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# WebSphere Message Broker Admin & Topologies

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# Agenda

- V7 Administration Enhancements
  - No Configuration Manager
  - Command-line
  - Administration API (CMP API)
  - Administrative Security
  - Brokers view for Application Development
  - Message Broker Explorer
  - Administration Queue / Administration Log
  - Resource Statistics
  - No system database
  - Multi-instance Brokers (HA)
  - Publish/subscribe converged with WMQ
  - Per Execution Group Profiles
  - Migrating to V7
- Configurable Services
- Problem Determination



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# V7 Administration Enhancements



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- Making administration easier has been a huge focus area in WMB V7
- There are a huge number of improvements in this area
- V7 Themes
  - Simplicity and Productivity
  - Universal Connectivity for SOA
  - Dynamic Operational Management
  - Platforms, Environments and Performance

# Message Broker V7.0.0.0 Recap



## • Simplicity and Productivity

- **Radically streamlined product prerequisites and components**
- Simplified connectivity solution development using IBM pre-supplied patterns
- Impact Analysis to manage development artefact changes including ESQL, Maps and Message sets
- **MB Explorer for dedicated administration tooling**
- SCA nodes for WPS Interoperability

## • Universal Connectivity for SOA

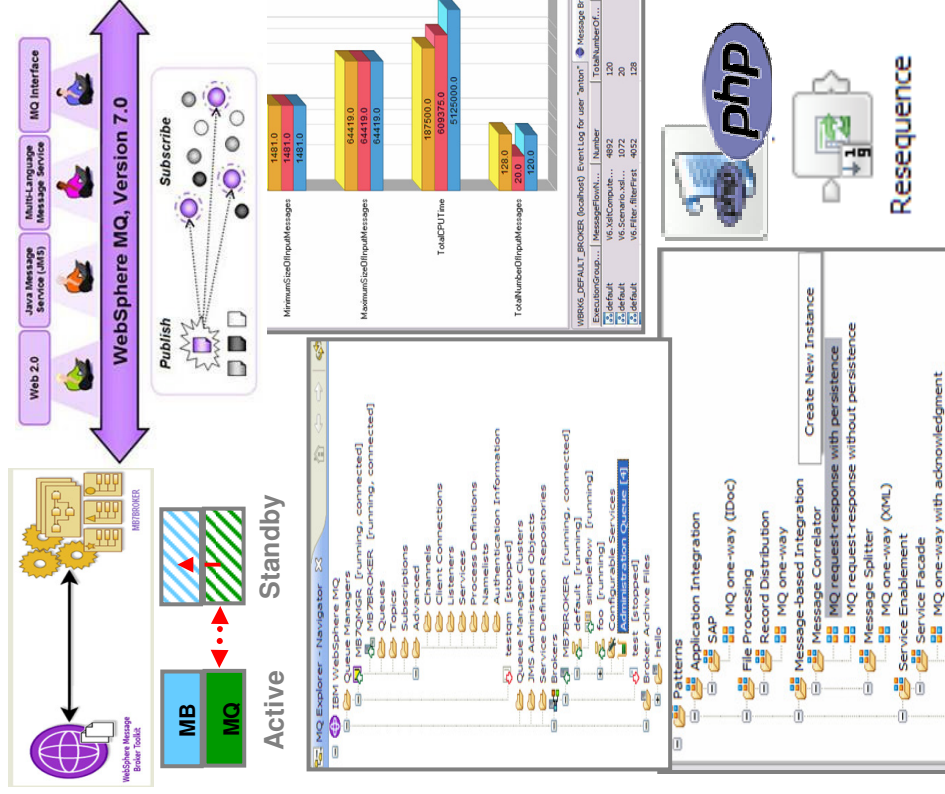
- **Extended & integrated publish, subscribe: common management & security with new MQ capabilities**
- PHP nodes for Web 2.0 support
- Enhanced SAP, Siebel, PeopleSoft packaged application support
- New Sequence and Resequence nodes

## • Dynamic Operational Management

- New operational facilities for audit and monitoring, including WBM
- **Enhanced statistics to understand broker performance, including memory usage**
- Improved user trace to easily understand message flow behaviour
- Enhancements for WSRR processing including support for FSM protocol
- **Support and Exploit MQ Multi-instance Queue Managers for High Availability**

## • Platforms, Environments and Performance

- Exclusively 64bit Broker support
- Performance monitoring tools and very reduced memory footprint



Resequence

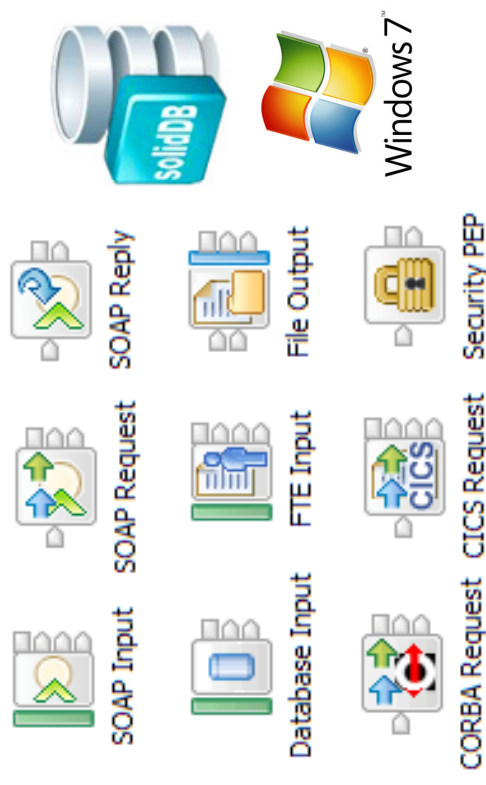
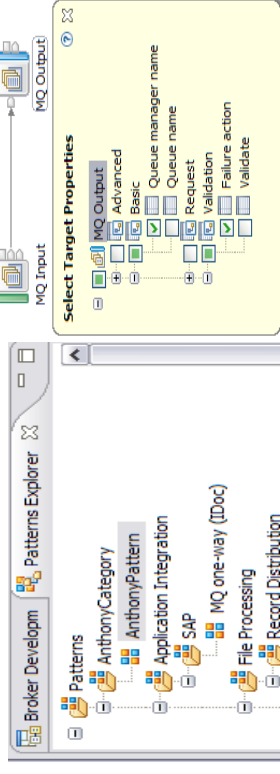
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# Message Broker V7.0.0.1 Recap



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- **Simplicity and Productivity**
  - User Defined Patterns for custom reuse
  - User Defined Sub flows: encapsulate & distribute
  - Expanded Patterns Explorer
- **Universal Connectivity for SOA**
  - SOAP/JMS & more Web Service enhancements
  - Database input node processing of relational data
  - Multi-platform CICS node for direct connectivity
  - FTE file nodes for end-to-end file processing
  - CORBA request node to facade CORBA systems
- **Dynamic Operational Management**
  - SAML, Kerberos, LTPA and RACF pass tickets
  - PEP node for mid-flow security processing
  - **Comprehensive operational resource statistics**
  - Web Services Policy Analytics for WSRR
- **Platforms, Environments and Performance**
  - Windows 7, Server 2008 with 64 bit processes
  - More databases: solidDB, SQL Server z/Linux



mb7fp Imbx Administration Log		default Resources Statistics (Snapshot time 18:02:31 - 18:02:51)						
CICS	CORBA	JVM	ODBC	SOAPIInput	Security	Sockets	FTEAgent	JDBCConnectionPools
name	InitialMemoryInMB	UsedMemoryInMB	CommittedMemoryInMB	MaxMemor	summary	Heap Memory	Non-Heap Mem...	Garbage Collect...
summary	32	23	46	-1				
Heap Memory	32	13	32	256				
Non-Heap Mem...	0	10	14	-1				
Garbage Collect...								

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# Message Broker V7.0.0.2 Recap

- **Simplicity and Productivity**
  - Patterns Refinement to create highly customizable user defined patterns
  - Patterns Communities for packaging, sharing, uploading and rating
  - Tooling enhancements for Mapping, Unit Test & Debugging
- **Universal Connectivity for SOA**
  - Async and transactional SOAP/JMS; New JSON parser for Web 2.0
  - File Read node and other file processing enhancements
  - Email input node to retrieve data from POP and IMAP mail systems
  - JD Edwards nodes to extend ERP processing, and other ERP node enhancements
  - CICS and TCP/IP node enhancements
  - Database input node enhancements for code-free query and WBIA migration
- **Dynamic Operational Management**
  - **WCA Hypervisor edition to simplify provisioning of new and updated brokers**
  - Web Services Gateway function for more manageable processing
  - **Per Execution Group Profiles for multi-tenancy configuration**
  - **Resource Manager Statistics for parsers storage usage**
- **Platforms, Environments and Performance**
  - Enhanced platforms: AIX 7.1, Oracle 11gR2, Informix XA,
  - New support for Oracle AQ and JBoss JMS providers



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Email Input



Cloudburst



JDEdwards Request



JDEdwards Input



File Read

## Patterns Community

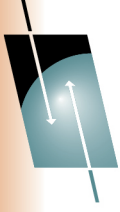
This site shows you how to build a common nodes and much more!

The web site is built using Drupal a ven

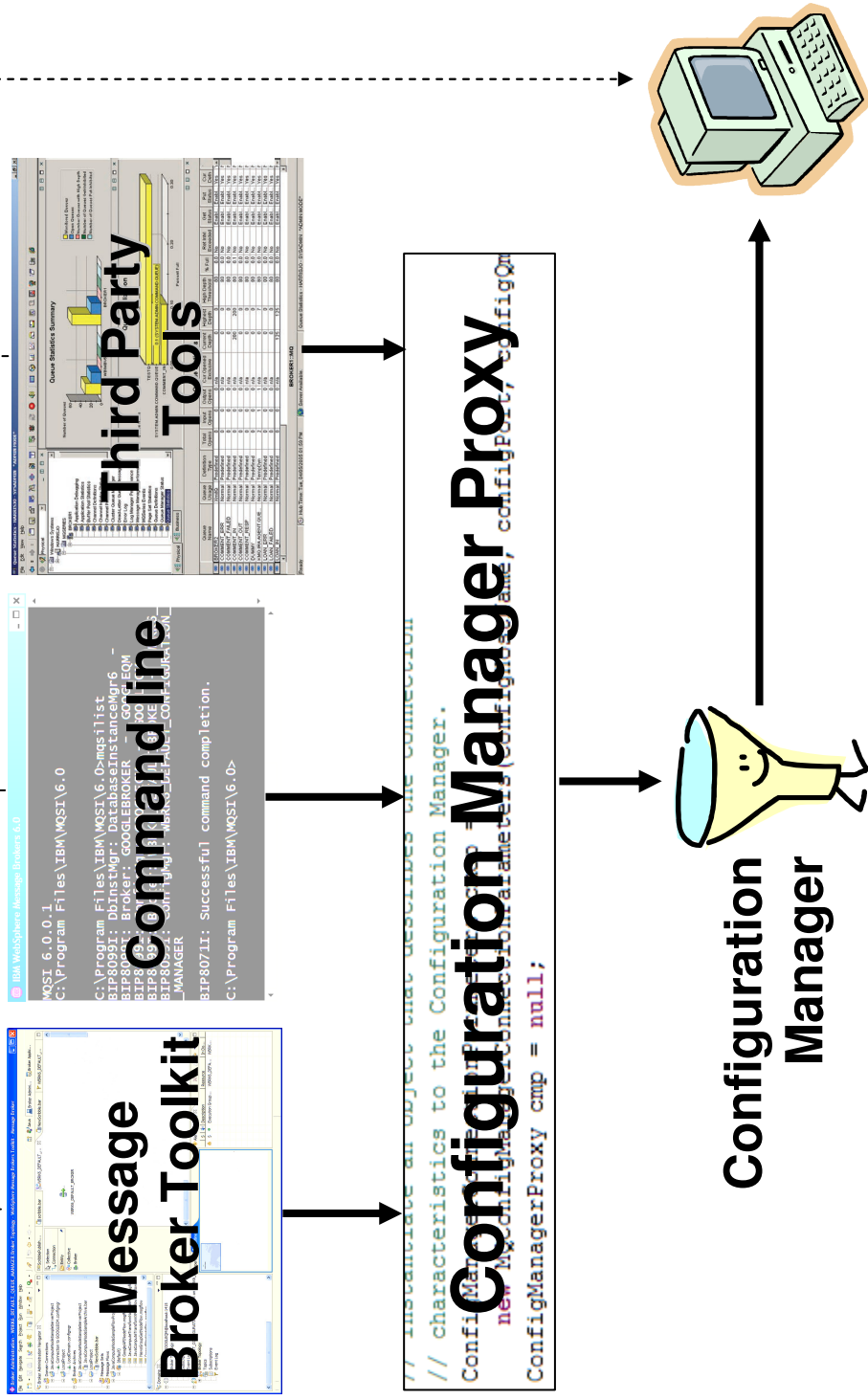
default: Resources Statistics (Snapshot time 07:54:49 - 07:55:09)									
CICS	CORBA	FTEAgent	FTP	File	JDBCConnectionPools	JVM	ODBC	Parsers	S
name	Threads	ApproxMemKB	MaxReadKB	MaxWrittenKB	File				
summary	2	105761.03	0.41	7910.53	60				
CREATELARGE.MQMD	1	15.97	0.36	0.43	2				
CREATELARGE.MQROOT	1	55.89	0.38	0.00	7				
CREATELARGE.Properties	1	15.97	0.38	0.00	4				
CREATELARGE.YMLNSC	1	65639.55	0.03	7910.53	60				
MANYPARSERS.BLOB	1	15.97	0.05	0.05	6				

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# Interaction With Tools (V6.X Recap)



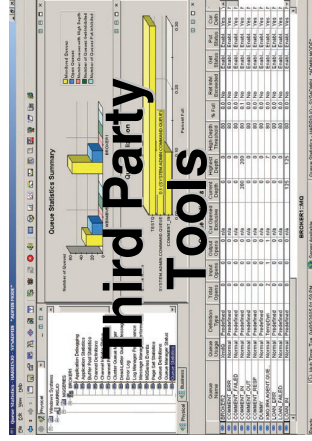
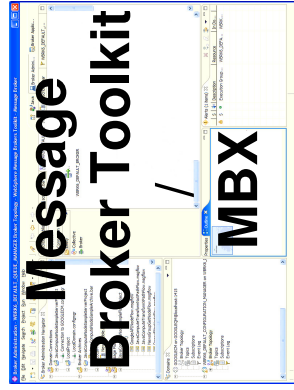
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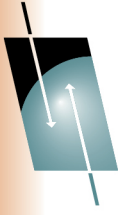
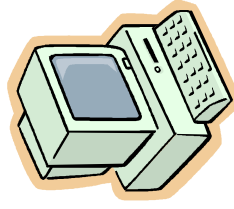
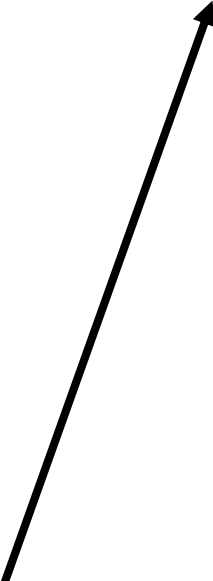
**Broker**

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# Interaction With Tools (V7)



```
// instantiate an object that describes the connection
// characteristics to the broker.
BrokerConnectionParameters kcp
new MQBrokerConnectionParameters (brokerHostName, brokerPort, brokerQmg
BrokerProxy b = null;
```



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# Configuration Manager Removal - Benefits



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- The broker environment will be a lot easier to manage
- One view of the world
- More information returned to tools
- Much improved connect and deploy times
- Long-standing niggles have been eliminated. V7 has:
  - One-step broker creation (i.e. no CM association step)
  - No “Deployment already in progress” messages
  - No CM/Broker Synchronization problems
    - Cancel Deployment
    - Performance
- As well as:
  - No service user ID requirement on non-Windows platforms
  - No default execution groups (i.e. to host pub/sub)

# Configuration Manager Responsibilities



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Interaction with Tools (CMP apps)
Deployment
Owner of a domain of brokers
Managing administrative security
Enforcing administrative security
Manages the pub/sub topology
Managing subscriptions
Manages the topics hierarchy

<b>In V7</b>
<b>Broker handles admin connections</b>
<b>Broker handles BAR file deployment</b>
<b>Domains concept has been removed</b>
<b>Security managed using MQ</b>
<b>Broker is Policy Enforcement Point</b>
<b>Pub/Sub managed using MQ v7 tools</b>
<b>Pub/Sub managed using MQ v7 tools</b>
<b>Pub/Sub managed using MQ v7 tools</b>

# Command-line



- Message Broker ships with commands for performing configuration and administration actions
- These complement and extend our graphical administration options
- On distributed platforms you need to apply the mqsiprofile to be able to run the commands
- On z/OS the commands are available as jobs, console commands, or both
  - During broker customization you should copy the sample jobs from the SBIPSAMP/SBIPPROC libraries to the broker's component dataset
  - The commands run by jobs are run as the user submitting the job
    - Unless a USER=<user> statement is added to the JCL
  - Console commands are run by the broker userid and are run inside the main broker started task address space

# V7 Command-line Improvements



- Existing 'ConfigMgr' commands now talk directly to the broker.
  - E.g. mqsicreateexecutiongroup, mqsistartmsgflows etc
- Consistent Specification of local vs. remote brokers
  - If the broker is local, just give its name
  - If it's remote, specify its connection parameters

BIP1121I: Creates an execution group.

Syntax:

```
mqsicreateexecutiongroup brokerSpec -e egName [-w timeoutSecs] [-v traceFileName]
```

Command options:

'**brokerSpec**' is one of:

(a) 'brokerName' : Name of a locally defined broker  
(b) '-n brokerFileName' : File containing remote broker connection parameters (\*.broker)  
(c) '-i ipAddress -p port -q qMgr' : hostname, port and queue manager of a remote broker

'-e egName' name of the new execution group

'-w timeoutSecs' maximum number of seconds to wait for the execution group to be created

'-v traceFileName' send verbose internal trace to the specified file.

# V7 Command Changes - Example



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```
mgsideploy -i LUCAS -p 1414 -q QMGR -b BROKER -e EG1 -a MYBAR.bar
```

- V6.x meaning:
  - Connect to the Configuration Manager on queue manager 'QMGR', which is listening on port 1414 of machine LUCAS.
  - Deploy 'MYBAR.bar' to the execution group 'EG1' on broker 'BROKER'.
- V7 meaning:
  - Connect to the broker on queue manager 'QMGR', which is listening on port 1414 of machine LUCAS.
  - Deploy 'MYBAR.bar' to the execution group 'EG1'.
  - The -b parameter is ignored, and may or may not match the actual name of the broker.

# Other V7 Command-line Improvements



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- **mqsilist**
  - Displays detailed information about deployed resources via `-d` option
  - New recursive option
  - Works with remote brokers

```
BIP1288I: Message flow 'simpleflow' on execution group 'ello' is running.
Additional thread instances: '0'
Deployed: '24/07/09 16:37' in Bar file 'C:\My Documents\BAR Files\test.bar'
Last edited: '08/08/07 17:42'
User-defined property names:
Keywords:
  Author = 'Matt'
  Information = 'This flow simply removes messages from SYSTEM.DEFAULT.LOCAL.QUEUE'
  Usage = 'This usage is buried inside the CMF' VERSION = 'v1.1'
```

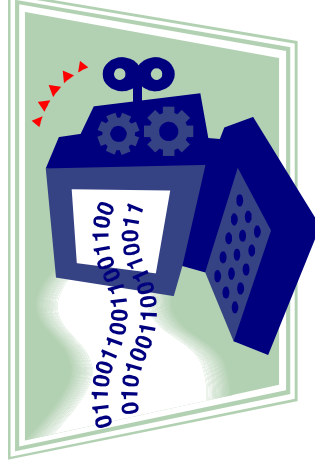
- **mqsissetparms**
  - Takes effect without Broker restart. Execution group `mqsireload` and go!
- **mqsistartmsgflow** and **mqsistopmsgflow**
  - Can start and stop the execution group (DataFlowEngine) process
  - Control which message flows get started when an execution group starts

# Administration API (CMP API)



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- Programming interface that your applications can use to control brokers and their resources through a remote interface.
- Set of Java classes packaged as a single JAR file
- Full javadoc for the API is available in the manuals and in the broker runtime
- The API can be used to perform the following tasks
  - Deploy BAR files
  - Change the broker configuration properties
  - Create, modify, and delete execution groups
  - Inquire and set the status of the broker and its associated resources, and to be informed if status changes
  - Execution groups
  - Deployed message flows
  - Deployed files used by the message flows (for example, JAR files)
  - View the Administration log



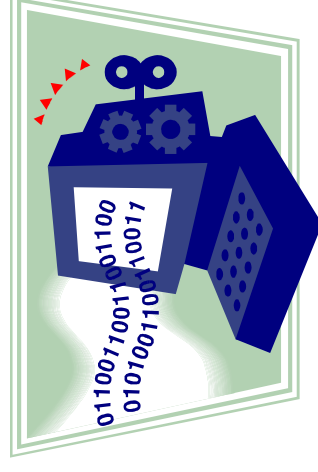
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# V7 CMP API Changes



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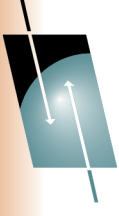
- The CMP remains the strategic interface for programmatic administration
  - Now connects directly to the broker!
- Lots more information provided
  - Local broker information
  - Node API
  - Configurable Services
  - Accounting and Statistics Information
- Support for v6.x applications
  - Old package names, class names and method signatures unaffected (although many deprecated methods)
  - Applications will compile without change
  - Applications that do operations that are relevant in v7 should continue to work
- Future
  - Move remaining mqsi commands to use CMP



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# CMP API Exerciser



The screenshot displays the CMP API Exerciser application. The interface is divided into three main sections:

- File Tree (Left):** Shows a hierarchical view of files and folders. The selected item is 'MB7BROKER', which contains a 'default' folder and several files: 'pager.bar', 'TextMessenger.cmf', 'PagerMessageSets.dictionary', 'SWIFT.bar', and 'Swift\_2002\_MT103.dictionary'. Below these are 'Administration Log', 'Administration Queue', and 'Configurable Services'.
- Table (Middle):** A table with two columns: 'BrokerProxy Method' and 'Result'. It lists various methods and their corresponding results.
- Log Window (Right):** A text area showing the application's output, including timestamps and status messages.

BrokerProxy Method	Result
getBrokerLongVersion0	S000-L91002.1
getBrokerOSArch0	x86
getBrokerOSName0	Microsoft Windows XP
getBrokerOSVersion0	5.1 build 2600 Service Pack 3
getBrokerVersion0	7000
getConfigurationObjectType0	<Broker>
getConfigurationObjectTypeOfParent0	(null)
getExecutionGroups0	<default>
[1]	
getHTTPListenerPropertyNames0	
HTTPConnector/URIEncoding	
HTTPConnector/acceptCount	
HTTPConnector/address	
HTTPConnector/allowTrace	
HTTPConnector/bufferSize	
HTTPConnector/compressableMimeTypes	
HTTPConnector/compression	
HTTPConnector/connectionLinger	

Log Window Output:

```
14:11:05 Successfully registered for updates to the log <Log>.
14:11:05 Successfully registered for <Administration Queue>.
14:11:05
14:11:05 Successfully connected. Click on an object to select it and display its properties.
14:11:05 Right-click a selected object to manipulate it.
14:11:05
14:11:05 The CMP API Exerciser is set to wait for requests to be fully completed by the broker before returning; expect pauses while the broker processes each request.
14:11:05 You can change this setting using File -> Set Timeout characteristics.
14:11:05 <---- cmp.exerciser.ClassTesterForBrokerProxy.testConnectToLocalBroker
14:11:05
```

Bottom Status Bar: Connected to broker 'MB7BROKER'.

# Administrative Security



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- Simplified administrative security in V7 allows 3 levels of authorisation for administrative actions:
  - Reading
  - Writing
  - Executing (i.e. starting and stopping)
- On two object types:
  - Broker
  - Execution Group
- Administrative Security is not enabled by default
- Access controlled using MQ queues on the broker's queue manager
- Guidance provided for migration from CM ACLs
  - Though there is not a one-to-one mapping

# Security Queues

SYSTEM.BROKER.AUTH  
SYSTEM.BROKER.AUTH.<egname>



Entity type: User  
Entity name: MyBrokerUser  
Object type: Queue  
Profile name: SYSTEM.BROKER.AUTH  
Queue manager name: MB7QMGR

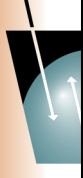
Administration  
 Change  
 Clear  
 Delete  
 Display

Context  
 Pass all context  
 Pass identity context  
 Set all context  
 Set identity context

MQI  
 Browse  
 Get  
 Inquire  
 Put  
 Set

+inq = Read  
+put = Write  
+set = Execute

# Required Task Authorizations



Tasks	Queue Names	
	SYSTEM.BROKER.AUTH	SYSTEM.BROKER.AUTH.EG
Set broker properties	R+W	
View broker properties	R	
Create or delete configurable services	R+W	
Set configurable services properties	R+W	
View configurable services properties	R	
Create or delete execution groups	R+W	
Rename execution groups	R+W	
List execution groups	R	
Start or stop execution groups	R X <sup>1</sup>	X <sup>1</sup>
Set execution group properties	R	W
View execution group properties	R	R
Start or stop resource statistics collection	R	X
Report resource statistics	R	R
Deploy	R	W
List message flows and other deployed objects	R	R
Start or stop message flows	R	X
Delete resources from an execution group	R	W

Note: X<sup>1</sup> Execute access is required on the broker or on an individual execution group  
<http://publib.boulder.ibm.com/infocenter/wmbhelp/v7r0m0/topic/com.ibm.etools.mff.doc/bp43530.htm>



# Required Command Authorizations

Command	Queue Names	
	SYSTEM.BROKER.AUTH	SYSTEM.BROKER.AUTH.EG
mqschangeresourcestats	R	X
mqsicreateexecutiongroup	R+W	
mqsideleteexecutiongroup	R+W	
mqsideploy	R	W
mqsilist	R	R <sup>1</sup>
mqsimode	R (to display) R+W (to change)	
mqsireloadsecurity	R	W
mqsiportresourcestats	R	R
mqsistartmsgflow	R	X
mqsistopmsgflow	R	X

Note: R<sup>1</sup> You require read access on any execution groups for which you wish to display information  
<http://publib.boulder.ibm.com/infocenter/wmbhelp/v7r0m0/topic/com.ibm.etools.mft.doc/bp43540.htm>

# Brokers View for Application Developers



The screenshot displays the IBM WebSphere Message Broker Toolkit interface. The main window is titled "Brokers View" and shows a tree structure of brokers and flows. The "Brokers" pane on the right lists several brokers, including "MB7BROKER", "default", "FileOutputNodeSampleExecutionGroup", "FileOutputNodeSampleFlow", "FileOutputNodeSampleJavaProject", and "ToolkitCreatedBroker". A red dashed arrow points from the "FileOutputNodeSampleFlow" entry in the tree to the "Properties" pane on the right.

The "Properties" pane shows the "Details" tab for the selected flow. It contains a log entry that is circled in red:

```
MBIP-40401: The Execution Group 'FileOutputNodeSampleExecutionGroup' has processed a co... Mon Oct 05 15:41:11...
MBIP-20561: Broker MB7BROKER successfully processed the entire internal configuration mess... Mon Oct 05 16:11:11...
```

# Message Broker Explorer (MBX)



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- New advanced broker management option designed for administrators
- Plug-in to MQ Explorer
- Extra features
  - Create/Manage Configurable Services
  - Performance Views
  - Group brokers using broker sets
  - Offload WS-Security onto Datapower
  - Administration Log
  - Administration Queue
  - Security & Policy Set editors

The screenshot displays the IBM WebSphere MQ Explorer interface. The top-left pane shows a tree view of the MQ environment, including components like Queue Managers, Channels, Client Connections, and various brokers. The top-right pane shows performance statistics for the selected broker (WBRK6\_DEFAULT\_BROKER) in a 3D bar chart format. The bottom-right pane shows an event log for the selected broker.

Label	Type	TotalElapsedTime	MaximumElapse...	MinimumElapse...	TotalCPUTime
Filter	FilterNode	89000	3000	1000	78125
MQOutput	MQOutputNode	1005000	77000	1000	15625
MQInput	MQInputNode	297000	51000	1000	0

# Administration Log



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- Administration Log in MBX shows all recent activity on the broker
  - Deployments, deletions, starts, stops, property changes etc.
  - Save/Clear log option
  - Double-click for more information

Message	Source	Timestamp	Message Detail
BIP2880I	Change Notification	09-Oct-2009 10:18:30	The property 'ComIbmJVMManager JVMMaxHeapSize' has changed from '-1' to '102385684' on object 'default' of type 'E
BIP2883I	Change Notification	09-Oct-2009 10:17:13	The resource 'TextMessenger' of type 'MessageFlow' was modified on object 'default' of type 'ExecutionGroup' with pare
BIP2880I	Change Notification	09-Oct-2009 10:17:13	The property 'object.runstate' has changed from 'running' to 'stopped' on object 'TextMessenger' of type 'MessageFlow
BIP2871I	Administration Result	09-Oct-2009 10:17:12	The request made by user 'Matt' to 'stop' the resource 'TextMessenger' of type 'MessageFlow' on parent 'default' of typ
BIP2871I	Administration Request	09-Oct-2009 10:17:10	The request made by user 'Matt' to 'stop' the resource 'TextMessenger' of type 'MessageFlow' on parent 'default' of typ
BIP2881I	Change Notification	09-Oct-2009 10:17:03	The resource 'TextMessenger' of type 'MessageFlow' was created on object 'default' of type 'ExecutionGroup' with pare
BIP2871I	Administration Result	09-Oct-2009 10:17:02	The request made by user 'Matt' to 'deploy' the resource 'C:\Documents and Settings\Matt\Application Data\IBM\MQ Ex
BIP2871I	Administration Request	09-Oct-2009 10:17:01	The request made by user 'Matt' to 'deploy' the resource 'C:\Documents and Settings\Matt\Application Data\IBM\MQ Ex
BIP2881I	Change Notification	09-Oct-2009 09:29:35	The resource 'REBZ2' of type 'dictionary' was created on object 'default' of type 'ExecutionGroup' with parent 'MB7BROK
BIP2871I	Administration Result	09-Oct-2009 09:29:34	The request made by user 'Matt' to 'deploy' the resource 'C:\Documents and Settings\Matt\My Documents\BAR Files\ms
BIP2871I	Administration Request	09-Oct-2009 09:29:30	The request made by user 'Matt' to 'deploy' the resource 'C:\Documents and Settings\Matt\My Documents\BAR Files\ms
BIP2882I	Change Notification	09-Oct-2009 09:29:19	The resource 'TextMessenger' of type 'MessageFlow' was deleted from object 'default' of type 'ExecutionGroup' with pa
BIP2871I	Administration Result	09-Oct-2009 09:29:17	The request made by user 'Matt' to 'deploy' the resource " of type 'BAR' on parent 'default' of type 'ExecutionGroup' has
BIP2871I	Administration Demand	09-Oct-2009 09:29:16	The request made by user 'Matt' to 'deploy' the resource " of type 'BAR' on parent 'default' of type 'ExecutionGroup' has

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# Administration Queue



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- The broker can now process administration requests concurrently
- Use the MBX Administration Queue to view all outstanding administration requests
- Administrator can select individual pending items and cancel them if necessary

MQ Explorer - Content

## Administration Queue

Administration Queue QuickView:

Order	Status	Username	Operation Type	Object Name	Object Type	Creation Time	Elapsed ...	Identifier
1	submitted	Matt	stop	foo	Execution Group	15-Sep-2009 11:55:50	0	DM9715bd43-k
2	pending	Matt	deletechild	default	Execution Group	15-Sep-2009 11:57:46	0	DMe666acfe-c
3	pending	Matt	deploy	foo	Execution Group	15-Sep-2009 11:58:57	3	DM1942c375-z
4	pending	Matt	deploy	foo	Execution Group	15-Sep-2009 11:59:55	1	DM1a81e52f-c

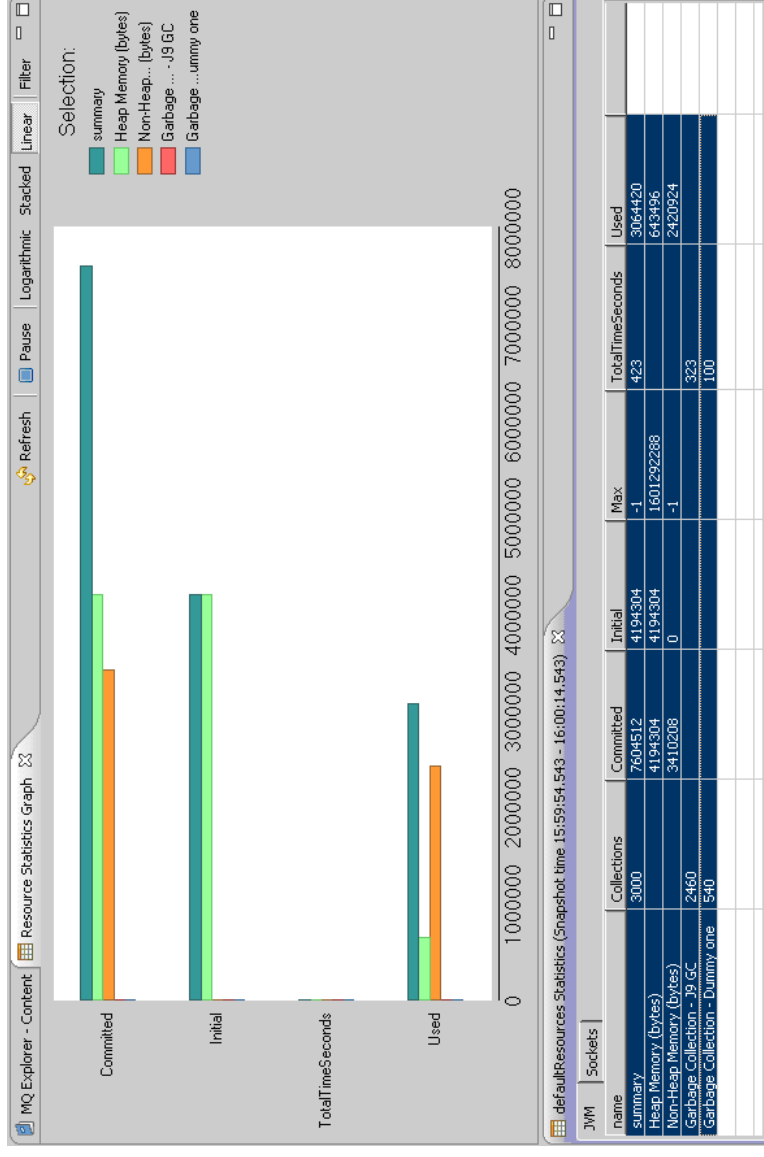
# Resource Statistics

- Find out the current resource usage of a broker or execution group
- **CICS** – successful requests, failures, security failures...
- **CORBA** – Invocations, Success, Failures
- **FTE** – Inbound/Outbound transfers, bytes sent/received...
- **JDBC** – Requests, Cached requests, Providers...
- **JVM** – Memory used, thread count, heap statistics...
- **ODBC** – Connections, Closures, Errors, Successes
- **SOAPInput** – Inbound messages, Replies, Failures, Policy Sets
- **Security** – Operations, Success, Failures, Cache usage...
- **Sockets** – Total sockets, message sizes, Kb sent/received
- **Parsers** – Memory usage; message elements created/deleted; parser count

- More resource types being added in the future



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# Resource Statistics XML



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- Based on existing accounting and statistics framework
- Sample XML published to  
`$SYS/Broker/<broker>/ResourceStatistics/<eg>` :

```
<ResourceStatistics brokerLabel="STRESS1" brokerUUID="1e9e4ba1-828a-4f91-ab87-742306e94e5b" executionGroupName="eg.EAS.SOCKET.1" executionGroupUUID="15cccf2f-2401-0000-0080-8e68043b2073" startDate="2009-10-08" startTime="10:29:26.198" endDate="2009-10-08" endTime="10:29:46.270">
  <ResourceType name="Sockets">
    <resourceIdentifier name="summary" TotalMessages="854" MinimumMessagesPerMinute="1179" MaximumMessagesPerMinute="1383" AverageMessagesPerMinute="5328" TotalBytesSent="1066547" MinimumBytesSentPerSecond="11571" MaximumBytesSentPerSecond="41756" AverageBytesSentPerSecond="42334" TotalBytesReceived="282958" MinimumBytesReceivedPerSecond="2692" MaximumBytesReceivedPerSecond="11455" AverageBytesReceivedPerSecond="3264" MinimumBytesReceivedPerMessage="835627" MaximumBytesReceivedPerMessage="835627" AverageBytesReceivedPerMessage="2506881" MinimumBytesReceivedPerMessage="54338" MaximumBytesReceivedPerMessage="54338" AverageBytesReceivedPerMessage="163014"/>
    <resourceIdentifier name="localhost.7800" TotalMessages="461" MinimumMessagesPerMinute="1383" MaximumMessagesPerMinute="1383" AverageMessagesPerMinute="231422" MinimumBytesSentPerSecond="11571" MaximumBytesSentPerSecond="11571" TotalBytesSent="231422" MinimumBytesSentPerSecond="11571" MaximumBytesReceivedPerSecond="11455" AverageBytesReceivedPerSecond="11455" TotalBytesReceived="229117" MinimumBytesReceivedPerMessage="502" MaximumBytesReceivedPerMessage="502" AverageBytesReceivedPerMessage="497" MinimumBytesReceivedPerMessage="497"/>
    <resourceIdentifier name="localhost.7900" TotalMessages="393" MinimumMessagesPerMinute="1179" MaximumMessagesPerMinute="1179" AverageMessagesPerMinute="835125" MinimumBytesSentPerSecond="41756" MaximumBytesSentPerSecond="41756" TotalBytesSent="835125" MinimumBytesReceivedPerSecond="53841" MinimumBytesReceivedPerSecond="2692" MaximumBytesReceivedPerSecond="2692" AverageBytesReceivedPerSecond="2692" MinimumBytesReceivedPerMessage="2125" MaximumBytesReceivedPerMessage="2125" AverageBytesReceivedPerMessage="137" MinimumBytesReceivedPerMessage="137"/>
  </ResourceType>
</ResourceStatistics>
```

# V7 Database removal



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- The broker no longer uses a system database
  - Configuration is now stored exclusively on the filesystem
  - WMB does not ship with a database product
  - User database access unaffected
- Additionally, the Windows registry is no longer used to hold configuration information
- New *mqsibackupbroker* and *mqsirestorebroker* commands to backup and restore (for DR)
- Migration will copy any system database and registry configuration to the filesystem

# Database removal - Userids

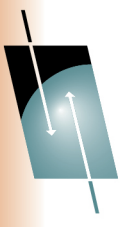


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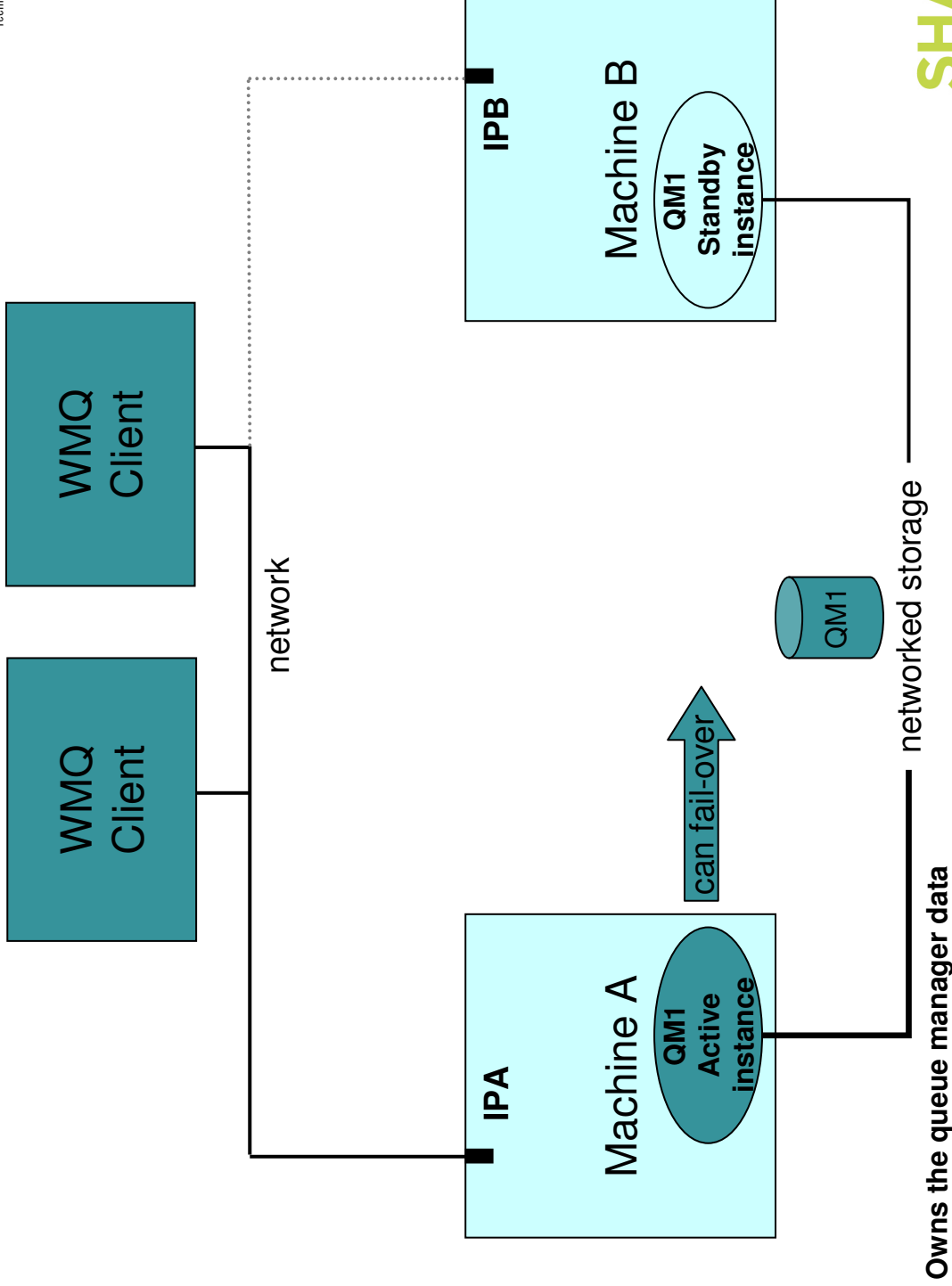
- Database UserID and Password
  - No longer used on *mqsicreatebroker* – flags ignored
  - Use *mqsisetdbparms* to control default ODBC and JDBC access control
  - Any v6.x defaults are migrated
- Service UserID and Password
  - No longer used on non-Windows platforms
  - Still required on Windows, but can now specify LocalSystem
- The userid that starts the broker no longer requires *mqm* authority



# MQ HA Overview – Initial State



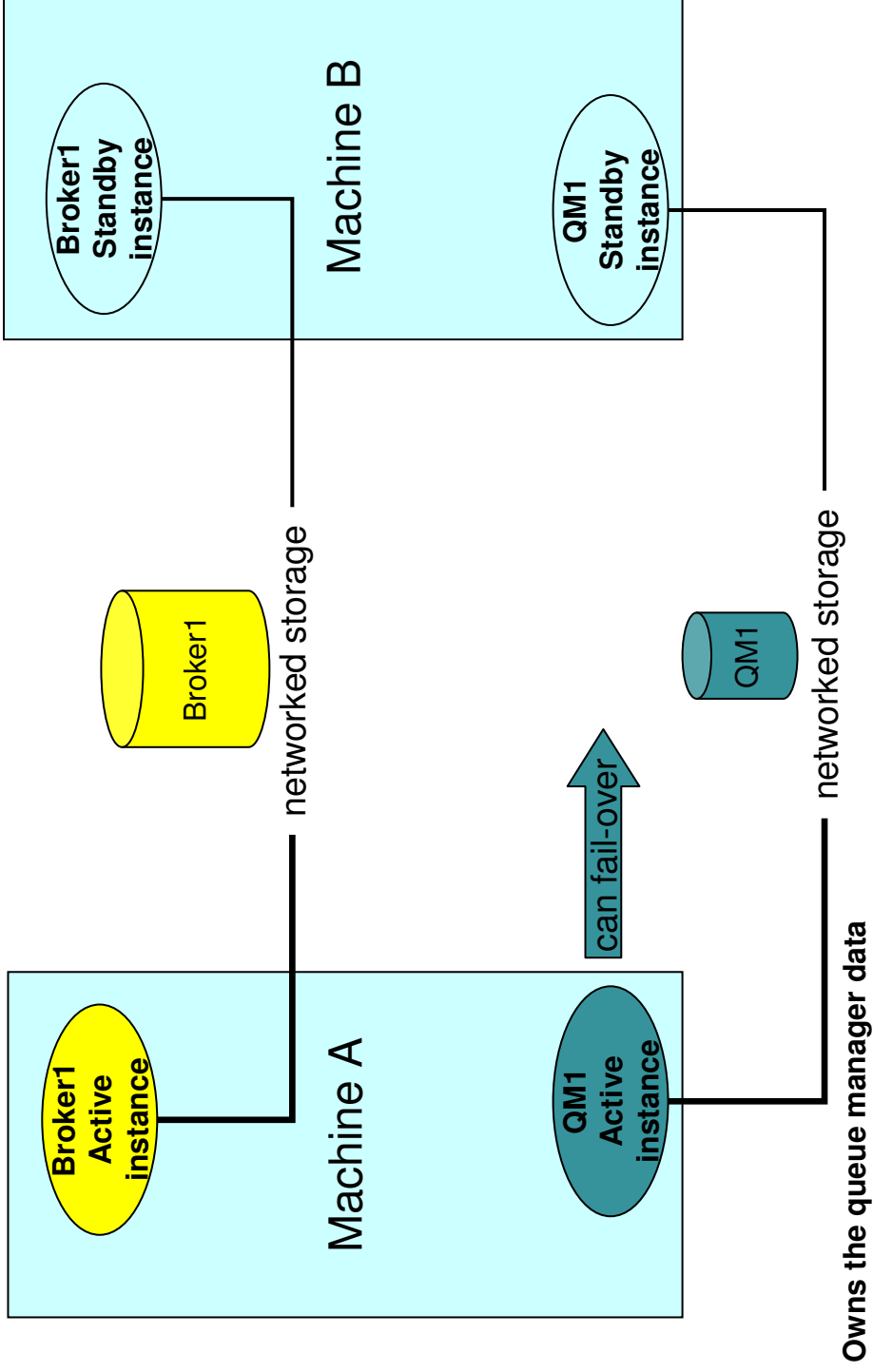
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# Message Broker - Standalone



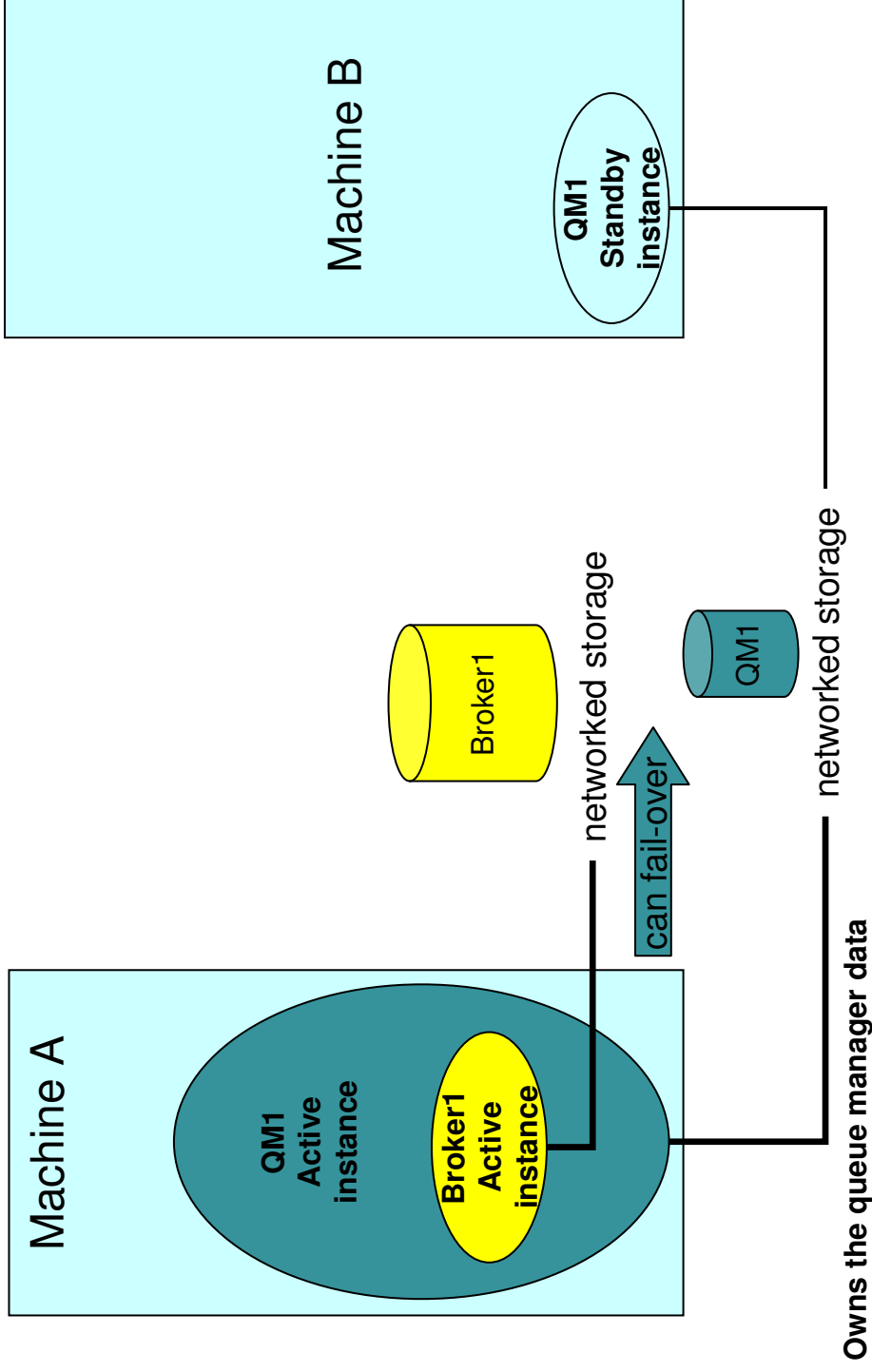
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# Message Broker – As a Service

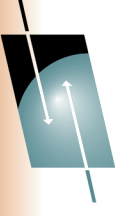


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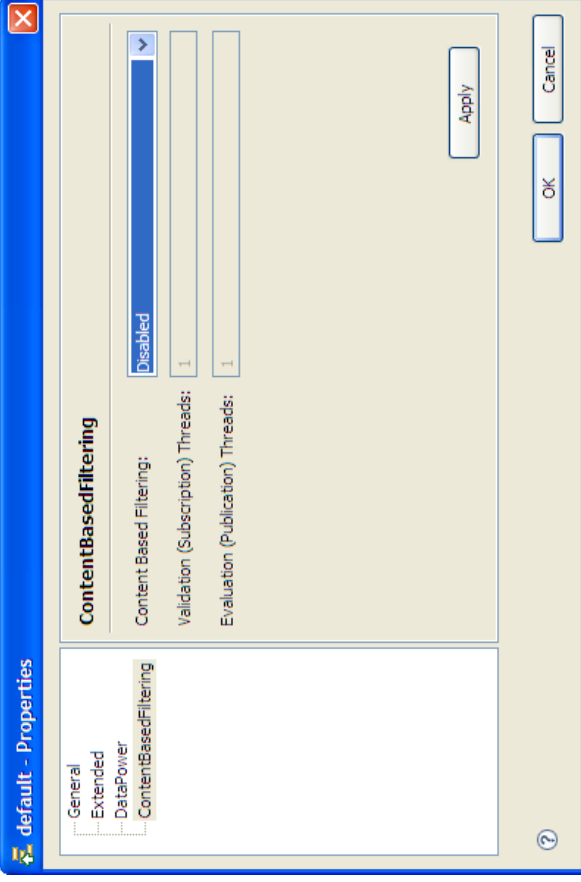
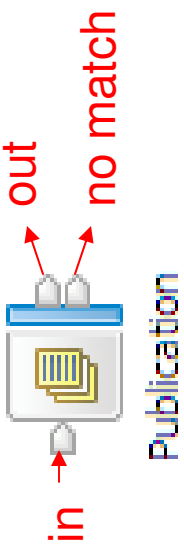


# Publish Subscribe



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- WMB V7 uses WMQ 7.0.1 as its pub/sub engine
  - Common topic space
  - Publication node uses WMQ
  - Content-based pub/sub handled by WMB
    - For example, `<publish>` if `msg.price > 100`
  - New 'noMatch' terminal when no subscribers



- Default Execution Group
  - Used in v6.x to handle pub/sub engine
  - No default execution group in v7
  - Configure which execution groups (if any) you would like to handle content-based filters

# Per Execution Group Profiles (7.0.0.2)



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- Extend or change the environment for a specific execution group
- Distributed
  - Add a script (or scripts) to the appropriate directory
    - Windows:  
%MQSI\_WORKPATH%\config\<my\_broker\_name>\<my\_eg\_label>\profiles
    - Linux & Unix  
\$MQSI\_WORKPATH/config/<my\_broker\_name>/<my\_eg\_label>/profiles
  - Scripts are run after mqsiprofile and any scripts in the common/profiles directory are run
- z/OS
  - Customize BIPPROF as normal for all execution group parameters
  - Copy and customize BIPEPROF for each appropriate execution group
  - Edit BIPGEN adding an additional step for each new BIPEPROF
  - Submit BIPGEN
    - ENVFILE & ENVFILE.<eg name> generated in broker's home directory

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# Migrating to V7



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- Message Broker V7 supports coexistence
  - Install v7 alongside your previous version
  - However, must use V7 tools for v7 brokers, v6.x tools for v6.x brokers/ConfigMgrs
- Before migration
  - Move to WebSphere MQ V7.0.1
  - If you want to use Pub/Sub, run *migmbbrk*
- Migration
  - Direct migration (*mqsimigratecomponents*) supported from V6 and V6.1
  - Rollback option available (any post-migration configuration changes not reflected)
  - Load up existing artefacts in the V7 toolkit
- After migration
  - Graphical tools automatically show local brokers
  - If you wish to manage remote brokers, connect to them (IP/Port/QMgr)
  - Remove CM and DB if no longer required

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# Configurable Services



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- Allows separation of flow design from the details about external services
  - eg: SMTP server or a JMS provider
- Flow developer configures nodes with the configurable service names
- Broker administrator creates and configures the configurable service with appropriate values
- Restart the execution group for changes to take effect
- Configure using Message Broker Explorer or using the commands
  - `mqsicreateconfigurableservice` – create a new configurable service
    - `mqsicreateconfigurableservice <brokerName> -c <cs name> -o <cs name>`
    - `mqsicreateconfigurableservice <brokerName> -c <cs name> -o <cs name> -n <property>, <property2> -v <value>, value2>`
  - `mqschangeproperties` – change an existing configurable service
    - `mqschangeproperties <brokerName> -c <cs type> -o <cs name> -n <property> -v <value>`
  - `mqsiexportproperties` – report available configurable services and their attributes
    - `mqsiexportproperties <brokerName> -c <cs type> -o <cs name> -f`
  - `mqsideleteconfigurableservice` – delete a configurable service
    - `mqsideleteconfigurableservice <brokerName> -c <cs name> -o <cs name>`

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# Configurable Services



- Extensive list available
  - Aggregation
  - CICSCONNECTION
  - Collector
  - CORBA
  - EmailServer
  - EISProviders
  - FtpServer
  - IMSCONNECT
  - JavaClassLoader
  - JDBCProviders
  - JDEdwardsConnection
  - JMSPROVIDERS
  - MonitoringProfiles
  - PeopleSoftConnection
  - PolicySets
  - PolicySet Bindings
  - Resequenece
  - SAPConnection
  - SecurityProfiles
  - Service Registries
  - SiebelConnection
  - SMTP
  - TCPIPClient
  - TCPIPServer
  - Timer
  - UserDefined

**IMS Request Node Properties - IMS Request**

Hostname : A value must be set for this property.

Use connection properties defined on node

Hostname *	
Port number*	0
Data store name*	
Timeout waiting for a transaction to be executed (seconds)*	60
Configurable service*	
Security identity	

# Configurable Services - example



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```
mqsicreateconfigurableservice MB7BROKER -c JDBCProviders -o DB2EXTRA -n connectionUriFormat  
-v "jdbc:db2://[serverName]:[portNumber]/[databaseName]:user=[user];password=[password];"
```

```
mqsichangeproperties MB7BROKER -c JDBCProviders -o DB2EXTRA -n maxConnectionPoolSize -v 20
```

```
mqsireportproperties MB7BROKER -c JDBCProviders -o DB2EXTRA -r
```

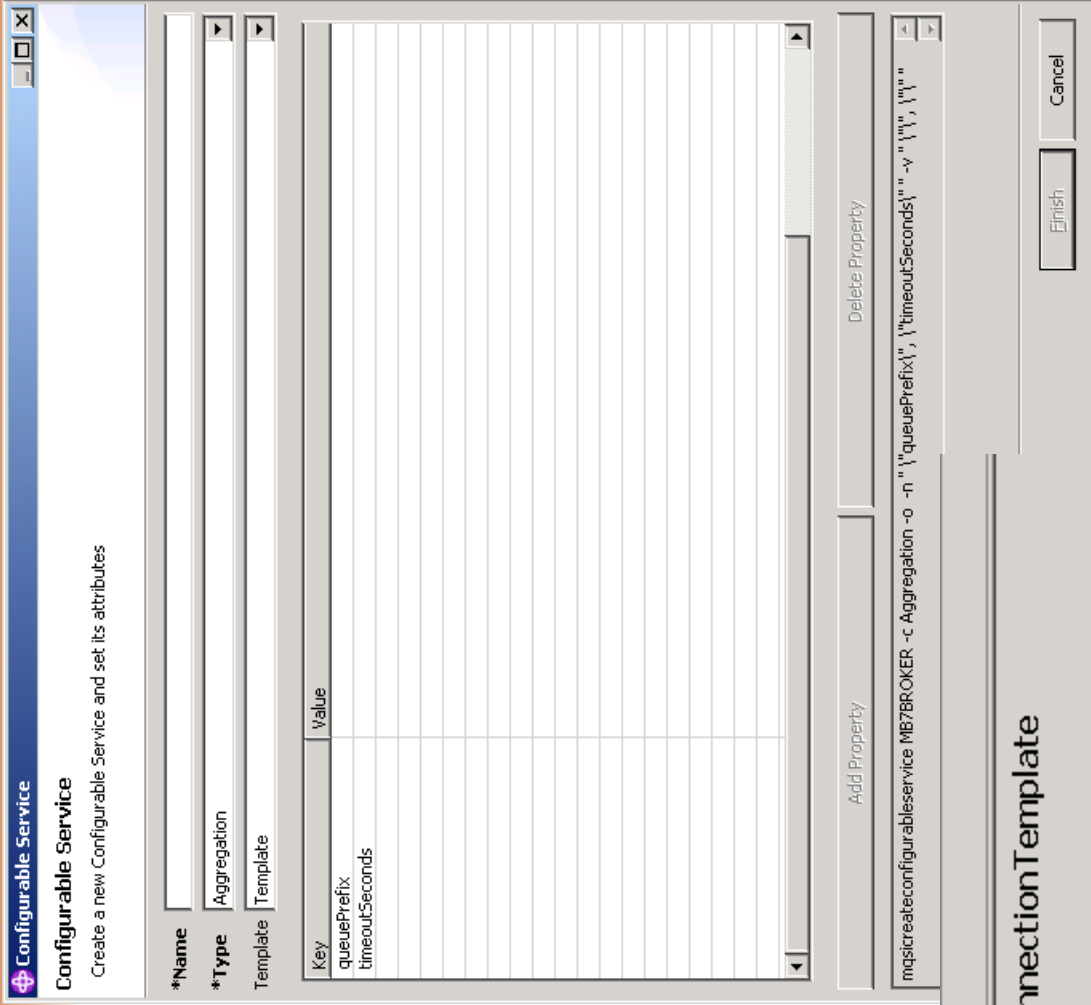
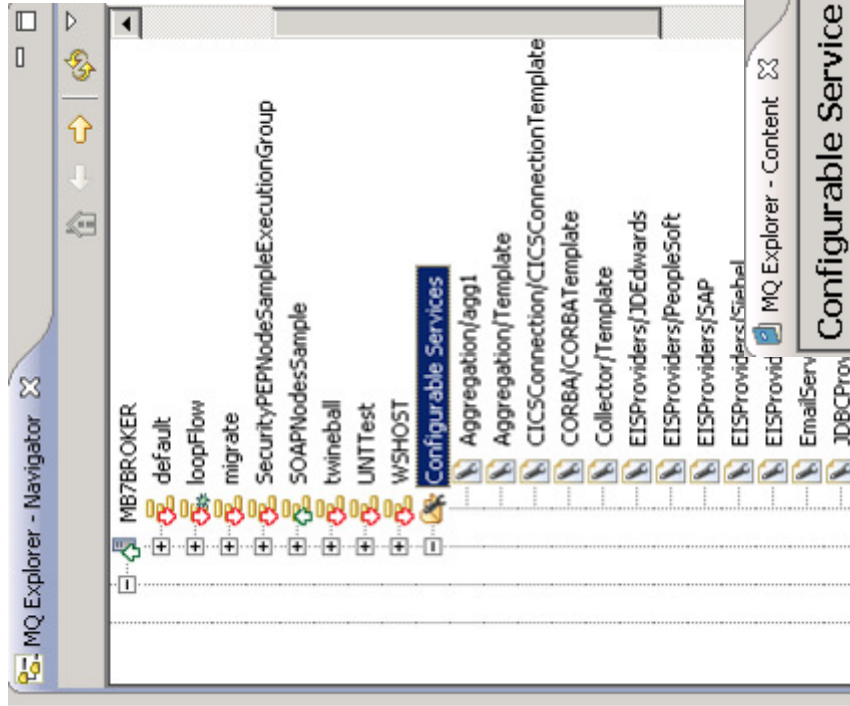
```
JDBCProviders  
DB2EXTRA  
connectionUriFormat='jdbc:db2://[serverName]:[portNumber]/[databaseName]:user=[user];password=[password];'  
connectionUriFormatAttr1=""  
connectionUriFormatAttr2=""  
connectionUriFormatAttr3=""  
connectionUriFormatAttr4=""  
connectionUriFormatAttr5=""  
databaseName='default_Database_Name'  
databaseType='default_Database_Type'  
databaseVersion='default_Database_Version'  
description='default_Description'  
environmentParams='default_none'  
jarsURL='default_Path'  
maxConnectionPoolSize='20'  
portNumber='default_Port_Number'  
securityIdentity='default_User@default_Server'  
serverName='default_Database_Server_Name'  
type4DataSourceClassName='default_Type_Four_Datasource_Class_Name'  
type4DriverClassName='default_Type_Four_Driver_Class_Name'
```

BIP8071: Successful command completion.

```
mqsideleteconfigurableservice MB7BROKER -c JDBCProviders -o DB2EXTRA
```

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# Configurable Services



## Configurable Service CICSCONNECTIONTemplate

Properties QuickView:

Name	CICSCONNECTIONTemplate
Type	CICSCONNECTION
cicsServer	
clientApplid	
clientQualifier	
connectionTimeoutSecs	30
gatewayURL	local:
requestTimeoutSecs	120
securityIdentity	



## Local Error Logs

- Key information point for an administrator to monitor
- Message Broker components use the local error log to record information about major activities
- Actual local error logs vary by platform
  - Windows – Windows Event Log (Application View)
  - Unix/Linux – syslog
  - z/OS – JOBLLOG & system console log
- When an error occurs, check the local error log first
- Often requested by support
  - Windows
    - The event log fills up so check the size is sufficient or that circular logging is enabled
  - Unix/Linux
    - Make sure you configure the syslog daemon



# stdout/stderr



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- Useful place to look for errors / debugging
  - Always worth checking for exceptions if problems are occurring
- Each major component redirects its stdout/stderr streams to files
  - Windows
    - *Admin Agent (7.0.0.2)*  
C:\Documents and Settings\All Users\Application Data\IBM\MQS\components\  
<brkName>\console.txt
    - *Execution group*  
C:\Documents and Settings\All Users\Application Data\IBM\MQS\components\  
<brkName>\<egUUID>\console.txt
  - Linux/Unix
    - *Admin Agent (7.0.0.2)*  
/var/mqsi/components/<brkName>/stdout & stderr
    - *Execution group*  
/var/mqsi/components/<brkName>/<egUUID>/stdout & stderr
  - z/OS
    - *STDOUT / STDERR DD cards in the joblog for both the main broker address space and for any execution groups*
- Can be useful for flow developers who use Java and code system.out.println statements for debugging

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# Coredump



- In the unlikely event that Message Broker encounters a problem that results in a coredump you need to be aware of where to look for dumps
  - Windows
    - BIP2111 error message (message broker internal error).
    - The error message contains the path to the MiniDump file in your errors directory
  - Linux/UNIX
    - BIP2060 error message (execution group terminated unexpectedly)
    - Look in the directory where the broker was started, or in the service user ID's home directory, to find the core dump file
  - Check your ulimits
    - We recommend an unlimited hard & soft limit for corefile size
    - Ensure you have enough disk space

# SVC dump (z/OS)



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- Message Broker on z/OS should always produce an SVC dump
- Dump dataset is written based on the system defined setup
  - Use the “display dump” command to display the naming options
  - BIP2060 error message (execution group ended unexpectedly) from the main Broker Address Space.
  - Message should be accompanied by one of the following messages and dump
    - *IEF450I message in the syslog, or component's joblog, showing an abend code followed by a reason code, for example:*
- In extreme cases you may see a coredump instead
  - In these cases you will see an IEA993I message in the syslog
  - Look in the started task user's directory for the coredump.pid file, as specified in the syslog:

```
IEF450I MQ83BRK DEFAULT - ABEND=S2C1 U0000 REASON=000000C4
```

- *Look in the system's dump dataset hlq for the dump dataset, or search the syslog for the appropriate IEA611I message to find out the dump dataset name.*

```
IEA993I SYSMDUMP TAKEN TO coredump.00500319
```

- If a dump is not produced then look for a reason why in the JOBLOG and system console log
  - Check both as errors are not always repeated
  - A dump might have been suppressed by DAE

# Summary

- V7 is a significant release
- Many improvements for the administrator
  - No Configuration Manager
  - Message Broker Explorer
  - Administration Queue
  - Administration Log
  - Resource Statistics
  - No system database
  - Multi-instance Brokers (HA)
  - Publish/subscribe converged with WMQ
- Expect lots more to come!
- Remember existing administration options
- If you encounter problems always remember to look in the logs



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