

IBM Integration Bus

Embedded Global Cache with WebSphere eXtreme Scale

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Hands-on lab built at product code level Version 9.0.0.0

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1. Introduction to Global Cache

WebSphere Message Broker V8.0.0.1 (fix pack 1), provided a new feature called Global Cache. IBM WebSphere Message Broker V8.0.0.2 (fix pack 2) further extended this feature to provide an automatic data revocation feature. IBM Integration Bus V9.0.0.0 provides these features without the need to activate them using the mgsichangebroker command.

Global Cache allows a number of Integration Nodes to be integrated for workload balancing. Global Cache provides the ability to have a cache storing information about the requester which would later be used to correlate the replies correctly. Using Global cache gives the flexibility for different Integration Nodes to handle the request and reply parts of an application. Using a global cache allows you to scale up the number of clients, while maintaining predictable response time for each client.

Global Cache uses an embedded version of WebSphere eXtreme Scale, and provides the following functions:

- 'Elastic' In-Memory Data Grid managing itself to scale out, scale in, failover, failure etc.
- Virtualizes free memory within a grid of Java Virtual machines (JVMs) into a single logical space which is accessible as a partitioned, key addressable space for use by applications
- Provides fault tolerance through replication with self-monitoring and healing
- The space can be scaled out by adding more JVMs while its running without restarting
- Provides a predictable scaling option
- Access to external WebSphere Xtreme Scale data grids

IBM Integration Bus Version 9.0.0.0 contains support for:

1) An embedded WebSphere eXtreme Scale (WXS) grid which can be used as a global cache from within message flows.

WXS components are hosted within Integration Server processes and operate with no requirement for additional configuration. The default scope of one cache is across one Integration node (i.e. multiple Integration Servers) but it can be extended to be across multiple Integration nodes.

2) Access to WebSphere Xtreme Scale Grids that are running outside of the Integration Node for example of a DataPower XC10 machine.

IBM Integration node support of external WebSphere Extreme Scale grids is covered under the Lab Guide "Global Cache Using DataPower XC10 Appliance" from the same series of Lab Guides.

1.1 Scenario

The following schematic shows the system context of the Global Cache Lab.



There are three message flows in this scenario:

1. **Request** – this flow receives messages on the GLOBAL.CACHE.IN queue. The application that puts messages on this queue also specifies the ultimate reply queue, which will be set to GLOBAL.CACHE.OUT in this example. Note that there are two instances of this reply queue, one on each of the queue managers. (This has been done for simplicity of demonstration, rather than creating a full MQ clustering scenario).

The Request message flow takes the MessageID and ReplyQ from the incoming message, and stores them in the embedded Global Cache. This is so that the Response message flow will be able to use this data to send the reply back to the specified reply queue, even though Response may be running in a different Integration Server, or Integration Node.

The Request flow has a user-defined property, which specifies the name of the MQ queue that the retrieveCustomer flow will send the resulting message to. This value is used to populate the ReplyQ that will be used by retrieveCustomer. This has been done for ease of illustration of the Global Caching component, when switching the demo between multiple Integration Servers and multiple Integration Nodes.

 retrieveCustomer – this flow takes the input message (passed by Request) and uses the data to retrieve a customer record from the CUSTOMER database. This is done with a simple Compute node. It then sends the output message to the specified Reply queue. Depending on the user-defined property in Request, this can be a local queue or a remote queue (where the message will be sent to IB9QMGR2). 3. **Response** – this flow runs in both Integration Nodes, and reads the GLOBAL.CACHE.RESPONSE.IN queue. It uses the MessageID to retrieve the required final reply queue name from the global cache, and sends the message to the final output queue.

1.2 Lab preparation

In the pre-built vmware, all this section has been done for you.

To run this lab, unzip the supplied file global_cache.zip into the directory c:\student directory. This will create a subdirectory called \global_cache with several further subdirectories.

Create the MQ resources

In the c:\student\global_cache\install folder, run the command createCacheQueues.bat.

This batch script also creates a second queue manager IB9QMGR2 and second Integration Node, IB9NODE2, as well as the resources used for the default IIB queue manager to communicate with the second queue manager.

Create the databases

In an Integration Command Console, go the folder c:\student\global_cache\install.

Issue the commands:

CreateRegularDB CreateRegularTables SetBrokerSecurityForCaching mqsistop IB9NODE mqsistop IB9NODE2 mqsistart IB9NODE mqsistart IB9NODE2

2. Set the default global cache policy for IB9NODE

By default the embedded global cache component is disabled. To enable it, a "Cache Policy" needs to be set. The default cache policy creates a default topology of cache components in a single Integration node.

The default port range used by the default Integration Node for the embedded eXtreme Scale component is 2800-2819. In the event that this port range conflicts with any other applications, you can change this port range using the IB9QMGR.

In the case of the pre-built system which includes WAS and Information Server, this is necessary to avoid a port conflict.

1.	In Integration Explorer, select IB9NODE.					
	Right-click IB9NODE, and select Properties. Select Global Cache.					
2.	Set Cache policy to "Default - single integration node cache managed by the integration node".					
	Change the port range to "3840-3859".					
	Set the Listener host name to "BETAWORKS-ESB01".					
	Click Apply , then OK .					
	BH WebSphere HQ Explorer (Installation) File Edit Window Help Image: Clusters Queue Managers Window Repoluce Wasspread Image: Clusters Managed File Transfer Image: Clusters Image: Clusters <					
0	Ctop and vastart the Intervation Nede					
3.	Stop and restart the integration Node.					

3. Import the application

The application that you will use to investigate the Global Cache is provided for you. In this section, you will import the application, and investigate certain aspects of the flow logic.

In the Integration Toolkit, import the Project Interchange file c:\ student \ global_cache \ resources \ WXS_Start.zip					
Explore the items have been defined in the Application Development navigator.					
Things to note: There are three applications, each containing one message flow. The applications have been organized in this way in order that each application (and therefore message flow) can be deployed independently to separate Integration Servers, or to separate Integration Nodes. This is important for this particular global cache scenario.					
The WXS_Request and WSX_Response applications have a reference to the WXSJava_Lib library.					
The WXSJava_Lib library contains two java compute nodes, which are responsible for writing information to the cache, and for reading from it.					
The WXS_Customer application has no reference. The retrieveCustomer message flow is independent, and uses a simple Compute node to read a DB2 database.					
Application Dev X Patterns Explor					

3.1 Review the WXS_Request application

3.	Open the Request message flow:					
	This message flow reads an MQ message from queue GLOBAL.CACHE.IN, and uses a java compute node to store the MQ MessageID and Reply Queue Name (required to correlate the final MQ response message) into the cache.					
	The message is then sent to the retrieveCustomer message flow by writing it to the GLOBAL.CACHE.CUSTOMER.IN queue.					
	E Request.msgflow					
	Image: Scale Image: Scale					
	Graph User Defined Properties					
	Properties Problems Deployment Log					
	Se Java Compute Node Properties - Save to Cache					
	Description					
	Basic Java class* SaveToCache					
	Monitoring Java classloader service <specify a="" configurable="" javaclassloader="" service=""></specify>					

4.	In the flow editor, click "User of	defined proper	ties".				
	You will see that this flow has a user-defined property called ResponseQueue. This UDP is used to determine whether the output from the retrieveCustomer flow is sent to a local queue, or to a remote queue (for the purpose of demonstrating caching across multiple Integration Nodes). The default value is GLOBAL.CACHE.RESPONSE.IN, which is a local MQ queue.						
	🕫 Request.msgflow 🕺						
	User Defined Properties	6					
	User Property Hierarchy	Details					
		View and edit	the item selected in the property hierarchy.				
	🖻 🔠 Request	Туре	String				
		Default Value	GLOBAL.CACHE.RESPONSE.IN				
		Mandatory	,				
	Graph User Defined Properties						
	Properties 🔀 🔒 Problems 🏛	Deployment Log	et 🖓 🗖				
	Default Values for Message	Flow Propertie	s - Request				
	Description						
	Caching ResponseQueue GL	OBAL.CACHE.RESPO	DNSE.IN				
	Monitoring						
	In the multiple Integration nod in a barfile, avoiding the need remote queue definition, so th (IB9QMGR2), with the Respon	le scenario, th to make any o le reply messa nse message	is value will be overridden by changing the value changes to the java code. It will be changed to a uge will be sent to a different queue manager flow running in a different Integration Node.				
	When finished, switch back to	the Graph vie	?W.				

5.	Double-click on the SaveToCache Compute node to see how the Java logic writes information to the cache. There are three key sections of java code:				
6.	<pre>This section of code retrieves the MQ Msgld and ReplyQ from the MQMD: // Get the original MsgId and ReplyToQ of the incoming request MbElement rootEl = outAssembly.getMessage().getRootElement(); MbElement replyToQEl = rootEl.getFirstElementByPath("/MQMD/ReplyToQ"); String replyToQ = replyToQE1.getValueAsString(); MbElement msgIdEl= rootEl.getFirstElementByPath("/MQMD/MsgId"); String msgId = msgIdEl.getValueAsString();</pre>				
7.	 The following sections of code save the message and replyToQ information in the (embedded) global cache to a range of different maps. Note: a) When writing data to the cache a <key><value> pair is written, in this example message ID is used for the key – a "duplicate Key" condition is raised if you attempt to write a key that already exists.</value></key> b) MbGlobalMapSessionPolicy can be used before writing data to a map to define how long entries will exist in the map before they are automatically deleted: 				
8.	<pre>/* * We're about to overwrite the original ReplyToQ of this message. * So, write it to the global cache it for safe keeping. This will * be used subsequently by the Response message flow to send the * response back to the original reply queue. * */ /* * Map 1 - "aliveUntilRestart" * write data to a map that will preserve the data until the IB node * restarts ie no explicit data eviction policy - default is to keep * the data until restart of IB node. * */ MbGlobalMap globalMap=MbGlobalMap.getGlobalMap("aliveUntilRestart");</pre>				
9.	<pre>globalMap.put(msgId, replyToQ); /* * Map 2 "aliveFor60Seconds" * Write data to a map that will automatically expire after * 60 seconds. The retrieveFromCache code will use this map to * restore the replyToQ */</pre>				
	MbGlobalMap LiveFor60=MbGlobalMap.getGlobalMap("aliveFor60Seconds", new MbGlobalMapSessionPolicy(60)); LiveFor60.put(msgId, replyToQ);				

10.	<pre>/* * Map 3 "aliveFor120Seconds" * Write data to a map that will automatically expire after 120 * seconds */</pre>
	<pre>MbGlobalMap LiveFor120= MbGlobalMap.getGlobalMap("aliveFor120Seconds", new MbGlobalMapSessionPolicy(120)); LiveFor120.put(msgId, replyToQ);</pre>
11.	Finally, this section of code reads the value of a user-defined property "ResponseQueue". The value of this user-defined property determines whether the reply queue of the retrieveCustomer flow will be a local or remote queue.
	<pre>responseQueue = getUserDefinedAttribute("ResponseQueue").toString();</pre>
	<pre>outMessage.getRootElement().getFirstElementByPath("/MQMD/ReplyToQ"). setValue(responseQueue + instance);</pre>
12.	Close the java editor when finished (without saving any changes), and close the Request message flow.

3.2 Review the WXS_Customer application

13	Now open the retrieveCustomer message flow					
10.	Now open the rethevecustomer message now.					
	On the MQ Input node, the Message Parsing domain has been set to XMLNSC. This is because the flow needs access to the input data (CustomerID) to retrieve a record from the CUSTOMER table.					
RetrieveCustomer.msgflow						
	WebSphere MQ					
	Gms JMS					
	Web Services (GLOBAL.CACHE.CUSTOMER.IN) getCustomer MQ Reply					
	WebSobere Adapters					
	Graph User Defined Properties					
	Properties 🕱 🔝 Problems 🖽 Deployment Log					
	MQ Input Node Properties - GLOBAL.CACHE.CUSTOMER.IN					
	Description					
	Basic Message domain XMLNSC : For XML messages (namespace aware, validation, low memory use)					
	Input Message Parsing Message model Leave blank to use XML schema in a Library or the Application, or f Browse					
	Advanced Message					
14.	Open the getCustomer Compute node. The ESQL code will retrieve a row from the					
	CUSTOMER table, putting it temporarily in Environment. Variables.					
	The FirstName and LastName fields are then stored in the output message					
	The First value and Last value notes are then stored in the output message.					
	BEGIN					
	SET OutputRoot = InputRoot;					
	SET OutputRoot.XMLNSC.CUSTOMER = NULL;					
	populate the environment with passenger into from the database SET Environment.Variables =					
	THE (SELECT T.* FROM <u>Database.CUSTOMER</u> AS T					
	WHERE <u>T.CUSTOMERID</u> = InputRoot.XMLNSC.CUSTOMER.CUSTOMERID);					
	populate the output message with info from the database query CREATE FIELD OutputRoot.XMLNSC.CUSTOMER;					
	DECLARE OUTPASS REFERENCE TO OUTPUTROOT.XMLNSC.CUSTOMER; SET outpass.FirstName = Environment.Variables.FIRSTNAME:					
	SET outpass.LastName = Environment.Variables.LASTNAME;					
	RETURN TRUE;					
	Close the ESQL editor.					
1						

3.3 Review the WXS_Response application

15.	Now open the Response message flow.							
	First, note that the MQ input node reads the queue GLOBAL.CACHE.RESPONSE.IN. This queue exists in both IB9QMGR and IB9QMGR2, so the flow can execute in either of the integration nodes.							
	BB Response.msgflow 83							
	Cosputerioning Palette Palette Palette Palette Palette Properties Craph User Defined Properties							
	Description							
	Basic Java class* RetrieveFromCache Validation Image: Compared and the second and the secon							
	Monitoring Java classloader service <specify a="" configurable="" javaclassloader="" service=""></specify>							
16.	Open the RetrieveFromCache java node.							
	The following are the important parts of the java code.							
	This section retrieves the MessageID from the MOMD.							
	String msgId = inAssembly .getMessage() .getRootElement() .getFirstElementByPath("/MQMD/CorrelId") .getValueAsString();							

17. This section uses the MessageID to retrieve the name of the reply queue from the Global Cache. The key value pair retrieved from the map will automatically be deleted 60 seconds after the last access attempt. /* * Now we can restore the original ReplyToQ by looking it up * in the cache. Get data from aliveFor60Seconds Map : */ MbGlobalMapglobalMap=MbGlobalMap.getGlobalMap("aliveFor60Seconds"); String replyToQ = (String)globalMap.get(msgId); 18. This section sets the ReplyQ field in the output message, and resets the value of the MessageID to the original value. // Set the ReplyToQ field outMessage.getRootElement().getFirstElementByPath("/MQMD/ReplyToQ"). setValue(replyToQ); // Set the MsgId back to what it was before outMessage.getRootElement().getFirstElementByPath("/MQMD/MsgId").set Value(getBytes(msgId)); Close the RetrieveFromCache java code.

4. Deploy and test in an Integration Node

This part of the lab will test the caching applications, with all applications deployed to a single Integration Node. To demonstrate the global cache, each of the three applications will be deployed into separate Integration Servers, as follows:

- 1. Default Integration Server WXS_Customer
- 2. WXS_Request_Server WXS_Request
- 3. WXS_Response_Server WSX_Response

1.	First, create two new Integration Servers, WXS_Request_Server and							
	WXS_Response_Server. (Right-click the IB9NODE, and select "New Integration							
	Server".)							
2.	Deploy the applications as shown above. Drag and drop the application into the required							
	Integration Server.							
3.	When all three applications are deployed, the IB9NODE should look something like this:							
	Application Dev 23 Patterns Explor							
	Application Development <u>New</u>							
	E WXS_Customer							
	Elows							
	1 retrieveCustomer.msgflow							
	Er A WXS Request							
	E Bows							
	E References							
	E XXS Assponse							
	Emigration in the second secon							
	E References							
	The Integration Nod 🕴 👘 Data Source Exp							
	⊟ material integration Nodes							
	Process_getCustomer							
	E WXS_Kequert_server							
	ter							
	⊡ ~ 7 WXS_Response_Server							
	□····② WX5_Response							
	tresponde ⊡ — MXSJava_Lib							
	default							
	have a second and the second s							

 This data contains a CustomerID with a value of 0001. The CustomerID will be used to retrieve customer data from the SUBREG1 database, by the WXS_Customer application. To ensure the request/reply scenario works, you must specify the name of the reply queue, which is the name of the queue where the final output will appear (ie. the Response application will write to this queue). 5. On the MQMD tab, set the "Reply to Queue" to GLOBAL.CACHE.OUT. Set the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write Wew ids MQ Heb We will serve the read write the message to the input queue GLOBAL.CACHE.IN on IB9QMGR 	4.	Open RFHUtil, and open the file named c:\student \ global_cache \ data \ Customer0001.xml.					
5. On the MQMD tab, set the "Reply to Queue" to GLOBAL. CACHE. OUT. 5. On the MQMD tab, set the "Reply to Queue" to GLOBAL. CACHE. OUT. 7. On the MQMD pab, set the "Reply to Queue" to GLOBAL. CACHE. OUT. 8. On the MQMD pab, set the "Reply to Queue" to GLOBAL. CACHE. OUT. 9. On the MQMD pab, set the "Reply to Queue" to GLOBAL. CACHE. OUT. 9. On the MQMD pab, set the "Reply to Queue" to GLOBAL. CACHE. OUT. 9. On the MQMD pab, set the "Reply to Queue" to GLOBAL. CACHE. OUT. 9. On the MQMD pab, set the "Reply to Queue" to GLOBAL. CACHE. OUT. 9. On the Main tab, write the message to the input queue GLOBAL. CACHE. IN on IB9QMGR		This data contains a CustomerID with a value of 0001. The CustomerID will be used to retrieve customer data from the SUBREG1 database, by the WXS_Customer application. To ensure the request/reply scenario works, you must specify the name of the reply queue, which is the name of the gueue where the final autout will appear (is the Despace).					
5. On the MQMD tab, set the "Reply to Queue" to GLOBAL.CACHE.OUT. File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help File Edit Search Read Write The Work Ids MQ Help File Edit Search Read Write The Work Ids MQ Help File Edit Search Read Write The Work Ids MQ Help File Edit Search Read Write The Manager File Edit Search Read Write The message to the input queue GLOBAL.CACHE.IN on IB9QMGR		application will write to this queue).					
File Edit Search Read Write View Ids MQ Help File Edit Search Read Write View Ids MQ Help Main Data MQMD PS Usr Prop RFH PubSub pscr jms usr other CICS IMS MQ Message Format User Id Code Page Backout Count Priority Orig Len Put Date/Time Expiry MsgType Feedback Int Fint PD Fint Message ID 000000000000000000000000000000000000	5.	On the MQMD tab, set the "Reply to Queue" to GLOBAL.CACHE.OUT.					
File Edit Search Read Write View Lds MQ Help Main Data MOMD PS User Prop RFH PubSub pscr jms usr other CLCS IMS Mdl Message Format User Id Code Page Backout Count Priority Dig Len 1 Put Date/Time Expiry MsgType Feedback Int Fmt PD Fmt PD Fmt 000000000000000000000000000000000000		📾 RfhUtil ¥7.0.2					
Main Data MUMU PS Usr Prop RFH PubSub pscr jms usr other CICS IMS MQ Message Format User Id Code Page Backout Count Priority Dig Len 1 Put Date/Time Expiry MigType Feedback Int Fint PD		File Edit Search Read Write View Ids MQ Help					
MQ Message Format User Id Code Page Backout Count Priority Orig Len Put Date/Time Expiry MsgType Feedback Int Fmt PD Fmt Put Date/Time Expiry MsgType Feedback Int Fmt PD Fmt Image: Correl ID Image: Correl ID		Main Data MQMD PS Usr Prop RFH PubSub pscr jms usr other CICS IMS I					
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Group Id Group		Message ID 000000000000000000000000000000000000					
Image: Control of the message to the input queue GLOBAL.CACHE.IN on IB9QMGR		Image: Control of Control o					
Application Identity Id Display Report Options Appl Origin Appl Type Ascii Put Application Name Ascii Ebcodic Put Application Name Hex No< Yes Data Full Reply To Queue Manager Obscard/Expire Discard Discard/Expire Reply To Queue Manager Discard Discard/Expire GLOBAL_CACHE.OUT Accounting Token Persistent Msg Reset Ids Accounting Token Copy Msg Id to Correl Id On the Main tab, write the message to the input queue GLOBAL.CACHE.IN on IB9QMGR		Group Id Group Id Last Last 000000000000000000000000000000000000					
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Put Application Name Put Application Name Put Application Name Pass Ores Reply To Queue Manager PAN Reply To Queue Discard Discard/Expiry Reply To Queue Persistent Msg GLOBAL.CACHE.OUT No Accounting Token Persistent Msg Copy Msg Id to Correl Id On the Main tab, write the message to the input queue GLOBAL.CACHE.IN on IB9QMGR		Id Display Except O No O Yes O Data O Full Appl Origin Appl Type O Ascii Expire O No O Yes O Data O Full					
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Reply To Queue Manager Discard Discard/Expiry Reply To Queue Persistent Msg GLOBAL CACHE.OUT Reset Ids Accounting Token Yes Copy Msg Id to Correl Id On the Main tab, write the message to the input queue GLOBAL.CACHE.IN on IB9QMGR		PAN DAN					
Reply To Queue GLOBAL.CACHE.DUT Accounting Token On the Main tab, write the message to the input queue GLOBAL.CACHE.IN on IB9QMGR		Reply To Queue Manager Discard Discard/Expiry					
Accounting Token		Reply To Queue					
On the Main tab, write the message to the input queue GLOBAL.CACHE.IN on IB9QMGR		Accounting Token O Yes					
On the Main tab, write the message to the input queue GLOBAL.CACHE.IN on IB9QMGR		Copy Msg Id to Correl Id					
On the Main tab, write the message to the input queue GLOBAL.CACHE.IN on IB9QMGR							
		On the Main tab, write the message to the input queue GLOBAL.CACHE.IN on IB9QMGR					

6	a In Integration Explorer you should see that the message count for CLORAL CACHE OUT has								
0.	In megration Explorer, you should see that the message count for GLOBAL.CACHE.OUT has								
	been incremented by 1.								
	This demonstrates that the Request and Response applications both have access to the								
same shared data (the name of the reply queue), even though they are running in ser									arate
Integration Servers. This is provided by the embedded global cache									
		xpiorer - Co		Gradion Log					
	puer	Queues							
	Filter:	Standard f	or Queues						
		Queue nam	e	Queue type	Open input count	Open output count	Current queue depth	Put messages	Get messa
	🖸 Di	EST.FAILURE	E	Local	0	0	0	Allowed	Allowed
	🖸 Di	EST.IN		Local	0	0	0	Allowed	Allowed
	🖸 D	ESTLIST.FAI	LURE	Local	0	0	0	Allowed	Allowed
		ESTLIST.IN		Local	0	0	0	Allowed	Allowed
	D Fi	AILURE		Local	0	0	0	Allowed	Allowed
	🖸 G	LOBAL.CACH	E.CUSTOMER.IN	Local	1	1	0	Allowed	Allowed
				Local	1	1	1	Allowed	Allowed
		LODAL.CACF		LUCAI		1	1	Allowed	Allowed
				Remote	1	1	0	Allowed	HIOWCO
								Timorroa	
7.	In a se	econd F	RFHUtil instance	e, read the	e queue GLC	BAL.CACHE	.OUT.		
	This s	hould s	how a record fro	om the Cl	USTOMER 1	able.			
	SE GLO	BAL.CACHE	.OUT						
	File Ec	lit Search	Read Write View I	ds MQ Help					
	Main	Data	MQMD PS	Usr Prop	RFH PubS	ub pscr jms	s usr oth	er CICS	IMS
Message Data (86) from GLOBAL.CACHE.OUT <customer> <firstname>Paul</firstname> <testname>Tergeist (Regular) </testname></customer>									
								Data F	ormat
								aracter	
								ς μ	
		CUSTOM	ER>	arar, 0, 10	Donanco				
								O PAR	SSED
									BOL
	C JSON								
	O EX								
									-

4.1 Show the embedded Cache Resource Statistics in Integration Explorer



3. Both the graphical and tabular views will open. On the tabular view, click the GlobalCache tab. You will see that the MapWrites count will be incremented by 3 since the WXS_Request application has written to 3 maps: "aliveFor60Seconds"; "alivefor120Seconds"; "aliveIUntilRestart". 🕘 MQ Explorer - Content (🏱 IB9NODE Administration Log 🔠 Resource Statistics Graph 🗐 WXS_RequestIS Resources Statistics (Snapshot time 1 🛛 🔀 DotNet App Domains 🛛 CICS 🗍 DotNet GC 🗍 CORBA 🗍 ConnectDirect 🗍 DecisionServices 🗍 FTEAgent 🗍 FTP 🦷 File 🔤 GlobalCache 🗍 JDBCConnectionPools 🗍 JMS 🛃 TotalMapActions MapReads MapWrites MapRemoves FailedActions MapsUsed ConnectionFailures name summary 0 0 0 3 WMB 3 0 3 0 0 3 0 Performing the same tasks on the WXS_Response_Server will show the GlobalCache 4. "MapReads" count being incremented by one. The WXS Response application reads from

the map "aliveFor60Seconds". Leaving the data in the other two maps untouched.

4.2 Show the Global Cache statistics for the Integration Node

In addition to the statistics provided by the Integration Node for each Integration server, the Integration node also provides statistics about the overall performance of the Extreme Scale cache at the Integration Node level.

This is provided with the masicacheadmin command, which has several parameters.

1.	If more than 120 se using RFHUTIL writ "GLOBAL.CACHE.O	conds has e another r ut" is upo	past since yo message and dated by (indi	u wrote a m make sure cating the ca	nessage to " the queue de ache has bee	GLOBAL epth for en used)	.CACHE.IN"
2.	To display the map	entries in th	ne Integration	Node, oper	n an Integrat	ion Cons	sole.
	Issue the command						
	mq	sicachea	dmin IB9NC	DE -c sho	owMapSizes	5	
	From the listing of the aliveFor120second you have written additional second se	ne MapsSiz onds, ali ditional me	zes you will so lveUntilRe ssages to "G	ee that the the the the the the start all c	hree maps ontain (at lea CHE.IN"	aliveFc ast) one	or60Seconds, entry (more if
	C:\IBM\MQSI\9.0.0. BIP7187I: Output f: eXtreme Scale xscm Starting at: 2013-	0>mqsicach rom the mq d utility 04-25 15:2	eadmin IB9NO sicacheadmin is ' 0:08.088	DE -c showMa command. Th	apSizes he output fi	com the W	WebSphere
	CWXSI0068I: Execut	ing comman	d: showMapSi	zes			
	*** Displaying res	ults for WI	MB data grid	and mapSet	map set.		
	*** Listing maps for Map Name	or IB9NODE Partition	_BETAWORKS-E Map Entries	SB01_3840 * Used Bytes	** Shard Type	Containe	er
	aliveFor120Seconds	8	1	488 B	Primary	IB9NODE_	_BETAWORKS-
	aliveFor60Seconds	8	1	488 B	Primary	IB9NODE	_BETAWORKS-
	aliveUntilRestart ESB01_3840_C-0 Server total: 3 (1	8 KB)	1	488 B	Primary	IB9NODE_	_BETAWORKS-
	*** Listing maps fo Map Name	or IB9NODE <u></u> Partition	_BETAWORKS-E Map Entries	SB01_3847 * Used Bytes	** Shard Type		Container
	aliveFor120Seconds ETAWORKS-ESB01_384	8 7_C-1	1	488 B	Synchronou	sReplica	IB9NODE_B
	aliveFor60Seconds ETAWORKS-ESB01 384	8 7 C-1	1	488 B	Synchronous	sReplica	IB9NODE_B
	aliveUntilRestart ETAWORKS-ESB01_384 Server total: 3 (1	8 7_C-1 KB)	1	488 B	Synchronous	sReplica	IB9NODE_B
	Total catalog serv. (The used bytes start r the COPY_TO_BYTE	ice domain atistics a S copy mode	count: 6 (2 re accurate e.)	KB) only when ye	ou are using	g simple	objects o
	CWXSI0040I: The sh	owMapSizes	command com	pleted succ	essfully.		
	Ending at: 2013-04	-25 15:20:	10.322				
	BIP8071I: Successf	ul command	completion.				

3. Wait 60 seconds and repeat the command again. This time you will see that data in aliveFor60Seconds has been automatically deleted from the map (the data eviction policy on

the map was specified to delete data after 60 seconds from the last update): C:\IBM\MQSI\9.0.0.0>mqsicacheadmin IB9NODE -c showMapSizes BIP7187I: Output from the mqsicacheadmin command. The output from the WebSphere eXtreme Scale xscmd utility is Starting at: 2013-04-25 15:21:21.650 CWXSI0068I: Executing command: showMapSizes *** Displaying results for WMB data grid and mapSet map set. Listing maps for IB9NODE BETAWORKS-ESB01 3840 *** Map Name Partition Map Entries Used Bytes Shard Type Container ----- ---- ---aliveFor120Seconds 8 1 488 B Primary IB9NODE_BETAWORKS-ESB01_3840_C-0 aliveFor60Seconds 8 0 0 Primary IB9NODE BETAWORKS-ESB01 3840 C-0 aliveUntilRestart 8 1 488 B Primary IB9NODE_BETAWORKS-ESB01_3840_C-0 Server total: 2 (976 B) *** Listing maps for IB9NODE_BETAWORKS-ESB01_3847 *** Map Name Partition Map Entries Used Bytes Shard Type Container ----- ------ ------1 aliveFor120Seconds 8 488 B SynchronousReplica IB9NODE_ BETAWORKS-ESB01_3847_C-1 aliveFor60Seconds 8 0 0 SynchronousReplica IB9NODE BETAWORKS-ESB01_3847_C-1 488 B aliveUntilRestart 8 1 SynchronousReplica IB9NODE_ BETAWORKS-ESB01_3847_C-1 Server total: 2 (976 B) Results were not returned for map name (not provided) and partition (not provide d). Verify that the provided map name and partition are correct or try the comma nd again with fewer filters. Total catalog service domain count: 4 (1 KB) (The used bytes statistics are accurate only when you are using simple objects o r the COPY_TO_BYTES copy mode.) CWXSI0040I: The showMapSizes command completed successfully. Ending at: 2013-04-25 15:21:23.572 BIP8071I: Successful command completion. 4 Wait a further 60 seconds so that the data in the aliveFor120Seconds map also expires. Repeat the mgsicacheadmin command again to see that the map "aliveUntilRestart" is the only map left which contains map entries. Data in this map will not be automatically deleted whilst the IB9NODE cache catalog servers are running. When we wrote data to this map we did not specify MbMapSessionPolicy Data in a map with no data eviction policy can be cleared from the cache: when the IB9NODE is stopped or restarted using "mqsicacheadmin <IBNODE> -c clearGrid -m <MAPNAME>"

5. Deploy and test in different Integration Nodes

This section will deploy the same applications, but this time into separate Integration Nodes. The WXS_Response application will be deployed into IB9NODE2.

There are three primary tasks to configure the global cache for inter-Integration Node use:

- Create and edit a global cache configuration file
- Configure the Integration Node IB9NODE to use the cache configuration file
- Configure the second Integration Node, IB9NODE2, to use the cache configuration file

5.1 Configure two Integration Nodes for "shared" global cache

```
1.
    A sample version of the cache configuration file is provided in the IBM Integration Bus
    installation directory, under \MQSI\9.0.0.0\sample\globalcache. Several samples are
    provided. This scenario is based on the "two Integration Node" sample.
    The cache configuration file has been provided for you. Open the file
    c:\student\global_cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml.
    Note the follow key lines. The listenerHost and port ranges much match the values specified
    for the Global Cache config using the Integration Explorer.
    <?xml version="1.0" encoding="UTF-8"?>
    <cachePolicy
    xmlns="http://www.ibm.com/xmlns/prod/websphere/messagebroker/globalcache/policy-1.0">
            <!--The Integration node "IB9NODE" runs on "BETAWORKS-ESB01".-->
            <broker name="IB9NODE" listenerHost="BETAWORKS-ESB01">
                    <!-- This broker hosts one catalog server. -->
                          oges1/cataloge
                    <!-- This broker uses ports between 3840-3859.-->
                    <portRange>
                           <startPort>3840</startPort>
                           <endPort>3859</endPort>
                    </portRange>
            </broker>
            <!-- The Integration node "IB9NODE2" runs on "BETAWORKS-ESB01". -->
            <broker name="IB9NODE2" listenerHost="BETAWORKS-ESB01">
                    <!-- This broker hosts no catalog servers. -->
                    <catalogs>0</catalogs>
                    <!-- This broker uses ports between 4820-4839 -->
                    <portRange>
                           <startPort>4820</startPort>
                           <endPort>4839</endPort>
                    </portRange>
            </broker>
    </cachePolicy>
```

	Properties, Global Cache	3.
	Overtype the value in ca configuration file name: C:\student\Global_	che Policy with the fully qualified name of the global cache
	Leave the port range und	changed (the config file will override this value).
	Leave the Listener host	name as "BETAWORKS-ESB01".
	Click Apply , then OK.	
	IB9NODE - Properties	×
	General Extended	Global Cache
	Statistics Security and Policy	Cache policy: C:\student\Global_cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml
	Global Cache	Port range: 3840-3859
		Listener host name: BETAWORKS-ESB01
		Apply
	?	OK Cancel
3.	In the Integration Explore	er, right-click IB9NODE2, and select Properties, Global Cache.
	Overtype the value in ca c:\student\Global_	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml
	Overtype the value in ca c:\student\Global_ Leave the port range und	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value).
	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value).
	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the Click Apply, then OK.	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value).
	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the Click Apply, then OK.	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value). • Listener host name to "BETAWORKS-ESB01".
	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the Click Apply, then OK.	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value). • Listener host name to "BETAWORKS-ESB01".
	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the Click Apply, then OK.	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value). e Listener host name to "BETAWORKS-ESB01". Global Cache Cache policy: c:\student\Global_cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml v
	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the Click Apply, then OK. IB9NODE2 - Properties General Extended Statistics Security and Policy WebAdmin Global Cache	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value). e Listener host name to "BETAWORKS-ESB01". Cache policy: c:\student\Global_cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml Port range: 2800-2819
	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the Click Apply, then OK.	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value). e Listener host name to "BETAWORKS-ESB01".
	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the Click Apply, then OK.	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value). e Listener host name to "BETAWORKS-ESB01".
	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the Click Apply, then OK.	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value). e Listener host name to "BETAWORKS-ESB01".
	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the Click Apply, then OK. IB9NODE2 - Properties General Extended Statistics Security and Policy WebAdmin Global Cache	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value). e Listener host name to "BETAWORKS-ESB01".
4.	Overtype the value in ca c:\student\Global_ Leave the port range und If not already set, set the Click Apply, then OK.	che Policy with the global cache configuration file name, cache\resources\IB9NODE_IB9NODE2_CacheConfig.xml changed (the config file will override this value). Listener host name to "BETAWORKS-ESB01".

5.2 Deploy the WXS_Response application in IB9NODE2

Б	To oncure that the application d	laga not have dupling	to conico, in Integration Taalkit dalata
э.	the WXS Despense explication of		te copies, in integration rookit delete
	the WAS_Response application	I IIOIII IB9NODE.	
	Bight-click WXS Besponse Se	arver and select Delet	e All Flows And Besources:
		and select Delet	e, All Flows And Resources.
	Manufacture and the second sec		
	Contegration Nod 23	Exp L	A Library is a logical 🕏
			Start from WSDL and
	🖃 📲 Integration Nodes		Use this task to create
			which includes your Wit
			Start by discovering
	E 2 WXS Response Server		A Service allows you
	IB9NODE2	eploy	resources.
	📈 🖧 default 🔗 St	top	Start from patterns >
	Se Re	efresh	A Pattern is a reusabl
		alata	All Flows And Resources
			Air Hows And Resources
	· · · · · · · · · · · · · · · · · · ·	aunch Debugger (Port is 0)	More Street Contraction
			······
6.	In Integration Toolkit, delete the	WXS_Request appl	ication from WXS_Request_Server (right
	click on WXS_Request_Server	and select "delete", "	All flows and resources":
	(
	诺 Integration Nod 🛛 🚺 Data S	ource Exp	Properties 🛛 🔡 Problems 🚟 Outline
		Pro Pro	perty
		Deploy	
	WYS Decoopse Se	0 1	
		Stop	
	1 105/10022 V	'Refresh	
		Delete	All Flows And Resources
			🗙 Integration Server
	30	Launch Debugger (Port is 0	<u> </u>
	1		
	(Select OK when asked are you	Leuro?)	
	Coloci on when asked are you		

Create a new Integration Server called WXS_Response_Server in IB9NODE2. 7. Deploy the WXS_Response application to this Integration Server. - 8 🕞 Application Dev 🛛 🖧 Patterns Explor b 雪 Application Development New.. . WXS_Customer ٠ 🗄 🖳 📴 Flows retrieveCustomer.msgflow ESQLs 🗄 🖂 WXS_Request 🗄 🕮 Flows Request.msgflow E References WXS_Response 🗄 🖷 💾 Flows Response.msgflow E. References 🗄 🛋 WXSJava_Lib E Independent Resources - 8 Hantegration Nod 🛛 🛍 Data Source Exp = ₽\$ 🖃 📲 Integration Nodes B9NODE 🔁 WXS_Response_Server Ė…∱ IB9NODE2

5.3 Modify the UDP Value in WXS_Request

We want to make sure that the WXS_Customer application sends its customer data back to the second integration node IB9NODE2.

We will do this by changing the WXS_Customer application to send its output to a remote MQ queue definition on IB9QMGR (GLOBAL.CACHE.RESPONSE.REMOTE) which points to a local queue (GLOBAL.CACHE.RESPONSE.IN) defined on IB9QMGR2. The WXS_Customer application gets this information from a user-defined property "ResponseQueue" which is set in the WXS_Request application.

We will now change this value by editing the property in the bar file.



🜔 New BA	R file			×
Create a	a new BAR file		_	
Create a n	new BAR file resource			
Container:	BARfiles		▼ New	
Folder:	<default></default>		Browse]
Name:	WXS_Request_MultiNodes			
0			_	1
(Click Fir	nish to create the bar file).	Finish	Cancel]
(Click Fir When the button (cl	nish to create the bar file). e "Prepare" tab appears, s lick OK when the bar file	Finish select the tick box has been successf	WXS_Reques ully created):	t, Click Build and Save
(Click Fir When the button (cl	hish to create the bar file). e "Prepare" tab appears, s lick OK when the bar file	Finish select the tick box has been success	WXS_Reques ully created):	t, Click Build and Save
(Click Fin When the button (cl	hish to create the bar file). e "Prepare" tab appears, s lick OK when the bar file w (WXS_Requestproject.generated.bar ()	Finish select the tick box has been success	WXS_Reques ully created):	t, Click Build and Save
(Click Fin When the button (cl Prepare Select deple Deployable Re	hish to create the bar file). e "Prepare" tab appears, s lick OK when the bar file w (WXS_Requestproject.generated.bar ()	Finish Select the tick box has been successf "WXS_Request_MultiNodes.bar 23 archive	WXS_Reques ully created):	t, Click Build and Save
(Click Fin When the button (cl Prepare Select deple Deployable Re Select an appli applications.	hish to create the bar file). e "Prepare" tab appears, s lick OK when the bar file w (WS_Requestproject.generated.bar () cyable resources to include in the broker sources lication to package all its contained resources. Resources to	Finish Select the tick box has been successi "WXS_Request_MultiNodes.bar 23 archive	Cancel WXS_Reques ully created):	t, Click Build and Save
(Click Fin When the button (cl Prepare Select deple Select an appl applications. © Application Text filter:	hish to create the bar file). e "Prepare" tab appears, s lick OK when the bar file w I WXS_Requestproject.generated.bar oyable resources to include in the broken issources lication to package all its contained resources and s and Services O Message flows, libraries and other me type filter text	Finish Select the tick box has been success WXS_Request_MultiNodes.ber 2 archive within an application are isolated from othe ssage flow dependencies	Cancel	t, Click Build and Save

WXS_Request_MultiNodes.bar 🕺				
Manage				
Rebuild, remove, edit, add resources	to broker archive and	configure their properties		
🔡 🔊 🖗 Filter by: <a>Type filter text>		•		
Name	Туре	Modified	Size Path	Version Com
Karal Request Big Request.msgflow	Application Message flow	29-Apr-2013 16:05:32 29-Apr-2013 16:05:32	2749	
GLOBAL.CACHE.IN				
Save to Cache	Library	29-Apr-2013 16:05:32	14072	
_				
Command for packaging the BAP contents				
Promise Manage Heat Lee Service Lee				
	rata) 📼 Parta matta a			
	ies of selected built resource			
Configure	es of selected bailt resource.			
Change the value for Re *wxs_Request_MultiNodes.bar Manage	sponseQueue	to "GLOBAL.CACHE.	RESPONSE.REM	10TE"
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac	sponseQueue	to "GLOBAL . CACHE . broker archive and con	RESPONSE . REM figure their prope	IOTE"
Change the value for Re "*WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac El 🔊 🖗 🖗 Filter by: <	sponseQueue	to "GLOBAL . CACHE . broker archive and con	RESPONSE . REM	IOTE"
Change the value for Re "*WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac El a s filter by: Name	sponseQueue	to "GLOBAL.CACHE.	RESPONSE . REM	10TE" rties
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac Hanage Rebuild, remove, edit, ac Manage Rebuild, remove, edit, ac	sponseQueue	to "GLOBAL.CACHE. broker archive and con	RESPONSE . REM	10TE" rties 6:05:32
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Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac Rebuild, remove, edit, ac Name Kame Kame Request Kame Reques	sponseQueue	to "GLOBAL.CACHE. broker archive and con Type Application Message flow	RESPONSE . REM	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac Name Name Request Request Request Request	sponseQueue	to "GLOBAL.CACHE. broker archive and con Type Application Message flow	response.rem	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac Name Name Request Request Request GloBAL.CACH Code	sponseQueue	to "GLOBAL.CACHE. broker archive and con Type Application Message flow	response.rem	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac Name Name Request Request Request GloBAL.CACH Save to Cache Manage Manage	sponseQueue	to "GLOBAL.CACHE. broker archive and con Type Application Message flow	RESPONSE . REM	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac Rebuild, remov	sponseQueue	to "GLOBAL.CACHE. broker archive and con Type Application Message flow Library	RESPONSE . REM	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ad Rebuild, remov	sponseQueue	to "GLOBAL.CACHE. broker archive and con Type Application Message flow Library	RESPONSE . REM	10TE" rties 6:05:32 6:05:32
Command for packaging the solution of the solu	sponseQueue	to "GLOBAL.CACHE.	RESPONSE . REM	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ad Name Name Name Request Request Request Save to Cache MXS_lava_Lib Command for packaging the	sponseQueue	to "GLOBAL.CACHE.	RESPONSE.REM	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac Name Name Name Request Request Request Substrate MXS_Request Command for packaging th Prepare Manage User Log Service	sponseQueue	to "GLOBAL.CACHE.	RESPONSE.REM	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ad Rebuild, remov	sponseQueue	to "GLOBAL.CACHE.	RESPONSE.REM	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac Rebuild, remove, edit, ac Rebuild, remove, edit, ac Rebuild, remove, edit, ac Repuest Request	sponseQueue	to "GLOBAL.CACHE.	RESPONSE.REM	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ac Repuest Command for packaging th Prepare Manage User Log Service Request Configure	sponseQueue	to "GLOBAL.CACHE.	RESPONSE.REM	10TE" rties 6:05:32 6:05:32
Change the value for Re *WXS_Request_MultiNodes.bar Manage Rebuild, remove, edit, ad Repuest Configure	sponseQueue	to "GLOBAL.CACHE.	RESPONSE.REM	10TE" rties 6:05:32 6:05:32
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13. Deploy the saved bar file to the (empty) WXS_Request_Server in IB9NODE (ie. the same place as before, although this time you are deploying the updated barfile, rather than the application):



5.4 Test and Review the Global Cache Statistics

14. The two queue managers, IB9QMGR and IB9QMGR2 have already been defined with the necessary MQ channels and transmission queues. The channels are set to automatically start when a message appears on the transmission queue. Now retest the applications with RFHUtil. 15. Using the same input data, and the same input queue, write the message to GLOBAL.CACHE.IN. (Make sure the MQMD Reply Queue is still set to GLOBAL.CACHE.OUT). 16. In MQ Explorer, again select the queues defined for the IB9QMGR queue manager. Note that the queue depth for the GLOBAL.CACHE.OUT on IB9QMGR has been incremented by 1. 🕾 MQ Explorer - Navigator 🛛 - 8 😑 🔲 🍘 MQ Explorer - Content 🕱 🛛 🎟 Resource Statistics Graph () 🎟 Resource Statistics Table () 🏲 IB9NODE Administration Lo 4월 - 17년 🧇 🖻 IBM WebSphere MQ -Queues - 🗁 Queue Managers E IB9QMGR Filter: Standard for Queues 🗁 Queues > Topics Queue name Queue type | Open input count | Open output count | Current queue depth | Put messag 🔺 Bubscriptions BOOK_ORDER_IN Local 0 0 0 Allowed 🗄 🗁 Channels BOOK_ORDER_OUT Local 0 0 0 Allowed - Contraction Telemetry DOTNET.ALT Local Allowed 🗁 Listeners DOTNET.ESOL.IN Local 0 0 Allowed DOTNET.ESQL.OUT - C Services Local Allowed Process Definitions DOTNET.IN Local 0 0 Allowed IB9NODE DOTNET.IN2 Loca Allowed Namelists Local 0 0 Allowed GLOBAL.CACHE.CUSTOMER.IN Allowed Local Communication Information GLOBAL.CACHE.IN Loca wed Security Policies GLOBAL.CACHE.OUT Allowed Allowed Local E IB90MGR2 GLOBAL.CACHE.RESPONSE.IN Local De Queues GLOBAL.CACHE.RESPONSE.REMOTE Remote 17. Use the second RFHUtil to read the queue GLOBAL.CACHE.OUT. ST GLOBAL.CACHE.OUT File Edit Search Read Write View Ids MQ Help Main Data MQMD PS Usr Prop RFH PubSub pscr jms usr other CICS IMS Message Data (86) from GLOBAL.CACHE.OUT Data Format * <CHSTOMER> C Character ⊖ <u>H</u>ex <FirstName>Paul</FirstName> <LastName>Tergeist(Regular)</LastName> C <u>B</u>oth • XML </CUSTOMER> O PARSED COBOL C O JSON $\bigcirc \underline{F} \boxtimes$ In an Integration Console, run the following command: 18. mqsicacheadmin IB9NODE -c showMapSizes to see the map entries written to the three maps in the WXS Request application:

```
C:\IBM\MQSI\9.0.0.0>mqsicacheadmin IB9NODE -c showMapSizes
19.
    BIP7187I: Output from the mqsicacheadmin command. The output from the WebSphere
    eXtreme Scale xscmd utility is '
    Starting at: 2013-04-30 11:15:02.853
    CWXSI0068I: Executing command: showMapSizes
    *** Displaying results for WMB data grid and mapSet map set.
    *** Listing maps for IB9NODE_BETAWORKS-ESB01_3840 ***
              Partition Map Entries Used Bytes Shard Type Container
    Map Name
                                   ---- -
    aliveFor120Seconds 8 1 488 B Primary IB9NODE_BETAWORKS-
    ESB01 3840 C-0
    aliveFor60Seconds 8
                             1
                                         488 B
                                                   Primary IB9NODE_BETAWORKS-
    ESB01_3840_C-0
                                         488 B
    aliveUntilRestart 8
                              1
                                                   Primary IB9NODE_BETAWORKS-
    ESB01_3840_C-0
    Server total: 3 (1 KB)
    *** Listing maps for IB9NODE_BETAWORKS-ESB01_3844 ***
                    Partition Map Entries Used Bytes Shard Type
   Map Name
                                                                      Container
                       _____ __ ___
    aliveFor120Seconds 8
                              1
                                          488 B
                                                    SynchronousReplica IB9NODE_B
   aliveForl20Seconds c
ETAWORKS-ESB01_3844_C-1
                              1 488 B
    aliveFor60Seconds 8
                                                   SynchronousReplica IB9NODE_B
    ETAWORKS-ESB01_3844_C-1
                              1 488 B SynchronousReplica IB9NODE_B
    aliveUntilRestart 8
    ETAWORKS-ESB01_3844_C-1
    Server total: 3 (1 KB)
    Results were not returned for map name (not provided) and partition (not provide
    d). Verify that the provided map name and partition are correct or try the comma
    nd again with fewer filters.
    Total catalog service domain count: 6 (2 KB)
    (The used bytes statistics are accurate only when you are using simple objects o
    r the COPY_TO_BYTES copy mode.)
    CWXSI0040I: The showMapSizes command completed successfully.
    Ending at: 2013-04-30 11:15:07.744
    BIP80711: Successful command completion.
    C:\IBM\MQSI\9.0.0>
    The above shows the output from the mgsicacheadmin command within 60 seconds of the
    application running as all three maps have map entries.
    If you wait longer to run the command maps "AliveFor60Seconds" and
    "aliveFor120Seconds" will have had their data removed automatically.
```

This concludes the Global Cache with WebSphere eXtreme Scale lab.