel

\_\_\_4. On the **'User preferences'** screen, enter the Context nickname **Context1**. Note this can be a name of your choice but for this lab you will use **Context1**. This name will not be used elsewhere. Check both the **Connect immediately on finish** and **Automatically reconnect to context on startup** checkboxes, and then click **Finish**.

🕀 Add Initial Context	
<b>User preferences</b> Configure user preferences for accessing the Initial Context.	
Context nickname: Context1  Connect immediately on finish Automatically reconnect to context on startup	
< <u>Back</u> <u>N</u> ext > <u>Finish</u>	Cancel

\_\_5. The newly created initial context is displayed in the list.

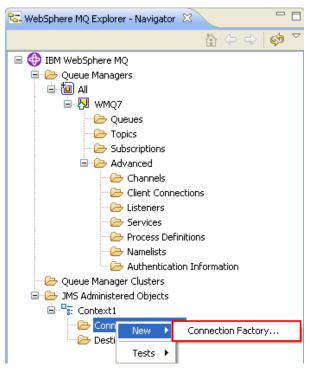
😪 WebSphere MQ Explorer - Navigator 🛛 📃 🗖	🗇 👩 WebSphere MQ Explorer - Content 🛛			
	JMS Administered Objects			
🖃 🌐 IBM WebSphere MQ				
🗐 🧀 Queue Managers	A Name	Status	Provider URL	Initial Context Factory
😑 🛅 All	Context1	Connected	file:/C:/JMS/	com.sun.jndi.fscontext.RefFSContextFactory
🖻 💹 WMQ7				
- 🗁 Queues				
🤁 Topics				
Advanced				
Channels				
Client Connections				
Services				
- Process Definitions				
- Amelists				
Authentication Information				
Queue Manager Clusters				
JMS Administered Objects				
E Context1				

This concludes this portion of Lab 2.

## 2.2 Create a connection factory for WebSphere MQ

A connection factory is the mechanism used by JMS to manage connections between your JMS application and the JMS Provider. You will now define a connection factory in the JNDI namespace.

\_\_1. Expand the context name you just created. Right-click **Connection Factories.** Select **New-> Connection Factory.** 



\_\_2. Enter the name CF1. Note this can be any name of your choice but for this lab you will use CF1. This will be required when running the program so you might want to make note of it. Accept WebSphere MQ as the messaging provider and then click Next >

New Connection Factory
Create a Connection Factory Enter the details of the connection factory
Name: CF1 Messaging provider:
WebSphere MQ Use WebSphere MQ as the messaging provider if the JMS client application uses point-to-point messaging or the WebSphere MQ Publich/Subscribe enrine

\_\_3. On the next screen, accept the Type as **Connection Factory** and leave **Support XA transactions** unchecked. Click on **Next** >.

New Connection Factory
Create a Connection Factory
Select the type of connection factory
Name:
CF1
Туре:
Connection Factory
Support XA transactions
This creates an object of type 'com.ibm.mq.jms.MQConnectionFactory'. Select this option if the JMS client application uses both point-to-point

\_\_\_4. On the next screen, accept **Bindings** as the Transport given we will run the JMS Application on the same machine as the Queue Manager. Click **Next** >.

Hew Connection Factory
Create a Connection Factory
Select the transport that the connections will use
Name:
CF1
Transport:
Bindings 🗸 🗸
This transport can be used only if the JMS application that uses the connection factory is on the same computer as the queue manager.
(?) < Back Next > Finish Cancel

\_\_5. On the next screen, leave 'Create with attributes like an existing connection factory' unchecked, and click **Next >**.

New Connection Factory	
Create a Connection Factory	
Enter the details of the object you wish to create	1
Name:	
CF1	
Create with attributes like an existing connection factory Select an existing object from which to copy the attributes for the new of	oject,
No system default object available, please select one	Select
	Cancel

\_\_\_6. This will open the **New Connection Factory** property sheet. Select **General** on the left hand menu. Use the Provider version **'7**'. This represents WebSphere MQ V7. Selecting this will enable JMS programs using this connection factory to utilize the new features of WebSphere MQ V7.

New Connection Factor	ory	
Change properties Change the properties of the	new Connection Factory	,
General - Connection - Broker - Temporary queues - Temporary topics - Subscriber - Extended - Advanced tuning	General Name: Description: Class name: Messaging provider: Transport: Provider version: Client identifier:	Bindings
0		< Back Next > Finish Cancel

\_\_\_7. Select **Connection** on the left hand menu. Click on the "**Select**" button for '**Base queue manager**'

New Connection Factory	/										
Change properties											
Change the properties of the new	w Connection Factory										
: General	Connection										_
Connection	Lonnection										
Broker	Base queue manager:								Select	t	
Temporary queues											
Temporary topics	Broker queue manager:								Select	t	
Subscriber Extended											
Advanced tuning	Connect options:	Standard								*	
Havancoa caning	Connection tag:	00000	00	00	00 0	00	00 1	00 0	0 00		
		00010	00					00 0			
		00020	00	00	00 (	00	00	00 O	0 000	.	
		00030	00	00	00 (	00	00	00 0	0 00	ı	
		00040	00					00 0			
		00050	00					00 0			
		00060 00070	00	00 00		00   00		00 0 00 0	0 00  0 00		
		00070	00	00	00 (	00	00 1	00 0	0 001		
					1					۳I	<b>~</b>
(?)				8.7			-				
<b>O</b>		< Back		Ne	ext >		F	Finish		lance	

\_\_8. Select the previously-defined Queue Manager **WMQ7** and then click "**OK**".

	ager			
Select the name of the queue manag	er to connect to.			
<ul> <li>Queue manager name</li> </ul>	Connection type	Connection name	Channel name	Channel definition table
💹 WMQ7	Local			
<				<u>&gt;</u>
Last updated: 10:48:05				
0				OK Cancel

\_\_9. Click **Finish** to create the connection factory.

New Connection Factory			×
Change properties Change the properties of the new C	onnection Factory		-
General Connection Broker Temporary queues Temporary topics Subscriber Extended Advanced tuning	Connection Base queue manager: Broker queue manager: Connect options: Connection tag:	WMQ7         Select           Select         Select           Standard         V	
0		< Back Next > Finish Cancel	

\_\_10. Click **OK** to dismiss the confirmation box



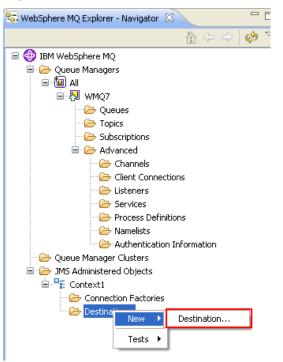
\_\_\_11. Observe that Connection Factory **CF1** now appears in the Content list.

🚸 IBM WebSphere MQ Explorer					
File Window Help					
🔁 WebSphere MQ Explor 🛛 🖓 🖓	🗐 WebSphere MQ E>	plorer - Conter	nt 🛛	석티	🤣 🗸 🗖 🗍
	Connection F	actories			
□ ③ IBM WebSphere MQ	Filter: Default for 3	IMS Connection	n Factory		•
□ → JMS Administered Objects	🛆 Name	Description	Class name	Messaging provider	Transport
Gontext1	liticF1		MQConnectionFactory	WebSphere MQ	Bindings :
Destinations					
					>
	Scheme: Default fo	or JMS Connect	ion Factory		•
<	Last updated: 14:2	9:04			
	,				

This concludes this portion of Lab 2.

# 2.3 Create a Destination for the JMS Application to put a message to.

\_\_1. Right-click 'Destinations' and click New  $\rightarrow$  Destination...



\_\_\_2. Enter the name **JMS1**. Note this can be any name of your choice but for this lab you will use **JMS1**. Leave the Type as '**Queue**' and ensure '**Start wizard to create a matching MQ Queue**' is checked. This will create a corresponding WebSphere MQ Queue. The Queue that you create will be used to verify that messages are successfully written using the sample program. Click **Next >**.

New Destination
Create a Destination
Enter the details of the object you wish to create
Name:
JM51
Messaging provider:
WebSphere MQ and Real-time
A destination that is created in WebSphere MQ Explorer can be used with both WebSphere MQ and Real-time messaging providers.
Туре:
Queue
Select this option if the JMS application uses point-to-point messaging. The destination will represent a queue.
When this wizard completes, another wizard can be started automatically to create a matching object.
Cancel

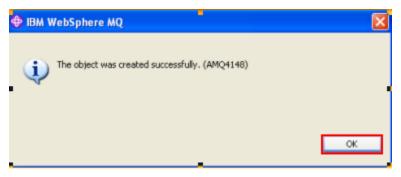
\_\_3. Accept the defaults on this next screen and click Next >.

New Destination	
Create a Destination	
Enter the details of the object you wish to create	
Name:	
JM51	
Create with attributes like an existing destination	
Select an existing object from which to copy the attributes for the new object.	
No system default object available, please select one	Select
C Back Next > Finish	Cancel

\_\_4. On the change properties screen you can set some MQ-specific properties of the destination. Select WMQ7 as the Queue Manager and define a Queue with the same name as the JMS Destination. Note the Queue name can be any name of your choice but for this lab you will use JMS1. This will be created as part of the upcoming wizard. Click Finish to launch the MQ configuration wizard.

New Destination			
Change properties Change the properties of the ne	w Destination		
General Message handling Producers Consumers Extended	General Name: Description: Class name: Messaging provider: Queue manager: Queue:	JM51 MQQueue WebSphere MQ and Real-time WMQ7 JM51	Select
0		< Back Next > Finish	Cancel

\_\_5. Click **OK** to dismiss the confirmation screen.



\_\_6. The Create an MQ Queue wizard will start automatically. Click Next >.

🕀 Create an MQ Queue	×
New Queue Choose the Queue Manager in which to create the new Queue	-
[This wizard creates a new MQ queue for use with the existing JMS queue 'JMS1'.         Any relevant properties from the JMS queue are mapped to the new MQ queue, including the name of the new MQ queue 'JMS1'. If you change the properties of the JMS queue in future, the changes are not inherited by the MQ queue.         Select the queue manager on which you want to create the new MQ queue.         Queue Manager:         WMQ7         Select         To view the new MQ queue, click the Queues folder of the queue manager on which the MQ queue has been created.	
Cancel           Cancel	

\_\_\_7. Accept the default 'Local Queue' for Type and then click Next >

💠 Create an MQ Queue	_ 🗆 🔀
New Queue Choose the type of Queue to create	
Name: JMS1	
Type: Local Queue A local queue is a definition of both a queue and the set of messages that are associated the queue. The queue manager that hosts the queue receives messages in its local queu	✓ d with Jes.
C Back Next > Finish	Cancel

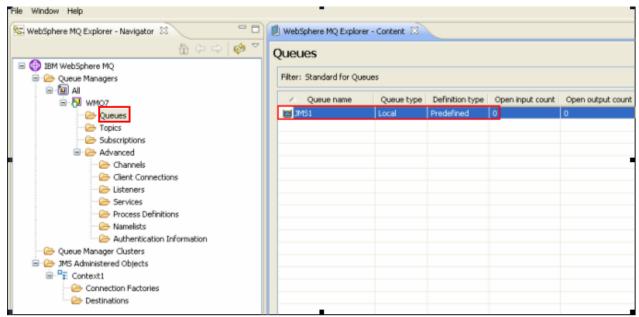
\_\_\_8. Click **Finish** to create the MQ queue.

🕀 Create an MQ Que	•
Create a Local Queu	
Enter the details of the ol	ect you wish to create
Name:	
JMS1	
Select an existing object f	m which to copy the attributes for the new object.
SYSTEM.DEFAULT.LOCA	.QUEUE Select
SYSTEM.DEFAULT.LOCA	()
The following property val	es override the property values in the like object:
The following property val Attribute	es override the property values in the like object: Value
The following property val	es override the property values in the like object:
The following property val Attribute Queue name	es override the property values in the like object: Value JMS1
The following property val Attribute Queue name	es override the property values in the like object: Value JMS1
The following property val Attribute Queue name	es override the property values in the like object: Value JMS1
The following property val Attribute Queue name	es override the property values in the like object: Value JMS1
The following property val Attribute Queue name	es override the property values in the like object: Value JMS1

\_\_9. Click **OK** to close the confirmation prompt.

🕀 IBM WebSphere MQ	
The object was created successfully. (AMQ4148)	
	ок

\_\_\_10. Click on the Queues folder under WMQ7 in the MQ Explorer Navigator pane, and look at the Content pane to confirm that an MQ local queue called **JMS1** has been created.



This concludes this portion of Lab 2.

#### 2.4 Writing a JMS message using a Java sample program

Some very good code samples ship with WebSphere MQ V7 and you will use one of them to create a JMS message on an MQ JMS queue.

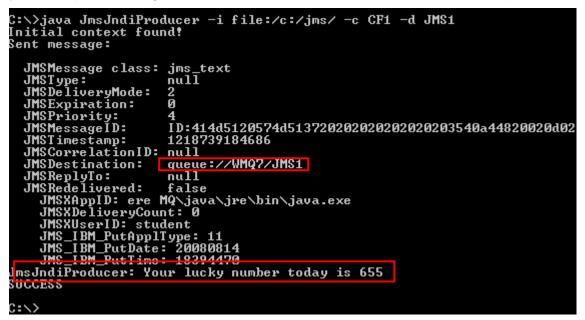
\_\_\_1. Open a command prompt. A shortcut for this is in the start menu.



\_\_\_2. Type in the following command:

#### java JmsJndiProducer -i file:/c:/jms/ -c CF1 -d JMS1

This will run the Java JMS sample program JmsJndiProducer. The "-i" argument points the program to the location of your JNDI directory. The "-c CF1" identifies the connection factory for your test queue manager, and the "-d JMS1" identifies the JMS destination queue.



Having run this program, you should now have a message in the **JMS1** queue. To see whether you do, you can look for the message that was produced by this program using the WebSphere MQ Explorer. Switch back to the MQ Explorer window

\_\_\_3. In the MQ Explorer Navigator pane, locate the folder called **JMS Administered Objects**. Click on the **Destinations** folder beneath it, and in the Content pane you should see your JMS Destination **JMS1**. Double-click on the JMS1 destination to find the MQ Queue that is associated with it.

🕀 IBM WebSphere MQ Explorer	
File Window Help	
🔁 WebSphere MQ Explorer - 🛛 🗖 🗖	🗐 WebSphere MQ Explorer - Content 🛛
	Destinations
🖃 🌐 IBM WebSphere MQ	
🗐 🧀 Queue Managers	Filter: Default for JMS Destination
🖻 🖓 WMQ7	A Name Description Class name
- 🗁 Queues	
Topics	JMS1 MQQueue
- 🧀 Subscriptions	
🗄 🗁 Advanced	
🗁 🗁 Queue Manager Clusters	
🖮 🧁 JMS Administered Objects	
🖮 📲 Context1	
- Connection Factories	
Destinations	

\_\_\_4. Recall that MQ queue **JMS1** is associated with the JMS destination **JMS1**. Click on **Cancel**.

General General General	
Producers Name: JM51	
Consumers Extended	
Class name: MQQueue	
Messaging provider: WebSphere MQ and Real-time	
Queue manager: WMQ7 Selem	:t
Queue: JMS1 Seler	:t
Apply	
ОК         Саг	cel

\_\_5. Right-click on the JMS1 MQ queue object and then select **Browse Messages...** 

\ominus IBM WebSphere MQ Explore	r	
File Window Help		
🔁 WebSphere MQ 🛛 🗖	🗐 WebSphere MQ Explorer	r-Content 🕱
$\land \Leftrightarrow \Rightarrow \diamond \nabla$	Queues	
🖃 🌐 IBM WebSphere MQ		
Queue Managers	Filter: Default for Queue	·S
	🛆 Queue name	Queue type Definition type Or
	DMS1	Compare with
- Copics - Copics - Copics		Status
🗄 🗁 Advanced		Delete
Queue Manager Cluster		Clear Messages
ia - □ - □ - □ - □ - □ - □ - □ - □ - □ -		Put Test Message
Connection Facl		Browse Messages Create JMS Queue
Destinations		Object Authorities
		Properties
	Scheme: Default for Que	ues - Distributed

\_\_\_6. The message data column in the display should match the message text that you wrote with the JmsJndiProducer program.

🛛 M	essage browser							
	eue Manager Name: eue Name:	WMQ7 JM51						
	<ul> <li>Position</li> </ul>	Put date/time	User identifier	Put application name	Format	Data length	Message data	Accounti
	1	Aug 14, 2008 1:39:44 PM	student	ere MQ\java\jre\bin\java.exe	MQSTR	199	JmsJndiProducer: Your lucky number today is 65	5 16010515
_								
								>
9	cheme: Default for I	Messages						$\bigtriangledown$
L	ast updated: 13:43::	-						
6			en browsed. Pres	ss the refresh button for new m	essages.			
							Refr	esh Close

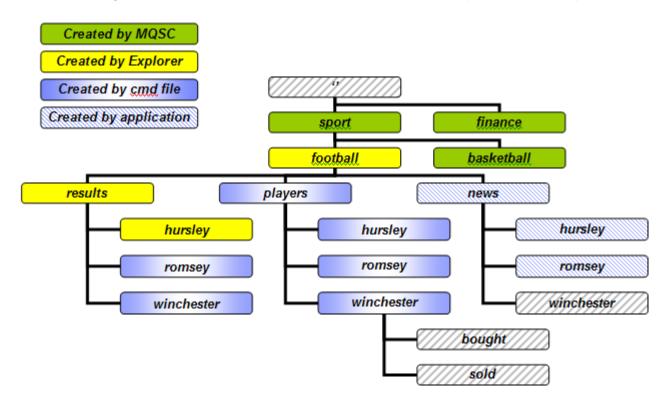
This concludes Lab 2.

## Lab 3 Publish / Subscribe Administration Lab

#### 3.1 Lab Overview

This lab will demonstrate the administration of Publish / Subscribe-related objects using the WebSphere MQ Explorer. Also, you will use the MQ Explorer Test Publication and Test Subscription features to demonstrate publishing and subscribing to TOPIC strings.

You will be working with the hierarchical structure of TOPIC STRINGS represented in the picture below.



## 3.2 Using MQ Explorer to create and display information

\_\_\_1. If the MQ Explorer is not already running, you can launch it from the icon in the lower right hand corner of the screen that represents WebSphere MQ on this system.



\_\_\_\_2. Start the MQ Explorer by right-clicking on the icon and selecting **WebSphere MQ Explorer** 



\_3. Click on the **Topics** folder in the Navigator pane (left side). Notice that you have no topic objects defined yet! We have provided a script for this purpose.

\ominus IBM WebSphere MQ Explore	r			
File Window Help				
🔁 WebSphere MQ 🛛 🗖	🗐 WebSphe	re MQ Explorer	- Content 🛛	3
IBM WebSphere MQ	Topics			
Queue Managers	Filter: Def	ault for Topics		
iania Ali iani Manazaria	🛆 Toj	pic name	Topic type	Topic string
Queues				
🗁 🗁 Queue Manager Cluster				
Connection Fac				
🗁 Destinations				

\_\_4. To run the provided script, find the shortcut called PubSub Lab Setup on the Windows<sup>®</sup> desktop. Double-click the shortcut to run the script.



\_\_5. The script should run very quickly, leaving the following command window open. Verify that the command was successful. Then press Enter to close the command window.

: SUB <asparent></asparent>
AMQ8690: WebSphere MQ topic created.
7 : DEFINE TOPIC(SPORT.FOOTBALL.NEWS) +
: TOPICSTR('sport/football/news') +
: REPLACE +
: PUB(ENABLED) +
: SUB(ENABLED)
AMQ8690: WebSphere MQ topic created.
7 MQSC commands read.
No commands have a syntax error.
All valid MQSC commands were processed.
C:\Student\Lab_PubSubAdmin\resources>pause
Press any key to continue

\_\_\_6. You should now see the following WebSphere MQ Topic objects displayed in the Content pane in the MQ Explorer. Observe the Topic <u>objects</u> (under the Topic name column) and their corresponding Topic <u>string</u> values. Also observe the Publish and Subscribe enablement status on the right.

opics					
Filter: Default for Topics					
△ Topic name	Topic type	Topic string	De	Publish	Subscrib
BIFINANCE	Local	finance		Inhibited	Inhibited
E SPORT	Local	sport		Inhibited	As parer
SPORT.BASKETBALL	Local	sport/basketball		As parent	As parer
SPORT.FOOTBALL	Local	sport/football		Inhibited	As parer
SPORT.FOOTBALL.NEWS	Local	sport/football/news		Allowed	Allowed
SPORT.FOOTBALL.PLAYERS	Local	sport/football/players		Allowed	Allowed
SPORT.FOOTBALL.PLAYERS.HURSLEY	Local	sport/football/players/hursley		As parent	As parer
SPORT.FOOTBALL.PLAYERS.ROMSEY	Local	sport/football/players/romsey		As parent	As parer
SPORT.FOOTBALL.PLAYERS.WINCHESTER	Local	sport/football/players/winches	ster	As parent	As parer
SPORT.FOOTBALL.RESULTS	Local	sport/football/results		Inhibited	As parer
SPORT.FOOTBALL.RESULTS.HURSLEY	Local	sport/football/results/hursley		Allowed	Allowed
SPORT.FOOTBALL.RESULTS.ROMSEY	Local	sport/football/results/romsey		Allowed	Allowed
SPORT.FOOTBALL.RESULTS.WINCHESTER	Local	sport/football/results/winches	ter	Allowed	Allowed

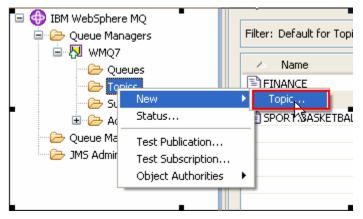
\_\_\_7. Double-Click on the **SPORT** Topic object.

□ ⊕ IBM WebSphere MQ □ ⊕ ⊖ Queue Managers □ - ₩ WMQ7	Filter: Default for Topics				
	🛆 Name	Topic String	Description	Publish	Subscrib
	FINANCE	finance		Inhibited	Inhibited
	SPORT	sport		Inhibited	As paren
🗄 🗁 Advanced	SPORT.BASKETBALL	sport/basketball		As parent	As parer
🗁 🗁 Queue Manager Clusters					
🧀 JMS Administered Objects					

\_\_\_8. Observe the various properties of the Topic object. Explore the various values available on the pull-downs if you wish. Close the window by clicking "**Cancel**".

🖹 SPORT - Properties			×
General	General		
Distributed Publish/Subscribe	Topic name:	SPORT	
Statistics	Topic type:	Local	
	Topic string:	sport	
	Description:		
	Publish:	Inhibited	
	Subscribe:	As parent	
	Durable subscriptions:	As parent	
	Default priority:	As parent	
	Derauk prioricy:		
	Default persistence:	As parent	
	Model durable queue:	Select	
	Model non-durable queue:	Select	
	Default put response type:	As parent	
	Non-persistent message delivery:	As parent	
	Persistent message delivery:	As parent	
	Wildcard operation:	Passthrough	
		Apply	
0		OK Cancel	כ

\_\_\_9. From the Navigation pane select "**Topics**" under queue manager WMQ7. Right-click on **Topics** and then select **New→Topic** from the context menu.



\_\_10. Enter MONEY in the Name field; allow the other fields to default. Then click "Next".

Create a Topic Enter the details of the object you wish to create	1
Name: MONEY	
Select an existing object from which to copy the attributes for the new object. SYSTEM.DEFAULT.TOPIC	Select
When this wizard completes, another wizard can be started automatically to create a matching object. Start wizard to create a matching JMS Topic	
< Back Next > Finish	Cancel

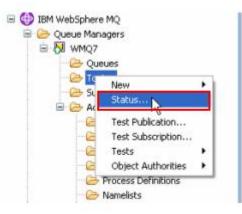
\_\_\_11. Enter **"finance/cash/gettingit/frombanks**" (without the quote marks) in the **Topic string** field. Enter a description in the description field and then click "**Finish**"

New Topic			
Change properties Change the properties of the new T	opic		
General Distributed Publish/Subscribe	General	[	
Cluster	Topic name: Topic string:	MONEY finance/cash/gettingit/frombanks	٥Ĭ
	Description:	test to show implicit nodes created in Topic String	
	Publish:	As parent	×
	Subscribe:	As parent	~
	Durable subscriptions: Default priority:	As parent  As parent	>
		0	
0		< Back Next > Einish	Cancel

\_\_\_12. Close the confirmation box by clicking "**OK**".



\_\_13. Back in the MQ Explorer, right click on "Topics" (under WMQ7) and then select "Status".



14. Now click on the "+" symbol to the left of "finance" – a level of the hierarchy opens; repeat on the "+" in front of "cash", then "gettingit", then "frombanks" which is the bottom of the "tree".

In the Topic Status notice that all the intermediate nodes have been created and that they have inherited properties from the parent "**finance**". These intermediate nodes have no related Topic Objects and so cannot have their properties altered by MQSC or MQ Explorer.

\_\_\_15. Close the Topic Status view by clicking on "Close".

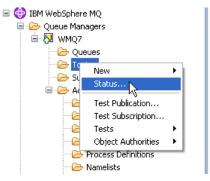
pic status:						
Topic string	Publish	Subscribe	Durable subscriptions	Default priority	Default persistence	Model durable qu
	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE
Finance	Inhibited	Inhibited	Allowed	0	Not persistent	SYSTEM.DURABLE
cash	Inhibited	Inhibited	Allowed	0	Not persistent	SYSTEM.DURABLE
gettingit	Inhibited	Inhibited	Allowed	0	Not persistent	SYSTEM.DURABLE
frombanks	Inhibited	Inhibited	Allowed	0	Not persistent	SYSTEM.DURABLE
sport     sport	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABL
<	> <					>
Scheme: Default for Topic Statu						
Scheme, Deradicron Topic Scata	s - Discribacea					

This concludes this portion of Lab 3.

### 3.3 A First look at the MQ Explorer Pub / Sub Test tools

In this section you will be using the tools that come with WebSphere MQ Explorer that allow you to test publishing to and subscribing to topics.

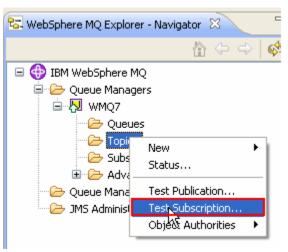
\_\_\_1. You will now be working with some pre-defined topics. From the WebSphere MQ Explorer, display topic status by right-clicking on the **Topics** folder and selecting **Status...** 



\_\_2. You are going to focus on the "sport" topic tree. Expand the "+" symbols on the sport topic tree and you should see something similar to the screen capture below. Notice that Publish is <u>allowed</u> for the topic string 'sport/football/results/hursley'. Also, following the tree "up", you should notice that the topic string "sport/football" has the publish attribute "Inhibited". <u>Remember this</u> as you complete the next steps of this lab. Click Close to dismiss the status window.

durable queu M.DURABLE.M		Default persistence	Default priority	Durable subscriptions	Subscribe	Publish		Topic string
			0	Allowed	Allowed	Allowed		
		Not persistent Not persistent	0	Allowed		Inhibited		
M.DURABLE.M M.DURABLE.M		Not persistent	0	Allowed	Allowed	Allowed		
M.DURABLE.M		Not persistent	0	Allowed	Allowed	Allowed	athall	⊟ sport
M.DURABLE.M		Not persistent	0	Allowed		Inhibited		E foott
M.DURABLE.M		Not persistent	0	Allowed	Allowed	Allowed	iews	
M.DURABLE.M		Not persistent	0	Allowed	Allowed	Allowed	layers	_
M.DURABLE.M			•			raterieu		
M.DURABLE.M		Not persistent	0	Allowed	Allowed	Allowed	hursley	
M.DURABLE.M	SY:	Not persistent	0	Allowed	Allowed	Allowed	± romsey	
M.DURABLE.M	SYS	Not persistent	0	Allowed	Allowed	Allowed	winchester	
>						<		<
	SYS SYS	Not persistent Not persistent Not persistent	0	Allowed	Allowed Allowed Allowed	Allowed	esults hursley ± romsey ≆ winchester	1

\_\_3. Start a test subscription window by right-clicking on Topics and selecting "Test Subscription".



\_4. Type in the topic string "**sport/football/#**" and press the "**Subscribe**" button.

The "#" symbol is called the *multi-level wildcard*. The string "**sport/football/#**" indicates a subscription to all publications sent to the sport/football topic or any of its children. The Test Tool window remains open and the "**Unsubscribe**" button becomes active. Publications received will be displayed in the "**Messages received**" box.

🖹 Subscribe 📃 🗖 🗙
Subscribe to:
Queue Manager:
WMQ7
Topic String:
sport/football/#
Wildcard Usage:
Topic Level Wildcard
Subscribe Unsubscribe
Messages received:

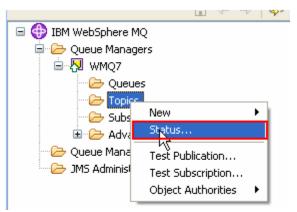
\_\_5. Minimize the Subscribe window by clicking on the minimize button.



\_6. The Subscribe window will "park" itself at the bottom left part of the Windows desktop. You will restore this window in a later step of this lab.



\_\_\_7. Right click on the Topics folder then select Status...



\_\_8. Expand the **sport** tree. Observe the Subscription counts; sport/football and its children have a positive subscription count. Close the topic status window.

Publish	Subscribe	Durable s	D	Default put	Admin topic name	Sub count
Allowed A	Allowed	Allowed	0	Synchronous	SYSTEM.BASE.TOPIC	0
Inhibited I	Inhibited	Allowed	0	Synchronous	FINANCE	0
Inhibited A	Allowed	Allowed	0	Synchronous	SPORT	0
Inhibited A	Allowed	Allowed	0	Synchronous	SPORT.BASKETBALL	0
Inhibited A	Allowed	Allowed	0	Synchronous	SPORT.FOOTBALL	1
Allowed A	Allowed	Allowed	0	Synchronous	SPORT.FOOTBALL.NEWS	1
Allowed A	Allowed	Allowed	0	Synchronous	SPORT.FOOTBALL.PLAYERS	1
Inhibited A	Allowed	Allowed	0	Synchronous	SPORT.FOOTBALL.RESULTS	1
<						
						~
	Allowed Inhibited Inhibited Inhibited Allowed Inhibited	AllowedAllowedInhibitedInhibitedInhibitedAllowedInhibitedAllowedInhibitedAllowedAllowedAllowedInhibitedAllowedInhibitedAllowed	Allowed         Allowed         Allowed           Inhibited         Inhibited         Allowed         Inhibited           Inhibited         Allowed         Allowed         Allowed           Inhibited         Allowed         Allowed         Allowed           Inhibited         Allowed         Allowed         Allowed           Inhibited         Allowed         Allowed         Allowed           Allowed         Allowed         Allowed         Allowed           Allowed         Allowed         Allowed         Allowed           Inhibited         Allowed         Allowed         Allowed	Allowed         Allowed         O           Inhibited         Inhibited         Allowed         O           Inhibited         Allowed         Allowed         O           Inhibited         Allowed         Allowed         O           Inhibited         Allowed         Allowed         O           Inhibited         Allowed         Allowed         O           Allowed         Allowed         Allowed         O           Allowed         Allowed         Allowed         O           Allowed         Allowed         Allowed         O           Allowed         Allowed         Allowed         O           Inhibited         Allowed         Allowed         O	Allowed         Allowed         Allowed         0         Synchronous           Inhibited         Inhibited         Allowed         0         Synchronous           Inhibited         Allowed         0         Synchronous           Inhibited         Allowed         0         Synchronous           Inhibited         Allowed         0         Synchronous           Inhibited         Allowed         Allowed         0         Synchronous           Inhibited         Allowed         Allowed         0         Synchronous           Allowed         Allowed         0         Synchronous           Allowed         Allowed         0         Synchronous           Inhibited         Allowed         Allowed         0         Synchronous           Inhibited         Allowed         Allowed         0         Synchronous	Allowed         Allowed         Allowed         0         Synchronous         SYSTEM.BASE.TOPIC           Inhibited         Inhibited         Allowed         0         Synchronous         FINANCE           Inhibited         Allowed         0         Synchronous         SPORT           Inhibited         Allowed         0         Synchronous         SPORT           Inhibited         Allowed         0         Synchronous         SPORT.BASKETBALL           Inhibited         Allowed         0         Synchronous         SPORT.FOOTBALL           Allowed         Allowed         0         Synchronous         SPORT.FOOTBALL.NEWS           Allowed         Allowed         0         Synchronous         SPORT.FOOTBALL.NEWS           Allowed         Allowed         0         Synchronous         SPORT.FOOTBALL.PLAYERS           Inhibited         Allowed         0         Synchronous         SPORT.FOOTBALL.RESULTS

\_\_\_9. From the Topic display, select the "SPORT.FOOTBALL" row, right-click and select "Topic Status – Subscribers". This gives detailed information about subscribers to this Topic object.

ilter: Default for Topics					•
<ul> <li>Name</li> </ul>	Topic String	Description	Publish	Subscribe	
FINANCE	finance		Inhibited	Inhibited	
MONEY	finance/cash/gettingit/frombanks	Test to show implici	As parent	As parent	
SPORT	sport		Inhibited	As parent	
SPORT.BASKETBALL	sport/basketball		As parent	As parent	
SPORT.FOOTBALL	Compare with		Inhibited	As parent	
SPORT.FOOTBALL.NEWS			Allowed	Allowed	
SPORT.FOOTBALL.PLAYERS	Status		Allowed	Allowed	
SPORT.FOOTBALL.PLAYERS.HURSLEY	Delete		As parent	As parent	
SPORT.FOOTBALL.PLAYERS.ROMSEY	Clear Retained Publication		As parent	As parent	
SPORT.FOOTBALL.PLAYERS.WINCHESTER	Topic Status - Subscribers		As parent	As parent	
SPORT.FOOTBALL.RESULTS	Topic Status - Publishers		Inhibited	As parent	
SPORT.FOOTBALL.RESULTS.HURSLEY	Test Publication		Allowed	As parent	
SPORT.FOOTBALL.RESULTS.ROMSEY	Test Subscription		Allowed	Allowed	
SPORT.FOOTBALL.RESULTS.WINCHESTER	Create JMS Topic		Allowed	Allowed	
	Object Authorities				
	Properties				

\_\_\_10. Observe the detailed display and then close the status screen by clicking on the "Close" button.

ue Manager: WMQ7					Topic Name: SPORT	FOOTRALL		
					Topic mane: Show	POOTDALL		
ic status - subscriber	s for the topic "SPO	RT.FOOTB	ALL":					
ilter: Default for Top	c Status - Subscrib	er						
/ Topic String	Identifier	User	Durable	Туре	Connection ID	Resume date	Resume time	Message count
sport/football	4140512	student	No	API	0AC9AD46200	06-Oct-2007	15:38:11	0
cheme: Default for T	ania Chabur - Cabas	ulture - Dista	the stand					
	-	nuer • uson	buced					
ast updated: 15:56:4	4							

\_\_\_11. Now you will <u>publish</u> a message. Returning to the Topic list, select the **SPORT.FOOTBALL** row, right-click and then select "**Test Publication**".

opics			
Filter: Default	for Topics		
Name		Topic String	
FINANCE		finance	
MONEY		finance/cash/gettingit/frombanks	1
SPORT		sport	
SPORT.BA	SKETBALL	sport/basketball	
SPORT.F	Compare with	sport/footbal sport/footbal/news	
SPORT.F	Status	sport/footbal/players	
SPORT.F	Delete	sport/football/players/hursley	
SPORT.F	Clear Retained Publication	sport/football/players/romsey	
SPORT.F	Topic Status - Subscribers	sport/football/players/winchester	
SPORT.F	Topic Status - Publishers	sport/football/results	
SPORT.F	Test Publication	sport/football/results/hursley	
SPORT.F	Test Subscription	sport/football/results/romsey	
SPORT.F	Create JMS Topic	sport/football/results/winchester	
	Object Authorities	•	
	Properties	-	
	Properties		

\_\_\_12. This dialog will publish a message to the topic string "**sport/football**".

🖹 Publish Test Message	
Publish message to:	
Queue Manager:	
WMQ7	
Topic String:	
sport/football	
Message data:	
Retained message	
Publishing a retained message could overwrite an existing retained publishing a retained message could overwrite an existing retained publishing a retained message could overwrite an existing retained publishing a retained message could overwrite an existing retained publishing a retained message could overwrite an existing retained publishing a retained message could overwrite an existing retained publishing a retained message could overwrite an existing retained publishing a retained publishing a retained message could overwrite an existing retained publishing a retained message could overwrite an existing retained publishing a retained publishing a retained publishing a retained message could overwrite an existing retained publishing a retained publishin	lication
Publish message	Close

\_\_\_13. Before entering a message and sending it you will arrange the windows on the screen.

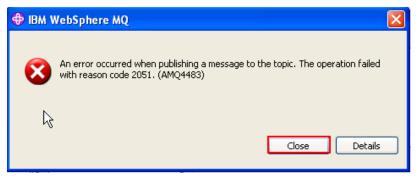
\_\_14. Locate the "Subscribe" Test Tool window where you previously subscribed to "sport/football/#". Click on the Restore window button to restore the window. Now position the Publish Test Message and the restored Subscribe test tool windows so they both are visible. Then return focus to the Publish window.



- \_\_\_15. Type a message such as "Hello World" and then press "Publish Message".
- \_\_\_16. An error occurs because the topic object for "**sport/football**" is **publish-inhibited**; you'll recall that we saw that this was set earlier in the lab. But this will not inhibit our subscribers; we used the multi-level wildcard to subscribe to topics at and below "sport/football" in the topic tree, so we will be subscribing to items published lower in the hierarchy.

Þ.	Rid WahSphara MO Explorer				S
File	🖹 Publish Test Message		🖹 Subscribe		
ę	Publish message to:		Subscribe to:		<b>4</b> 1   66
	Queue Manager:		Queue Manager:		
Т	WMQ7		WMQ7		
	Topic String:		Topic String:		
	sport/football		sport/football/#		Subs
			Wildcard Usage:		Inhibi
	Message data:		Topic Level Wildcard	~	: As pa
	Hello Worls				As pa
	Retained message		Subscribe Unsubscribe		: As pa
					As pa
	<ol> <li>Publishing a retained message could overwrite an exist</li> </ol>		Messages received:		Allow
		IR IR			Allow
					: Aspa : Aspa
		TR I I			: As pa
	Publish n	nessage Close T			As pa
		K I		~	As pa
		SPORT.FOOTBALL.RESULT		>	Allow
		SPORT.FOOTBALL.RESULT	Clear		Allow
			Last subscribed at 15:38:11		
			Last subscribed at 15:56:11		
		<		Close	
		Scheme: Default for Topics - D			
		· · · · · · · · · · · · · · · · · · ·			

\_\_\_17. Click on Close to dismiss the error popup.



\_\_\_18. In the Publish Test Message window, overtype the topic string to "**sport/football/news/hursley**" and click on **Publish Message**. You have published and subscribed your first message!

Note: these dynamically created Topic objects are temporary and only exist for a limited amount of time before the queue manager removes them; for example if you restart the Queue Manager, they will no longer exist

Publish Test Message		Н	Subscribe	_ 🗆 🛛
Publish message to:		Н	Subscribe to:	
Queue Manager:		н	Queue Manager:	
WMQ7		Ш	WMQ7	
TOPIC Sering:		Н	Topic String:	
sport/football/news/hursley		H	sport/footbal/#	
shord-comparisonalises		Н	Wildcard Usage:	
Message data:		н	Topic Level Wildcard	~
Hello World		н		
Retained message			Subscribe	
Publishing a retained message could overwrit	e an existing retained publication	Н	Messages received:	
Pausing a recaries message could over with	ie all existing recailed publication	RS		
		985 985		
	Publish message Close	RS TS		
		T		~
	SPORT.FOOTBALL.RES		<	2
	SPORT.FOOTBALL.RES	ULTS	Clear	
		-		
			Last subscribed at 15:38:11	
	<			Close
5 B			🖹 Subscribe	_ C >
Publish Test Message		1		
			Substribe to:	
Publish message to:				
Publish message to: Queue Manager:			Subscribe to:	
Publish message to: Queue Manager: WMQ7		•	Subscribe to: Queue Manager:	
Publish message to: Queue Manager: WMQ7 Topic String:			Subscribe to: Queue Manager: WMQ7	
Publish message to: Queue Manager: WMQ7			Subscribe to: Queue Manager: WMQ7 Topic String:	
Publish message to: Queue Manager: WMQ7 Topic String:			Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/#	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley			Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data:			Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage:	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Helio World Retained message			Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Helio World			Subsorbe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subsorbe Unsubsorbe Messages received:	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Helio World Retained message		ern RS RS	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe Messages received: Time: 20:22:38 Topic String: sport/football/news/hursley	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Helio World Retained message		on RS RS	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe Messages received: Time: 20:22:38 Topic String: sport/football/news/hursley Message: Hello World	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Hello World Retained message ① Publishing a retained message could overwrite	te an existing retained publication	971 972 973 973 973 973 973 973 973 973 973 973	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe Messages received: Time: 20:22:38 Topic String: sport/football/news/hursley Message: Hello World	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Hello World Retained message ① Publishing a retained message could overwrite		on RS RS	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe Messages received: Time: 20:22:38 Topic String: sport/football/news/hursley Message: Hello World	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Hello World Retained message ① Publishing a retained message could overwrite	te an existing retained publication	500 502 502 502 502 502 502 502 502 502	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe Messages received: Time: 20:22:38 Topic String: sport/football/news/hursley Message: Hello World	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Hello World Retained message ① Publishing a retained message could overwrite	te an existing retained publication	GRS GRS GRS GRS GRS GRS GRS GRS GRS GRS	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe Messages received: Time: 20:22:38 Topic String: sport/football/news/hursley Message: Helio World	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Hello World Retained message ① Publishing a retained message could overwrite	te an existing retained publication          Publish message       Close         Image: Close       Close	GRS GRS GRS GRS GRS GRS GRS GRS GRS GRS	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe Messages received: Time: 20:22:38 Topic String: sport/football/news/hursley Message: Hello World	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Hello World Retained message ① Publishing a retained message could overwrite	te an existing retained publication          Publish message       Close         Image: Close       Close	GRS GRS GRS GRS GRS GRS GRS GRS GRS GRS	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe Messages received: Time: 20:22:38 Topic String: sport/football/news/hursley Message: Hello World 	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Hello World Retained message ① Publishing a retained message could overwrite	te an existing retained publication          Publish message       Close         Image: Close       Close	GRS GRS GRS GRS GRS GRS GRS GRS GRS GRS	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe Messages received: Time: 20:22:38 Topic String: sport/football/news/hursley Message: Helio World	
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/news/hursley Message data: Hello World Retained message ① Publishing a retained message could overwrite	te an existing retained publication          Publish message       Close         Image: Close       Close	GRS GRS GRS GRS GRS GRS GRS GRS GRS GRS	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subscribe Unsubscribe Messages received: Time: 20:22:38 Topic String: sport/football/news/hursley Message: Hello World 	

\_\_\_19. Now try publishing to "sport/football/news/hursley/fundraising/raffle". The message is sent to the subscriber. New levels of the hierarchy have been created automatically.

🖻 Publish Test Message		Subscribe	×
Publish message to:         Queue Manager:         WMQ2         Topic Skring:         sport/football/news/hursley/fundraising/raffle         Message data:         Helo New Topic String         Retained message         Image: Publishing a retained message could overwrite an existing retained publication         Lest published at 20:27:09		Subsorbe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard Subsorbe Unsubsoribe Messages received: Time: 20:23:27 Topic String: sport/football/news/hursley Message: Helio World Time: 20:27:09	×
Publish message Core	RESULTS	Topic String: sport/football/news/hursley/fundraising/rafile Message: Hello New Topic String Clear Last subscribed at 15:38:11	Cose

\_\_20. Now try publishing to "sport/football/rules/offside". The publish attempt failed! That is because the node in the topic tree that is dynamically created automatically inherits the properties of the parent "**sport/football**" – which has its Publish attribute Inhibited. Click on **Close** to close the error popup.

🖻 Publish Test Message 📃 🗖 🗙	🖹 Subscribe
Publish message to: Queue Manager: WMQ7 Topic String: sport/football/rules/offside Message data:	Subscribe to: Queue Manager: WMQ7 Topic String: sport/football/# Wildcard Usage: Topic Level Wildcard
Hello New Topic String	Subscribe Unsubscribe
Retained message     BM WebSphere MQ	
Publishing a retained message could overwrite      An error occurred when public with reason code 2051. (AMO	shing a message to the topic. The operation failed 24483)
	Close Detais

\_\_21. Return to the Topic object display. Once again open the Topic status list and expand the sport hierarchy. You will see the automatically created elements. Click on Close to close the status window.

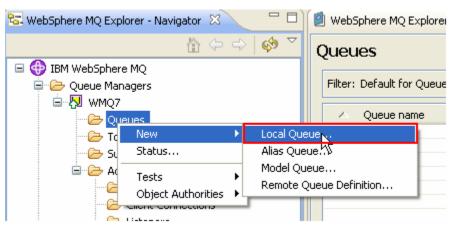
Topic String	Publish	Subscribe	Durable subscriptions	Default priority	Default persistence	Model durable queue
<b>■</b> /						
finance	Inhibited	Inhibited	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL
⊟ sport	Inhibited	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL
basketball	Inhibited	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL
football	Inhibited	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
news	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
hursley	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
fundraising	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
raffle	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
players	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
hursley	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
romsey	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
winchester	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
results	Inhibited	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
hursley	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
romsey	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
winchester	Allowed	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
rules	Inhibited	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
offside	Inhibited	Allowed	Allowed	0	Not persistent	SYSTEM.DURABLE.MODEL.
<	<					

This concludes this portion of Lab 3.

#### 3.4 Administered Subscriptions

While it is typical for subscribers to register their own subscriptions, it is possible to administratively register a subscription using MQ Explorer. This is a subscription to a topic string that delivers messages to a queue. This can be very useful because it is a way for a legacy program which was designed as a point-to-point application to read a queue associated with a topic; in this way it can participate in publish/subscribe without changing the program. You will now explore how such a subscription can be set up and used.

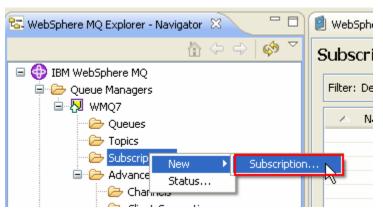
\_\_\_1. In the MQ Explorer, select "Queues". Right-click and select "New→Local Queue".



\_\_\_2. Name the queue "ALL\_FOOTBALL\_Q" and press "Finish".

🗢 New Local Queue	
Create a Local Queue Enter the details of the object you wish to create	4
Name:	^
ALL_FOOTBALL_Q	
Select an existing object from which to copy the attributes for the new object.	Ξ
SYSTEM.DEFAULT.LOCAL.QUEUE Select	
When this wizard completes, another wizard can be started automatically to create a matching object.	~
I Iscart wizard to create a matchind JMS Queue	-
	_
< Back Next > Finise Cance	

\_\_3. Select "Subscriptions", right-click and select "New→Subscription".



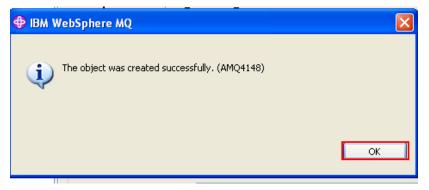
\_\_4. Type ALL\_FOOTBALL\_SUB as the subscription name and then click "Next".

In the second se	_ 0	$\mathbf{X}$
Create a Subscription Enter the details of the object you wish to create		4
Name:         ALL_FOOTBALL_SUB         Select an existing object from which to copy the attributes for the new object.         SYSTEM.DEFAULT.SUB	lect	
< Back Next > Finish	Cancel	

\_\_5. Leave the Topic Name blank, and enter **sport/football/#** as the Topic string. Leave the Destination Queue Manager blank and enter **ALL\_FOOTBALL\_Q** in the Destination Name. Then click **Finish** 

hange the properties of t	
General Extended	General
	Subscription name: ALL_FOOTBALL_SUB
	Торіс
	Topic name:
	Topic string: sport/football/#
	Wildcard usage: Topic level wildcard
	Scope: All
	Destination
	Destination class: Provided
	Destination queue manager:
	Destination name: ALL_FOOTBALL_Q
	Correlation identifier: 00000 00 00 00 00 00 00 00 00 00 00 00

\_\_6. Click **OK** to close the confirmation window.



\_\_\_7. The new administrative subscription appears.

BM WebSphere MQ Explorer						
WebSphere MQ Explorer - Navigator 🕴 👘 🛙	WebSphere MQ Explorer	Content 23			#1	Ø 7 8 8
👔 🗇 🖒 🧔 😨	Subscriptions					
🗐 🧼 Queue Managers	Filter: Default for Subscrip	tions				-
WMQ7     Concerned Co	A Name		Topic string sport/football/#	Identifier #140512057406137202020202	0202020F7F90A4720025494	Dest Qmgr.
- Comparisons				L8		
Channels     Clent Connections						
Listeners     Eevices						
Process Definitions Process Definitions						
Authentication Information     Queue Manager Clusters						
- Compared Objects	Scheme: Default for Subsc	viptions - Distrib	ited			-
	Last updated: 12:32:34					
	WebSphere MQ Explorer	🚯 WebSphere MQ Explorer - Test Results 🔯				
	0 errors, 0 warnings, 0 infos					
	<ul> <li>Description</li> </ul>			Object name	Category	

Double-click on the new subscription to see its attributes.

- General Extended	General	
- Statistics	Subscription name: ALL_FO	DTBALL_SUB
	Topic	
	Topic name:	
	Topic string: sport/footbal	(#
	Wildcard schema: Topic	
	Scope: Al	
	Destination	
	Destination class:	Provided
	Destination queue manager	
	Destination name:	ALL_FOOTBALL_Q
	Correl ID:	00000 41 4D 51 20 57 4D 51 3720 20 20 20 20 20 20 00010 66 B0 94 47 20 00 51 49
		Edt.
	Durable: Yes	
	Type: Admin	
	Properties: None	
	User data:	
	Selector:	
		Apply

\_\_8. The attributes of the new subscription are displayed.

This subscription will now route all qualifying messages to the local queue "ALL\_FOOTBALL\_Q"

\_\_9. Close the properties window by clicking on **Cancel.** 

This concludes this portion of Lab 3.

### 3.5 Testing Publications and Subscriptions from the command line

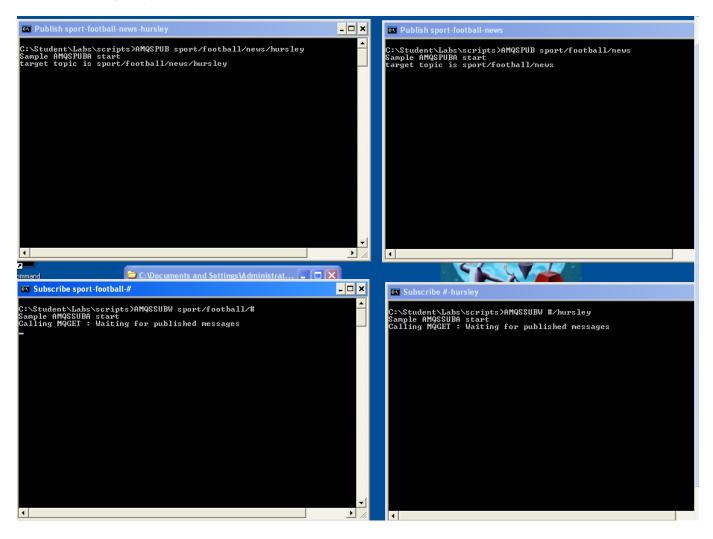
You will now use two more sample programs that are supplied with WebSphere MQ to further test WebSphere MQ publish and subscribe capabilities, called amqspub and amqssub.

\_\_\_1. A folder on the desktop contains four shortcuts that will start two instances of a publishing sample, and two subscribers. Open the folder and then double-click each shortcut to launch the programs.



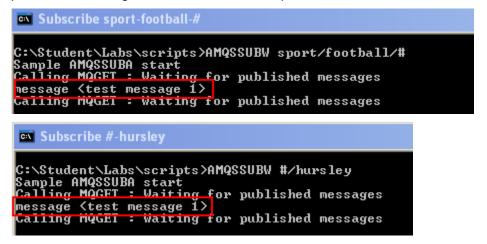
😂 C:\Documents and Setting	gs VA dministrat 🔳 🗖 🔀
File Edit View Favorites T	Fools Help 🥂
🕞 Back 🔹 🌍 🔹 🏂 🍃	🔎 Search 🔀 Folders 🂙
Address 🛅 C:\Documents and Set	:tings\Administrator\[ 🔽 🔁 Go
Name 🔺	Size Type
Publish sport-football-news	1 KB Shortcut
Publish sport-football-news-h	1 KB Shortcut
🔊 Subscribe #-hursley	1 KB Shortcut
🔊 Subscribe sport-football-#	1 KB Shortcut
<	>
4 objects 3.78 KB	🚽 My Computer

\_2. The top two windows are the *topic publishers* (amqspub) Each time you type text into either window, the windows on the bottom, the *topic subscribers* (amqssub) will receive the text as published messages because the topic string that they are subscribing to matched the one being used by the publishers.

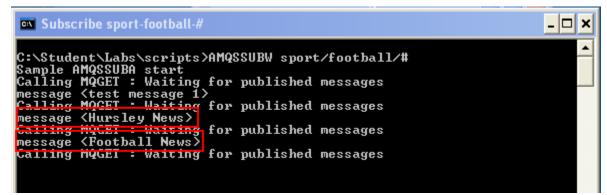




\_\_3. Now in the top <u>left</u> window (publishing to sport/football/news/hursley) enter "test message 1" and press Enter. The message should appear in *both* subscribing windows because the published message matched both subscriptions.



- \_\_\_4. Again in the top left window type the text "Hursley News" and then press "Enter".
- \_\_5. In the top <u>right</u> window type the text "Football News" and press "Enter". Notice that the sport/football/# subscription gets <u>both</u> publications. This is because when you subscribed you used a *multi-level wildcard* (#) to indicate that you were interested in messages published to the sport/football" topic or any of its children, so you will get both messages.



\_6. On the other hand, the **#/hursley** subscription gets only one.

Subscribe #-hursley C:\Student\Labs\scripts>AMQSSUBW #/hursley Sample AMQSSUBA start Calling MQGET : Waiting for published messages message <test message 1> Calling MOGET : Waiting for published messages message <Hursley News> Calling MQGET : Waiting for published messages \_\_\_7. Return to the Subscriptions view in the MQ Explorer. Select the **ALL\_FOOTBALL\_SUB** subscription, right-click and select "**Status**".

🕏 IBM WebSphere MQ Explorer 📃 🗖 🔀						
File Window Help						
🔁 WebSphe 🛛 🗖 🗖	🕑 WebSphere MQ Explorer - Content 🛛 🎽	🔅 🗸 🗖 🗖				
	Subscriptions					
IBM WebSphere MQ	Filter: Default for Subscriptions	▽				
iania All iania WMO7	A Subscription name Topic name Topic string Wildcard usage Scope Destination	n class De				
🗁 Queu	Image: Sport/Football/#         Topic level wildcard         All         Managed	WM				
🗁 Topic		WM				
🗁 Subsc	BALL_FOOTBALL_SUB sport/football/#   Topic level wildcard   All   Provided					
🗄 🗁 Adva	Compare with					
🗁 Queue Manager (						
🖹 🧁 JMS Administerec	Delete					
Context1	Properties					
🗁 Connectio		>				
🦾 🥭 Destinatio		~				
	Scheme: Default for Subscriptions - Distributed					
	Last updated: 11:06:03					
	🖳 WebSphere MQ Explorer - Test Results 🛛 🌐 🎇 🌱 🗖					
	0 errors, 0 warnings, 0 infos					
<	Description Object name Category	=				
	:					

\_\_8. The message count should have a count of the messages that were published on this topic. Click on **Close** to close the status window.

Ð	ALL_FOOTBALL_SU	IB - Status 📃 🗖 🔀				
Qu	eue Manager: WMQ7	Subscription Name: ALL_FOOTBALL_SUB				
	Subscription name	ALL_FOOTBALL_SUB				
	Subscription ID	414D5120574D5137202020202020202020F9A2				
	User	student				
	Durable	Yes				
	Туре	Admin				
	Connection ID	000000000000000000000000000000000000000				
	Resume date					
	Resume time					
	Date of last message	Aug 18, 2008				
	Time of last message	11:30:16 AM				
	Message count	3				
-						
-						
	<					
Г		· · · · · · · · · · · · · · · · · · ·				
	Scheme: Default for Subscription Status - Distributed					
Π	Last updated: 11:30:54					
	S					
(7	2	Refresh				

\_\_\_9. Right-click on the MQ queue **ALL\_FOOTBALL\_Q** and select **Browse Messages** 

2	🗐 WebSphere MQ Explorer - Content 🛛 👘 🛷 🏱 🗖 🗖						
ς	Queues						
	Filter: Default for Queues						•
	<ul> <li>Queue name</li> </ul>	Queue type	Definition type	Open input count	Open output count	Current queue depth	Max queu
	ALL_FOOTBALL_Q	Local Compare	Bredefined with	0	0	2	5000
		Status Delete					
		Clear Messages Put Test Message					
		Create J	Messages MS QueueV				
	<	Propertie	uthorities				>
Scheme: Default for Queues - Distributed							
1	Last updated: 13:58:41						

\_\_10. You should see three messages on the queue (or as many as you put in the amqspub test). Select one of the messages, right-click and choose "**Properties**".

	Message browser								
	Queue Manager Name: Queue Name:		DTBALL_Q						
	🛆 Position	Put date	e/time	User identifier	Put application name	Format	Data length	Message data	Αςςοι
	1	Aug 12	2000 4.51.40 PM	ldent	WMQ7	MQHRF2	106	RFH 🗆	16010
	2	Aug 1:	Compare with	dent	WMQ7	MQHRF2	104	RFH 🗆	16010
	3	Aug 1:	Properties	dent	WMQ7	MQHRF2	97	RFH 🗆	16010
		4							
	<								>
	Scheme: Default for I	Meccanec							~
	Scheme, Deradicitori	nessayes							
	Last updated: 13:55:1	19							
	<ol> <li>All available mess</li> </ol>	ages on t	he queue have be	en browsed. Pres	ss the refresh button fo	r new mess	ages.		
<	4							<u>R</u> efresh	

\_\_\_11. Click on the "Named Properties" tab. From this display you can see the originating topic string.

Message 2 - Properties					
General Report Context Identifiers Segmentation Mamed Properties Data	Named Properties				
	Name mqps.Top	Value sport/football/news/hursley			
	<				
		Apply			
0		OK Cancel			

\_\_\_12. Close the four or five open command windows as you will no longer need them.

This concludes Lab 3.

# Lab 4 WebSphere MQ Security lab

## 4.1 WebSphere MQ Security Lab Overview

This lab will demonstrate WebSphere MQ security administration for point-to-point as well as publish/subscribe MQ objects using the WebSphere MQ Explorer.

## 4.2 Review the security on the system

\_\_\_1. There are several user ids that are pre-defined on your system. You will be using the user called "Anna" and also "Brian" to demonstrate some of the security capabilities of WebSphere MQ V7.

Username	Role
Anna	Superuser, member of the mqm group
Brian	Subscriber
Cathy	Result publisher
David	Journalist, can publish to news
Erica	Manager of Hursley football club
Zero	A user without access to the MQ system

## 4.3 Using RUNAS to change runtime authority.

\_\_\_1. Using the Windows explorer, navigate to the directory C:\Student\Lab\_WMQSecurity\scripts

\_\_2. To run as a different user you will use a program called "runas". For example, to "runas" user Anna, double-click the script "Runas\_anna.cmd". This will prompt for your password (which is passw0rd with a zero ("0") for the "o") and open a command window running with that user's authority.

C:\Student\Lab_WMQSecurity\scripts		
File Edit View Favorites Tools Help		
G Back 🔹 🕥 🕤 🏂 🔎 Search 📂 Folders		≫ 🗙 🍤 💷 -
Address 🛅 C:\Student\Lab_WMQSecurity\scripts		
Folders	×	Name 🔺
<ul> <li>Program Files</li> <li>sdwork</li> <li>Student</li> <li>Lab_Client</li> <li>Lab_HTTP</li> <li>Lab_Intro</li> <li>Lab_JMSSetup</li> <li>Lab_PubSubAdmin</li> <li>Lab_WMQSecurity</li> <li>scripts</li> <li>Scripts</li> <li>Scripts</li> <li>swd</li> <li>temp</li> </ul>		<ul> <li>Create1Users.cmd</li> <li>Create2Groups.cmd</li> <li>Grant1MQSec.cmd</li> <li>Grant2Users.cmd</li> <li>Runas_anna.cmd</li> <li>Runas_brian.cmd</li> <li>Runas_cathy.cmd</li> <li>Runas_david.cmd</li> <li>Runas_erica.cmd</li> <li>Runas_zero.cmd</li> </ul>
Controls.	~	

Type: Windows NT Command Script Date Modified: 6/5/2008 4:57 PM Size: 42 bytes

**\_\_3.** Type in the password for Anna which is **passw0rd (**with a zero ("0") for the "o")

C:\WINDOWS\system32\cmd.exe	- 🗆 🗙
C:\Student\Lab_WMQSecurity\scripts>runas /user:anna "cmd /k cd c:\\" Enter the password for anna:	
	•

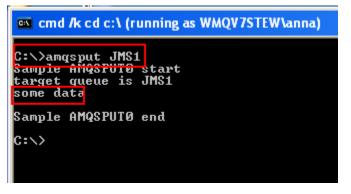
\_\_\_4. You are now running as user Anna.

This concludes this portion of Lab 4.

🛋 cmd /k cd c:\ (running as WMQV7STEW\anna)	
C:\>_	

## 4.4 Point to Point (Queue) Security

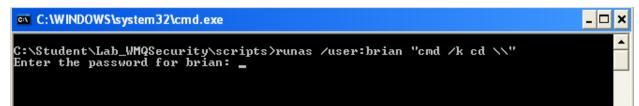
- \_\_\_1. Anna is a "**super user**" because her user id is a member of the **mqm** group. She is able to basically do anything without security stopping her.
- \_\_2. In the runas window of Anna, type in the following command: amqsput JMS1. Type in some text, press Enter, and then press the Enter key a second time to end amqsput. Everything should work fine as expected.



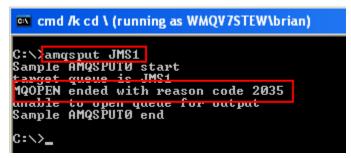
- \_\_3. Leave the runas Anna window open, you will need it in a later step.
- \_\_\_4. Find the **Runas\_brian.cmd** command and double-click to run it.

C:\Student\Lab_WMQSecurity\scripts				
File Edit View Favorites Tools Help				
G Back 🔹 🕥 🕤 🏂 🔎 Search 🔊 Folders		🏂 🗙 🍤 💷 ·		
Address 🛅 C:\Student\Lab_WMQSecurity\scripts				
Folders	×	Name 🔺		
⊞ 🛅 Program Files ⊞ 🦳 sdwork	^	<ul> <li>Create1Users.cmd</li> <li>Create2Groups.cmd</li> </ul>		
		Grant1MQSec.cmd		
🛅 Lab_Client		Grant2Users.cmd		
		Runas anna.cmd		
i Lab_Intro i Lab_JMSSetup		Runas_brian.cmd Runas_cathy.cmd		
🗉 🚞 Lab_PubSubAdmin		Runas_david.cmd		
Lab_WMQSecurity     image: scripts		Runas_erica.cmd Runas_zero.cmd		
🖃 🧰 Other				

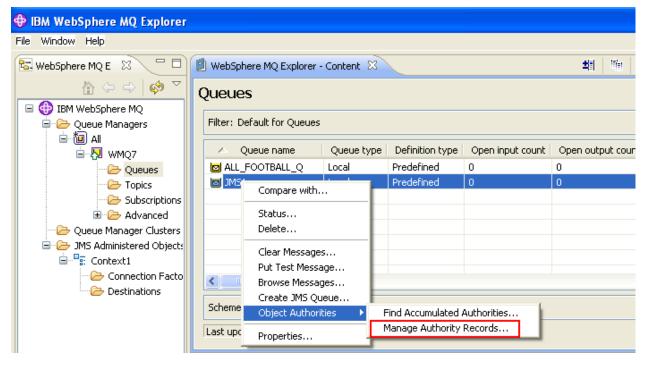
\_\_5. The password is **'passw0rd**.



\_6. Run the **amqsput** program again. **(amqsput JMS1).** User Brian is not authorized to write messages to that MQ queue.



\_\_7. There are several methods of administering Object Authority Manager permissions; programmatically, from the command line, or using the MQ Explorer. You will use the MQ Explorer. Open the MQ Explorer and then click on Queues. Right-click on the queue called JMS1, then on Object Authorities→Manage Authority Records...



\_\_\_8. Expand **Specific Profiles**, and then click on **JMS1.** Make sure that the **Users** tab is selected. Now click on the **New...** button

WMQ7 - JMS1 - Manage Authority Re	ecords							
Specific Profiles	Groups Users							
Generic Profiles	Name	Browse	Change	Clear ✓	Delete	Displa		
	Last updated: 14:37:53							
	Accumulated authorities		Compa	ire	New			

\_\_9. You are going to set up a user entry for the user id **brian.** Type **brian** as the Entity Name. Under **Authorities** click next to **Put**. Then click on **OK.** 

🗎 New Authorities		×
Entity type:	User	
Entity name:	brian	
Object type:	Queue	
Profile name:	JMS1	
Queue manager name:	WMQ7	
Authorities Administration Change Clear Delete Display	Context       MQI         Pass all context       Browse         Pass identity context       Get         Set all context       Inquire         Set identity context       Yeut         Set identity context       Set	
	Select all Deselect all	
	OK	3

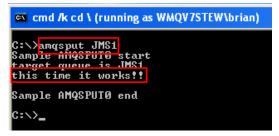
\_\_\_10. Click on **OK** to close the confirmation window.



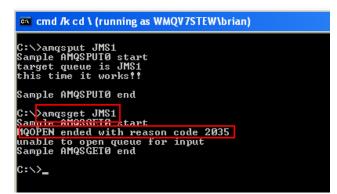
\_\_\_11. Notice that a user record has been added with Put authority for user brian. Click on **Close** to close this window.

WMQ7 - JMS1 - Manage Authority Reco	Groups Users									
	🛆 Name	Browse	Change	Clear	Delete	Display	Get	Inquire	Put	
	brian@WMQV7STEW	~	<b>v</b>	~	~	~	~	~	<b>~</b>	
	Last updated: 14:46:14 Accumulated authorities		Cor	npare	New		Edit	, [	Delete	
								Refres	sh Clo	)se

\_\_\_12. Go back to the runas brian command window and type in **amqsput JMS1**. This time it should be successful. Enter some data; then press Enter again to stop the program.



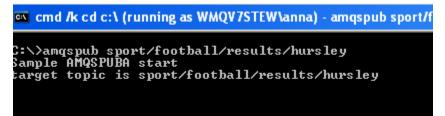
\_\_13. You gave the user id brian the ability to put messages to queues, but not to read or browse messages. In the runas brian command window type in amqsget JMS1. This should fail with a return code 2035, MQRC\_NOT\_AUTHORIZED.



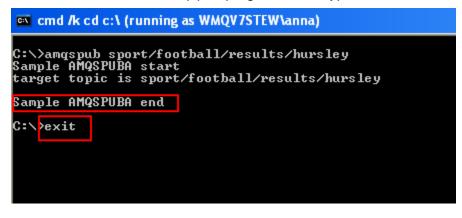
This concludes this portion of Lab 4.

### 4.5 Pub/Sub (Topic) Security

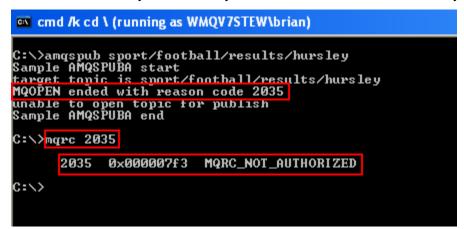
\_\_1. You are going to do the same tests using Pub/Sub security to secure topics. As a test, try to publish to topic sport/football/results/hursley. In the "runas" window for Anna, type amqspub sport/football/results/hursley and press Enter. This should be successful, as Anna is a "superuser".



\_\_\_2. Press Enter to end the amqspub program. Then type in **Exit** to close the runas Anna window.



\_\_3. Now try a userid that is not authorized to publish to a topic. Return to the Runas\_brian.cmd. Again, try to publish to topic *sport/football/results/hursley*. In the window type **amqspub sport/football/results/hursley** and press Enter. This should end with a 2035 return code. Type in the command **mqrc 2035** and you should see that this is a security error.



\_\_4. You will see more interesting information in the Windows event viewer. To open the event viewer find the shortcut in the Start Menu.



\_\_5. You will see a number of warnings produced because of the 2035 return code. Double-click on the first warning to display its contents

Event Viewer							
File Action View Help							
Event Viewer (Local)  Application  Security  System	Application 534	event(s)					
	Туре	Date	Time	Source			
	\Lambda Warning	8/14/2008	9:35:15 AM	WebSphere MQ			
	\Lambda Warning	8/14/2008	9:35:15 AM	WebSphere MQ			
	\Lambda Warning	8/14/2008	9:35:15 AM	WebSphere MQ			
	🔥 Warning	8/14/2008	9:35:15 AM	WebSphere MQ			
	🔥 Warning	8/14/2008	9:35:15 AM	WebSphere MQ			
	Information	8/14/2008	9:25:03 AM	SecurityCenter			
	Information	8/14/2008	9:25:01 AM	WebSphere MQ			
	🔾 Information	8/14/2008	9:25:01 AM	WebSphere MQ			

Event Prope	erties					? 🗙
Event						
Time: Type: User:	8/14/2008 9:35:15 AM Warning N/A WMQV7STE	Source: Category: Event ID: W	WebSphe None 8077	ere MQ		<ul> <li>↑</li> <li>↓</li> <li>▲</li> </ul>
'SYSTEM. The specif following re Ensure tha	: n' has insuffici BASE.TOPIC equested perm t the correct I d object, or ei	: ot authorize nissions are evel of auth	d to acces: unauthoriz nority has b	s the req ed: pub een set f	or this en	tity against
Data: ()	Bytes () Wo	rds				~
			ік (	Canc	el	Apply

\_6. **SYSTEM.BASE.TOPIC** is the root topic object for the topic tree as a whole. Click on the down arrow to browse through the remaining warnings.

Entity 'brian' has insufficient authority to access object 'SPORT' The specified entity is not authorized to access the required object. The following requested permissions are unauthorized: pub Ensure that the correct level of authority has been set for this entity against the required object, or ensure that the entity is a member of a privileged group. Entity 'brian' has insufficient authority to access object 'SPORT.FOOTBALL'. The specified entity is not authorized to access the required object. The following requested permissions are unauthorized: pub Ensure that the correct level of authority has been set for this entity against the required object, or ensure that the entity is a member of a privileged group. Entity 'brian' has insufficient authority to access object 'SPORT.FOOTBALL.RESULTS'.

The specified entity is not authorized to access the required object. The following requested permissions are unauthorized: pub

Ensure that the correct level of authority has been set for this entity against the required object, or ensure that the entity is a member of a privileged group.

Entity 'brian' has insufficient authority to access object SPORT.FOOTBALL.RESULTS.HURSLEY'.

The specified entity is not authorized to access the required object. The following requested permissions are unauthorized: pub

Ensure that the correct level of authority has been set for this entity against the required object, or ensure that the entity is a member of a privileged group.

This concludes this portion of Lab 4.

### 4.6 Using the MQ Explorer to manage security

User Brian needs access to this topic! So in the next section you will use the MQ Explorer to create the permissions that Brian needs to access the topic **sport/football/results/hursley**.

\_\_\_1. Open the MQ Explorer and click on **Topics** 

Window Help			
WebSphere MQ Explorer - 🛛 🗌 🗖	🗐 WebSphere MQ Explorer - Content 🛛		
h 🗘 🗘 🕅	Topics		
💮 IBM WebSphere MQ			
🖃 🗁 Queue Managers	Filter: Default for Topics		
🖹 🛃 WMQ7		Topic type	Topic string
Queues			
Topics	FINANCE	Local	finance
	Money	Local	finance/cash/gettingit/frombanks
🖻 🗁 Advanced	SPORT SPORT	Local	sport
- 🗁 Queue Manager Clusters	SPORT.BASKETBALL	Local	sport/basketball
🖃 🥭 JMS Administered Objects	SPORT.FOOTBALL	Local	sport/football
🖃 📲 Context1	SPORT.FOOTBALL.NEWS	Local	sport/football/news
Connection Factories	SPORT.FOOTBALL.PLAYERS	Local	sport/football/players
	SPORT.FOOTBALL.PLAYERS.HURSLEY	Local	sport/football/players/hursley
	SPORT.FOOTBALL.PLAYERS.ROMSEY	Local	sport/football/players/romsey
	SPORT.FOOTBALL.PLAYERS.WINCHESTER	Local	sport/football/players/winchester
	SPORT.FOOTBALL.RESULTS	Local	sport/football/results
	SPORT.FOOTBALL.RESULTS.HURSLEY	Local	sport/football/results/hursley
	SPORT.FOOTBALL.RESULTS.ROMSEY	Local	sport/football/results/romsey
	SPORT.FOOTBALL.RESULTS.WINCHESTER	Local	sport/football/results/winchester

\_\_\_2. Right-click on the topic name SPORT.FOOTBALL.RESULTS.HURSLEY. Select Object Authorities→Manage Authority Records...

ilter: Default for	r Topics				
🛆 Topic nam	e	Topic type	Topic string		
FINANCE		Local	finance		
🖹 Money		Local	finance/cash/gettingit/frombanks		
SPORT 🖹		Local	sport		
E SPORT.BASKE	ETBALL	Local	sport/basketball		
SPORT.FOOT	BALL	Local	sport/football		
SPORT.FOOT	BALL.NEWS	Local	sport/football/news		
SPORT.FOOT	BALL.PLAYERS	Local	sport/football/players		
SPORT.FOOT	BALL.PLAYERS.HURSLEY	Local	sport/football/players/hursley		
SPORT.FOOT	BALL.PLAYERS.ROMSEY	Local	sport/football/players/romsey		
SPORT.FOOT	BALL.PLAYERS.WINCHESTER	Local	sport/football/players/winchester		
SPORT.FOOT	BALL.RESULTS	Local	sport/football/results		
SPORT.FOC	Compare with		sport/football/results/hursley		
SPORT.FOC_	Compare with		sport/football/results/romsey		
SPORT.FOC	Status		sport/football/results/winchester		
	Delete				
	Clear Local Retained Publicatio	D			
	Topic Status - Subscribers	·····			
	Topic Status - Publishers				
	Test Publication				
	Test Subscription				
	Create JMS Topic				
	Object Authorities	► Fi	nd Accumulated Authorities		
	Properties	M	Manage Authority Records		

\_\_3. A new window will open showing groups and users for the specific profile. Click on the Specific Profile **SPORT.FOOTBALL.RESULTS.HURSLEY**. Now click on the **Users tab**. Finally, click on the **New**... button. You are going to create a user record for the user id brian.

t F

\_\_\_4. Enter brian as the user name. Under Authorities→MQI click on the Publish checkbox. Then click on OK

New Authorities	
Entity type:	User
Entity name:	brian
Object type:	Торіс
Profile name:	SPORT.FOOTBALL.RESULTS.HURSLEY
Queue manager name:	WMQ7
Authorities Administration Change Clear Delete Display Ctrl	Context Pass all context Pass identity context Set all context Set identity context Set identity context
	Select all Deselect all
	OKCancel

\_\_5. Click OK to dismiss the confirmation box.

🖺 IBM WebSphere MQ	X
The authority was created successfully. (AMQ4811)	
	ОК

\_\_\_6. You have now built a security tree where Brian is granted authority to publish football results. Scroll to the right to see the green checkmark under the Publish column.

昌 V	MQ7 - SPORT.FOOTBALL.RESULTS.HUR	SL	EY - Manage	Authority Record	;				
6	Specific Profiles SPORT.FOOTBALL.RESULTS.HURSLEY		Groups User	_		Set identity context	Ctrl	Publish	Su

\_\_\_7. Test that Brian can publish to the **sport/football/results/hursley** topic (double-click on the **Runas\_brian.cmd** script, enter the **passw0rd** then enter the command **amqspub sport/football/results/hursley** and type a test message to the Topic

🔤 cmd /k cd \ (running as WMQV7STEW\brian)
C:\>amqspub sport/football/results/hursley Sample AMQSPUBA start target topic is sport/football/results/hursley This is a test message, and it's working!!
Sample AMQSPUBA end
C:\>

This concludes the Publish/Subscribe lab.

# Lab 5 WebSphere MQ HTTP Bridge

In this lab you will be introduced to the WebSphere MQ – HTTP Bridge. You will exercise some of the features of the Bridge and see how easy it is to enable browser-based applications to access MQ resources.

This lab does use some external tools that are not shipped as part of WebSphere MQ. For example, you will employ a standalone HTTP Listener program available from IBM<sup>®</sup> as a SupportPac<sup>™</sup> (SupportPac MA94) – this is a WebSphere MQ product extension, but is not shipped with the product. You will also use cURL. cURL is a freeware tool that provides a command line facility for transferring files using URL syntax. The strong point of cURL is the number of data transfer protocols it supports. You will use it to submit HTTP requests as part of this lab.

In this lab you will:

- Start the stand-alone HTTP Listener program.
- Use cURL to send HTTP requests to the listener.
- See the options and responses available to the listener.
- Use a sample JavaScript program to put and get messages, illustrating a zero footprint MQ client.

The http-listener program and all other resources needed in the lab are supplied in the c:\Student\Lab\_HTTP directory.

This lab assumes that queue manager WMQ7 exists. You were directed to create this during Lab 1.

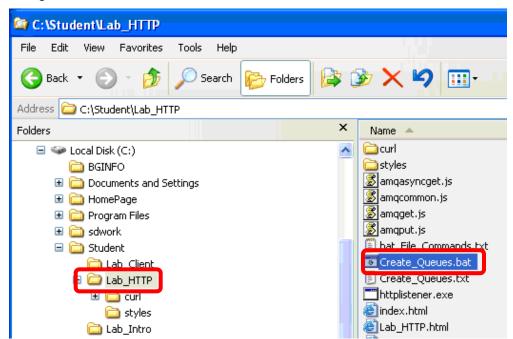
#### 5.1 Create the Required Queues

In Lab 1 you used the MQ Explorer to create some queues. In this lab you will use a command script file for that task so you can see another option that can be used to do this administrative work. This approach uses an MQ utility called **runmqsc**. This program will take a series of MQ administrative commands and execute them. Those commands can come from the keyboard or from a file. In this case a file will be used.

\_\_\_1. Launch **Windows Explorer** using the icon in the system tray (if you have Windows Explorer already launched then bring it into active view).

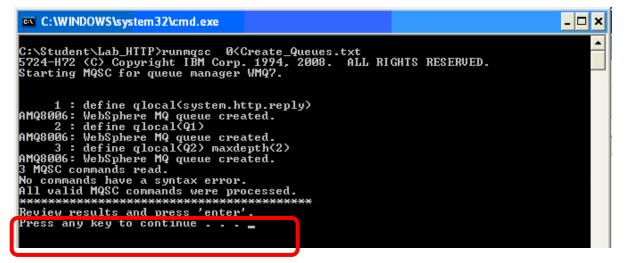


\_2. Navigate to C:\Student\Lab\_HTTP and double-click on the Create\_Queues.bat file.



\_3. The following command is issued: **runmqsc < Create\_Queues.txt** The "<" indicates that the commands will come from a file and that the path to that file follows. You don't have to enter a queue manager name for this command because you specified that WMQ7 was the default queue manager on this system when you created it. If that were not the case the name of the queue manager would follow runmqsc immediately (i.e. runmqsc WMQ7 < Create\_Queues.txt).

Below you see the results from executing the command....hit the Enter key after reviewing.

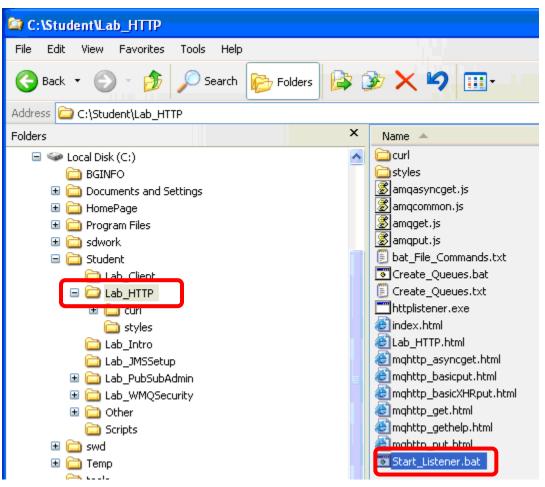


Note that the Q2 queue has been assigned a maximum queue depth of 2.

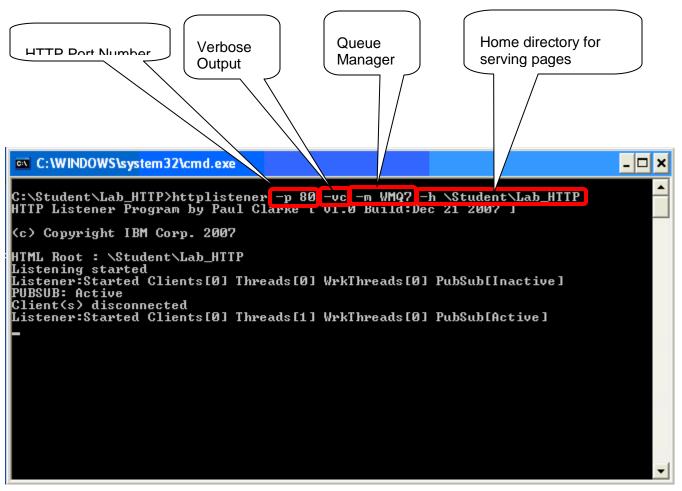
This concludes this portion of Lab 5.

# 5.2 Start The HTTP Listener

\_\_\_1. Double click on the **Start\_Listener.bat** file.



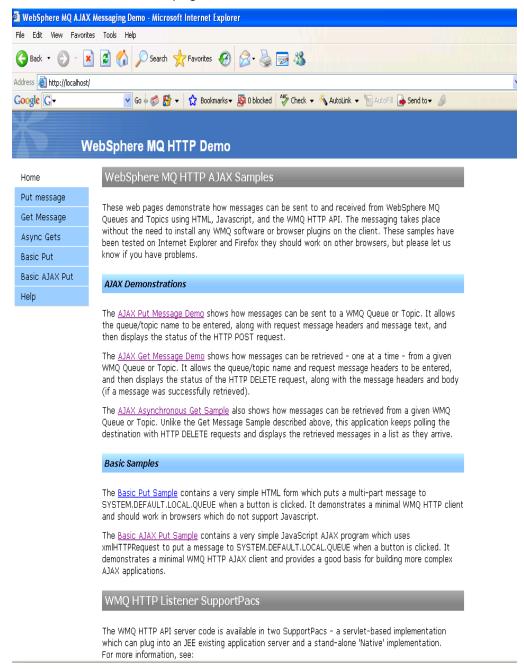
\_\_2. The following command is executed.....review its output. Note that this command window will stay open since the MQ HTTP Listener is going to continue to run in this session.



\_3. This will start a listener on HTTP port 80, connecting to queue manager WQM7. The root for serving web pages will be \Student\Lab\_HTTP...

# Do not close this command window!

\_4. Verify that the listener is running by opening a web browser and pointing it to <u>http://localhost</u>. You should see the web page shown below.



\_\_\_5. This indicates the listener is running. Close the browser.

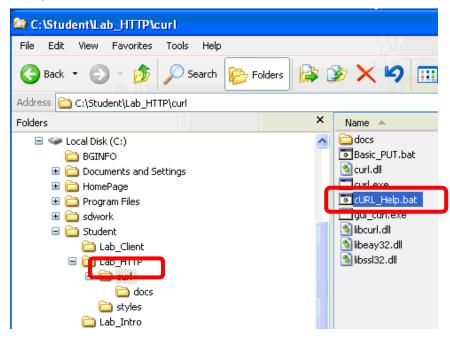
This concludes this portion of Lab 5.

## 5.3 Test the Listener Using cURL

In this section you use the cURL program to send HTTP requests to the listener and examine the responses.

# 5.4 Posting Messages Using HTTP Post

\_\_\_1. Navigate to the **cURL** folder and double click on **cURL\_Help.bat**....



\_\_\_2. The following command is run. **Examine the output** from the command and then hit the Enter key.....

C:\WINDOWS\system32\cmd.exe	- 🗆 י	<
trace-ascii <file> Liketrace but without the hex output</file>	-	
trace-time Add time stamps to trace/verbose output		
-T/upload-file <file> Transfer <file> to remote site</file></file>		
url <url> Set URL to work with</url>		
-u/-user {user[:password]} Set server user and password		
-U/proxy-user <user[:password]> Set proxy user and password -v/verbose Make the operation more talkative</user[:password]>		
-U/Version Show version number and quit		
-w/write-out [format] What to output after completion		
-x/proxy <host[:port]> Use HTTP proxy on given port</host[:port]>		-
-X/proxy (nost:.port) use hirr proxy on given port -X/request (command) Specify request command to use		
-y/speed-time Time needed to trig speed-limit abort. Defaults to 30		
-Y/speed-limit Stop transfer if below speed-limit for 'speed-time' secs		
-z/time-cond (time) Transfer based on a time condition		
-0/http1.0 Use HTTP 1.0 (H)		
-1/tlsv1 Use TLSv1 (SSL)		
-2/sslu2 Use SLu2 (SSL)		
-3/sslu3 Use SSLv3 (SSL)		
-4/ipu4 Resolve name to IPu4 address		
-6/ipv6 Resolve name to IPv6 address		
-#/progress-bar Display transfer progress as a progress bar		
***************************************		
Review the output from the command and then press 'enter'.		
Press any key to continue		
		•

\_\_3. You will use only a few of the options and these are shown below:

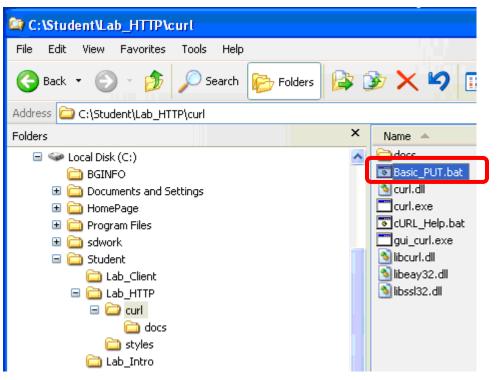
```
curl --help
Usage: curl [options...] <url>
-d/--data <data> HTTP POST data (H)
```

-H/--header <line> Custom header to pass to server (H)  $\ensuremath{\mathsf{C}}$ 

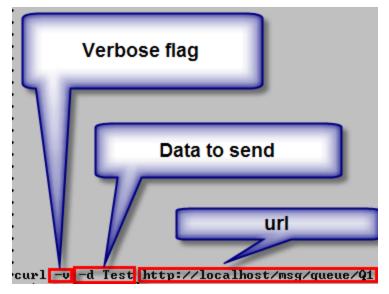
-v/--verbose Make the operation more talkative

### 5.5 A Very Basic PUT

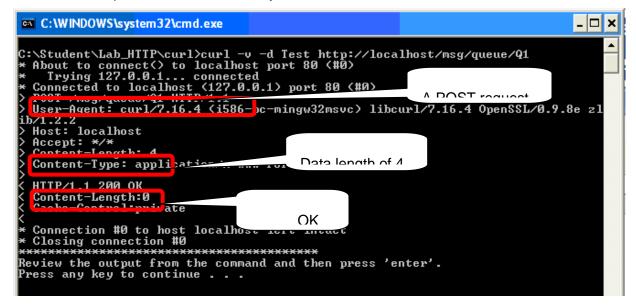
\_\_\_1. Double click on the Basic\_PUT.bat file.....



\_\_\_2. The following command will be run.



\_\_3. Examine its output then hit the Enter key.



\_4. Bring the **MQ Explorer** into active view. Note that you now have a message on **Q1**.

2	🕽 WebSphere MQ Explorer - Content 🕱 🛛 🟥 🔯 🏹 🖓									3
ς	)ueu	ies								
	Filter:	Default for Queues							$\bigtriangledown$	
		Queue name	Queue type	Definition type	Open input count	Open output count	Current	acae depth	Max queu	
	<u>N</u>		Local	Predefined	0	1	1		5000	
	MIC	2	Local	Predefined	0	0	0		2	

\_\_5. Right click on Q1 and select Browse Messages...

🗐 WebSphere MQ	Explorer - Content 🛛				<b>1</b>	🤣 🗸 🗖
Queues						
Filter: Default fo	or Queues					$\bigtriangledown$
🛆 Queue n	ame Queue type	Definition type	Open input count	Open output count	Current queue depth	Max queu
2 Q2	Compare with	ned	0 0	1	1	5000 2
	Status Delete					
	Clear Messages Put Test Message					
	Browse Messages Create JMS Queue Object Authorities	e				
	Properties					

\_6. View the summary data about the message and pay particular attention to the **Put date/time** and the **Put application name**.

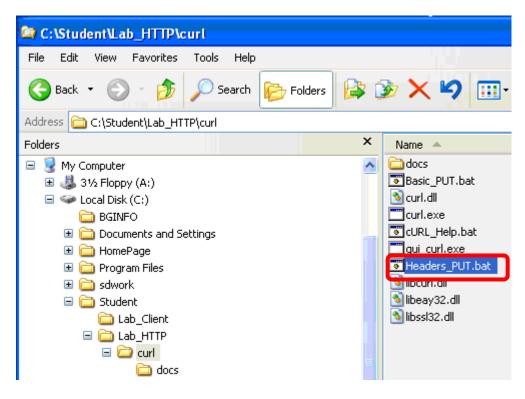
Message browser							
Queue Manager Name Queue Name:	e: WMQ7 Q1						
A Position	Put de te/time	User identifer	Put application name	Format	Data len	th Message da a	Accounting
1	Jul 30, 2008 10:48:40 AM	student	bs\Lab_HTTP\httplistener.exe		4	Test	160105150

\_\_6. Close the Message browser window.

#### 5.6 A PUT with an MQ Property Specified in the Headers

When using the WebSphere MQ – HTTP Bridge, MQ message header fields (MQMD) are conveyed in HTTP headers. This approach conforms to the HTTP specification. All HTTP headers used by MQ are prefixed with "x-msg-". In this portion of the lab you will specify an MQ-specific header property for the HTTP message.

\_\_\_1. Double click on the **Headers\_PUT.bat** file.



\_\_\_2. The following command will be run. **Examine its output** and then hit the **Enter** key.

C:\Student\Lab_HTTP\curl>curl -v -d Test -H [x-msg-persistence:PERSISTENT" http: //localhost/msg/queue/Q1 * About to connect() to localhost port 80 (#0)	C:\WINDOWS\system32\cmd.exe	_ 🗆 ×
<pre>* Trying 127.0.0.1 connected * Connected to localhost (127.0.0.1) port 80 (#0) POST /msg/queue/q1 HTTP/1.1 User-Agent: curl/7.16.4 (i586-pc-mingw32msvc) libcurl/7.16.4 OpenSSL/0.9.8e zl ib/1.2.2 &gt; Host: localhost &gt; Accept: */* x-msg-persistence:PERSISTENT Content-Length: 4 Content-Length: 4 Content-Length:0 Content-Length:0 Content-Length:0 Content-Length:0 Cache-Control:private * Connection #0 to host localhost left intact * Closing connection #0 ************************************</pre>	<pre>//localhost/msg/queue/Q1 * About to connect() to localhost port 80 (#0) * Trying 127.0.0.1 connected * Connected to localhost (127.0.0.1) port 80 (#0) &gt; POST /msg/queue/Q1 HTTP/1.1 &gt; User-Agent: curl/7.16.4 (i586-pc-mingw32msvc) lib ib/1.2.2 &gt; Host: localhost &gt; Accept: */* &gt; x-msg-persistence:PERSISTENT Content-Length: 4 Content-Lume: application/x-uutu form-urlencoded &gt; ( HTTP/1.1 200 OK &lt; Connection #0 to host localhost left intact * Closing connection #0 ************************************</pre>	Setting the header curl/7.16.4 OpenSSL/0.9.8e zl The header as sent by cURL

\_\_\_7. Bring the **MQ Explorer** into active view. Note that the Current queue depth is now 2. **Right click** on **Q1** and select **Browse Messages...** 

2	WebSphere MQ Expl	lorer - Content 🛛				<b>41</b> 🔤	🤣 🗸 🗖 🗖
(	Queues						
	Filter: Default for Qu	ieues					$\bigtriangledown$
	🛆 Queue name	Queue type	Definition type	Open input count	Open output count	Current queue depth	Max queu
		Local	Predefined	0	1	2	5000
	🖬 Q2	Compare with	ined	0	0	0	2
		Status Delete					
		Clear Messages Put Test Message. Browse Messages.					
		biowse messages. neace ond queue )bject Authorities					
		Properties					

\_\_8. Examine the second message to **verify that it is persistent**. You will need to **scroll** quite a bit to the right to see this message property in the display. Click the **Close** button.

Queue Manager Namis:       W1CP         Queue Namis:       Qieue Namis:         Message identifier bytes       Message type       Offset       Original length       Persistence       Pionity       Reply-to queue Reply-to queue Reply-to queue Reply-to graume Qieue       Oil Constraints	🖾 Message browser							
Queue Name:       Q1         Message identifier bytes       Message type       Offset       Original length       Persistence       Priority       Reply-to queue       Reply-to	0							
Message identifier bytes       Message type       Offset       Original length       Persistence       Priority       Reply-to queue       Ref         11405120574051372020202020202020202020202020162904820003F03       Datagram       0       -1       Persistent       0       Wh         114051205740513720202020202020202020202020202020202020								
14051205740513720202020202020202020202020202020202020	-						- • •	
14D5120574D5137202020202020202020202020202020202003F03 Datagram 0 -1 Persistent 0 WM			1				Reply-to queue	
Image: contrast of the state of t		-				-		
Scheme: Default for Messages       Image: Constraint of the state of	+14D5120574D513720202020202020204162904820003F03	Datagram	U	-1	Persistent	U		WP
Scheme: Default for Messages       Image: Comparison of the co								
Scheme: Default for Messages       Image: Comparison of the co								
Scheme: Default for Messages       Image: Constraint of the state of								
Scheme: Default for Messages       Image: Constraint of the state of								
Scheme: Default for Messages       Image: Constraint of the state of								
Scheme: Default for Messages       Image: Constraint of the state of								
Scheme: Default for Messages       Image: Comparison of the co								
Scheme: Default for Messages       Image: Comparison of the co								
Scheme: Default for Messages       Image: Comparison of the co								
Scheme: Default for Messages       Image: Constraint of the state of								
Scheme: Default for Messages       Image: Comparison of the co								
Scheme: Default for Messages       Image: Comparison of the co								
Scheme: Default for Messages       Image: Comparison of the co								
Scheme: Default for Messages       Image: Comparison of the co								
Scheme: Default for Messages       Image: Constraint of the state of								
Last updated: 12:02:33      All available messages on the queue have been browsed. Press the refresh button for new messages.								>
Last updated: 12:02:33      All available messages on the queue have been browsed. Press the refresh button for new messages.	Scheme: Default for Messages							$\bigtriangledown$
All available messages on the queue have been browsed. Press the refresh button for new messages.								
	Last updated: 12:02:33							
		. Due as the coffic		6				_
Refresh Close	All available messages on the queue have been browsed	<ol> <li>Press the refre</li> </ol>	SH DUCCOF	ror new message	35,			
Refresh Close								
							Refresh	liose

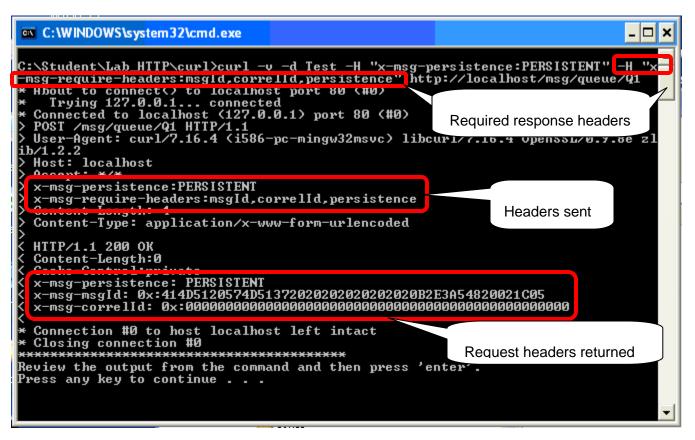
# 5.7 Requesting Information To Be Returned

cURL allows us to use the –H flag repeatedly to add as many headers to a message as you would like. In the next example you will use that capability to request certain information be returned to us in the response headers.

\_\_\_1. Double click on the Return\_PUT.bat file.....

C:\Student\Lab_HTTP\curl	
File Edit View Favorites Tools Help	
🚱 Back 🝷 🕥 🕤 🏂 🔎 Search 📂 F	=olders 📴 🍞 🗙 🍤 💷
Address 🗀 C:\Student\Lab_HTTP\curl	
Folders	× Name 🔺
🖃 🥯 Local Disk (C:)	ocs 🔁
🚞 BGINFO	Basic_PUT.bat
🗉 🚞 Documents and Settings	🔰 curl.dli
표 🚞 HomePage	curl.exe
표 🚞 Program Files	CURL_Help.bat
🖽 🚞 sdwork	gui_curl.exe
🖃 🚞 Student	Headers_PUT.bat
🚞 Lab_Client	🔰 🔊 libcurl.dll
🖃 🚞 Lab_HTTP	🔰 libeay32.dll
🖃 🧰 curl	ibosi02.dll
🚞 docs	Return PUT.bat
🚞 styles	
🗀 Lab_Intro	

\_\_9. The following command is run. **Examine its output** then hit the **Enter** key.



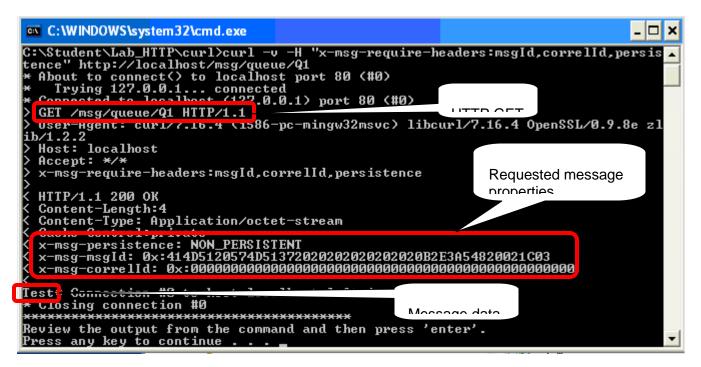
### 5.8 Using cURL To Browse Messages

If the –d flag is omitted (remember this flag indicates HTTP post data) cURL can be used to issue the HTTP GET command. The MQ – HTTP Bridge interprets an HTTP GET as an MQ Browse request...the message content is returned but the message is not removed from the queue....the Browse operation is not destructive.

\_\_1. Double click on the Browse.Bat file.....

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\_\_10. The following command is run. **Examine its output** and hit the **Enter** key.



\_\_11. Repeat the request a few times and note that the same message is returned with each invocation.

This concludes this portion of Lab 5.

# 5.9 Using the HTTP Bridge With JavaScript

Using cURL was instructive because it allows us to see how MQ header properties can flow over the HTTP communication stream without the need for any MQ-specific code. But cURL is not likely to be used by end users.

This part of the lab shows how a simple JavaScript can be used to put and get messages to and from queues.

The C:\Student\Lab\_HTTP directory is the home directory for the HTTP listener to serve pages from. In that directory are two simple JavaScript pages, amq*put.js* and amq*get.js*.

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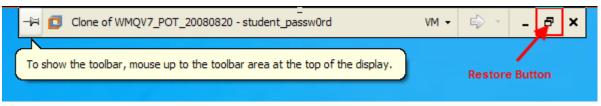
If you understand JavaScript you may want to look at these files to understand them.

One critical point is that a client needs no MQ libraries or code installed to run these JavaScripts.

You demonstrate this by running the next part of the lab **NOT ON THE VMWARE IMAGE** but on the **NATIVE OPERATING SYSTEM OF YOUR COMPUTER** which does not have any MQ code installed on it.

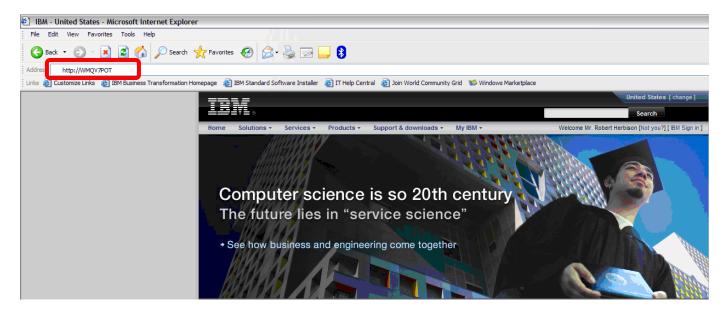
So you will now switch to the desktop of the native system on your computer.

\_\_\_1. At the top of the window, find the VMware Toolbar. It may be hidden, or "unpinned". Place your cursor near the top of the display, and the toolbar will automatically scroll down. Then click on the **Restore button.** Your display should change. You can now more easily switch between the native operating system and the VMware image.



If you have any difficulty switching to the native desktop, ask the instructor for assistance.

\_\_\_12. From the native desktop of your machine, open a web browser and enter http://WMQV7POT as the url and hit Enter

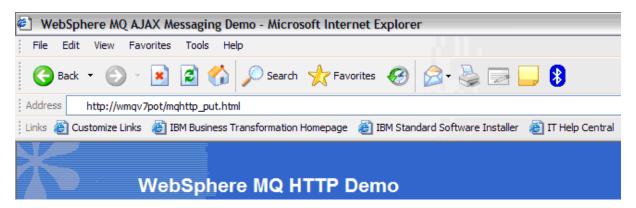


\_\_13. Verify that the following welcome screen is displayed.

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Address 🛃 http://WMQV7						
🗄 Links 🝓 Customize Links	🧃 IBM Business Transformation Homepage 📲 IBM Standard Software Installer 🔮 IT Help Central 📳 Join World Community Grid 1 Windows Marketplace					
	VebSphere MQ HTTP Demo					
Home	WebSphere MQ HTTP AJAX Samples					
Put message						
Get Message	These web pages demonstrate how messages can be sent to and received from WebSphere MQ Queues and Topics using HTML, Javascript, and the VMQ HTTP API. The messaging takes place without the need to install any WMO software or browser plugins on the client. These samples have been tested on Internet Explorer and Firefrox they should work on					
Async Gets	other browsers, but please let us know if you have problems.					
Basic Put	ATAX Demonstrations					
Basic AJAX Put						
Help	The AJAX Put Message Demo shows how messages can be sent to a WMQ Queue or Topic. It allows the queue/topic name to be entered, along with request message headers and message text, and then displays the status of the HTTP POST request.					
	The AJAX Get Message Demo shows how messages can be retrieved - one at a time - from a given WMQ Queue or Topic. It allows the queue/topic name and request message headers to be entered, and then displays the status of the HTTP DELETE request, along with the message headers and body (if a message was successfully retrieved).					
	The AJAX Asynchronous Get Sample also shows how messages can be retrieved from a given WMQ Queue or Topic. Unlike the Get Message Sample described above, this application keeps polling the destination with HTTP DELETE requests and displays the retrieved messages in a list as they arrive.					
	Basic Samples					
	The <u>Basic Put Sample</u> contains a very simple HTML form which puts a multi-part message to SYSTEM.DEFAULT.LOCAL.QUEUE when a button is clicked. It demonstrates a minimal WMQ HTTP client and should work in browsers which do not support Javascript.					
	The <u>Basic AJAX Put Sample</u> contains a very simple JavaScript AJAX program which uses xmlHTTPRequest to put a message to SYSTEM.DEFAULT.LOCAL.QUEUE when a button is clicked. It demonstrates a minimal WMQ HTTP AJAX client and provides a good basis for building more complex AJAX applications.					
	WMQ HTTP Listener SupportPacs					
	The WMQ HTTP API server code is available in two SupportPacs - a servlet-based implementation which can plug into an JEE existing application server and a stand-alone 'Native' implementation. For more information, see:					
	MAOY - WMO HTTP Bridge for JEE					
	MA94 - This SupportPac- the WMQ HTTP Native Listener					

#### 5.10 Using the PUTQ JavaScript

\_\_\_1. Enter the url <a href="http://wmqv7pot/mghttp\_put.html">http://wmqv7pot/mghttp\_put.html</a> and hit Enter



\_\_\_2. Enter "WMQV7 PoT test message data" in the Request Message data box and press the **POST** button.

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Address 🛃 http://WMQV7POT/mqhttp_put.html						
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×						
<b>V N</b>	/ebSphere MQ HTTP Put Demo					
Home	Target URI and Request Headers					
Put message						
Get Message	Target URI Destination Name: SYSTEM.DEFAULT.LOCAL.QUEUE					
Async Gets	Destination Name: SYSTEM.DEFAULT.LOCAL.QUEUE					
Basic Put	URI: http://wmqv7pot/msg/queue/SYSTEM.DEFAULT.LOCAL.QUEUE					
Basic AJAX Put	Add Request Header					
Help	Name: Value: Add Remove Clear					
	x-msq-require-headers: msgId, priority					
	Put message					
	·					
	Request Message data					
	WMQV7 FoI test message data					
	POST					
	Response					
	Response					
	About this Sample					
	This sample allows you to send messages to a WMQ Queue or Topic using HTTP POST and the WMQ HTTP API.					
	Setting the Target URI and Request headers					
	<u>Click here</u> for information about setting the URI and the HTTP header fields and values allowed in a WMQ HTTP POST request. (Note: this link opens a pop-up window. You may need to disable your pop-up blocker to see it).					

Sending a Message

Press the 'POST' button to initiate an HTTP request which sends a message to the named queue or topic. When the operation completes the response status, and any requested headers will be shown.

\_\_3. Observe that you get an **HTTP** 200 response as well as the priority and **msgid** of the message you successfully placed on the queue.

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	Joh Sphore MO HTTP But Dome
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Home	Target URI and Request Headers
Put message	
Get Message	Target URI Destination Name: SYSTEM.DEFAULT.LOCAL.QUEUE
Async Gets	Destination type:
Basic Put	URI: http://wmqv7pot/msg/queue/SYSTEM.DEFAULT.LOCAL.QUEUE
Basic AJAX Put	Add Request Header
Help	Name: Value: Add Remove Clear
	x-msg-require-headers: msgId, priority
	Put message
	Request Message data
	WMQV7 PoT test message data
	POST
	Response
	PUT: Count=1 - HTTP Status: 200
	x-msg-priority: AS_DESTINATION x-msg-msgId: 0x:414D5120574D51372020202020202020AB2FA84820001C05

\_4. Change the Destination Name to Q2 and enter "WMQV7 PoT test message data" in the Request Message data box.

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	VebSphere MQ HTTP Put Demo
Home	Target URI and Request Headers
Put message	
Get Message	Target URI Destination Name Q2
Async Gets	Destination type: 💿 Queue 🔘 Topic
Basic Put	URI: http://wmqv7pot/msg/queue/SYSTEM.DEFAULT.LOCAL.QUEUE
Basic AJAX Put	Add Request Header
Help	Name: Value: Add Remove Clear
	x-msg-require-headers: msgId, priority
	Put message
	пециезствеззаде цата
	WMQV7 PoT test message data
	POST

\_\_5. Press the **POST** button **three times**. The third time you **should get an error** – The max depth of Q2 is only 2.

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×	VebSphere MQ HTTP Put Demo				
Home	Target URI and Request Headers				
Put message					
Get Message	Target URI Destination Name: Q2				
Async Gets	Destination type:   Queue  Topic				
Basic Put	URI: http://wmqv7pot/msg/queue/Q2				
Basic AJAX Put	Add Request Header				
Help	Name: Value: Add Remove Clear				
	x-msg-require-headers: msgId, priority				
	Put message				
Request Message data					
	WMQV7 PoT test message data				
	POST				
	Perponse				
Put failed - Count=4 HTTP response: 404:Not Found					
	x-msq-priority: AS_DESTINATION				

This concludes Lab 5.

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