Cisco Tidal Enterprise Scheduler 6.2 Performance Tuning Guide

May 20, 2014

Optimizing TES Performance

The purpose of this document is to help you troubleshoot performance issues with Tidal Enterprise Scheduler. Optimization and tuning is an exact science which is why it is critical to be able to recognize which parts of the system are being stressed (monitoring) and then knowing what parameters should be adjusted to reduce that stress (tuning).

TES 6.2 Hardware Requirements

Configuration Definition

	Jobs Definition	**DB Size**
Small Configuration	1 – 3000	< 4 GB
Medium Configuration	3,000 – 20,000	< 16 GB
Large Configuration	20,000 and less than 100 K	> 32GB

Master Configuration

Master Configuration	**Memory**	**CPU Cores**
Small	8GB	4
Medium	16GB	8
Large	24GB	16

Note For each adapter instance use the following guidelines for RAM allocation:
1 GB of extra RAM for Small and Medium configurations
2GB of extra RAM for Large configuration

Client Manager Configuration

Client Manager Configuration	Memory	CPU Cores
Small	12 GB	8
Medium	24 GB	16
Large	32 GB	24

Master and Client Manager DB Configuration

Minimum size required by Master and Client Manager Databases:

- MS SQL Server: 128 MB Data, 32 MB Log
- Oracle: 400 MB Data, 300 MB Index, 200 MB Temp

As the number of jobs or logs increases, DBA should tune the DB accordingly

Java Client Configuration

Java Client	Memory	CPU Cores
Small	4 GB	4
Medium	8 GB	4
Large	12 GB	8

Transporter Configuration

Transporter	Memory	CPU Cores
Small	8GB	4
Medium	12GB	8
Large	16GB	12

Note All Memory, CPU, and Disk requirements are for TES related components only, and does not take into account any additional OS/application requirements.

Performance Matrix

The tables below help you link common catalysts that impact performance with the areas that need to be monitored/tuned to get better performance.

Table 1-1 Client Manager and DSP Performance Matrix

Catalyst	CPU	Memory	JMS	Cache Read	Cache Write	Cache Tuning	Cache Sync
Users	X	X	X	X		X	
Schedule Activity	X	X	X		X		
Schedule Compile	X	X	X		X		
Cache Sync	X	X	X		X		X

For example, in the table above, if you are experiencing performance problems with large schedules, the items you should tune or monitor would be the CPU, the memory, your JMS, and the Cache Write.

Table 1-2 Master Performance Matrix

Catalyst	CPU	Memory	JMS	DB Connections	Message Threads
Client Managers	X	X	X	X	X
Adapter Connections	X	X			X
Agents	X	X			X
Schedule Activity	X	X	X	X	X
Schedule Compile	X	X	X	X	
Definitions		X		X	
Logs and History				X	
Cache Sync	X	X	X	X	X

Monitoring with JConsole

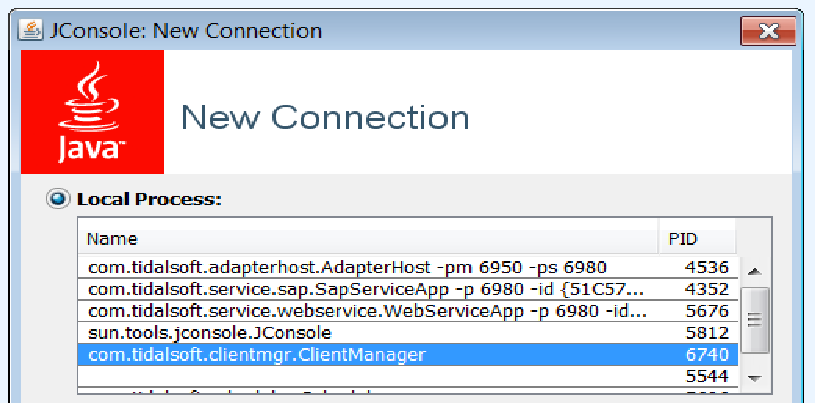
JConsole is a diagnostic tool that comes with the standard JDK. It allows you to connect directly to a running JVM and monitor many performance metrics, including memory/CPU usage. JConsole can also be used to access diagnostic modules exposed by each individual application called MBeans. Both the Master and Client Manager expose MBeans.

Connecting JConsole

Before connecting JConsole to either the Client Manager or Master, make sure the following property is set in clientmgr.props or master.props.

JmxOn=Y

If you are running JConsole on the same machine as the JVM you are connecting to, the JVM will be listed in JConsole.

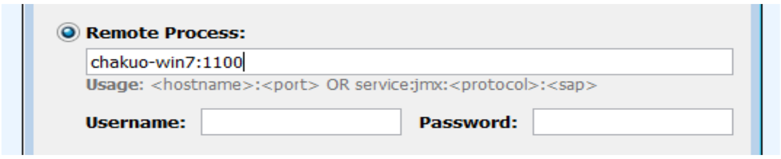

JConsole: New Connection

New Connection

● Local Process:

Name	PID
com.tidalsoft.adapterhost.AdapterHost -pm 6950 -ps 6980	4536
com.tidalsoft.service.sap.SapServiceApp -p 6980 -id {51C57...	4352
com.tidalsoft.service.webservice.WebServiceApp -p 6980 -id...	5676
sun.tools.jconsole.JConsole	5812
com.tidalsoft.clientmgr.ClientManager	6740
	5544

If you are connecting JConsole to a JVM running on a remote machine, type in the remote JVM's machine host name and port (the default CM port is 1100).


● Remote Process:

chakuo-win7:1100

Usage: <hostname>:<port> OR service:jmx:<protocol>:<sap>

Username: Password:

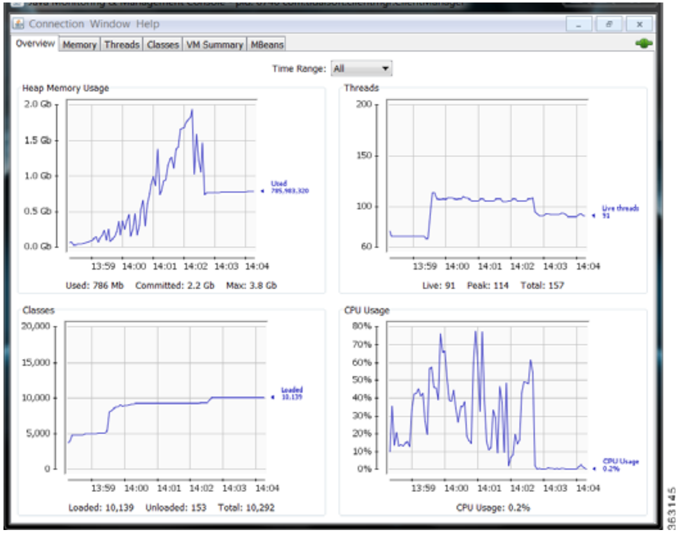
Note You can change the default port for the JVM by setting the following property in clientmgr.props or master.props.
JmxRmiPort=1200

Viewing a System Overview

The Overview tab of JConsole provides an overview of JVM's memory, threads, and CPU usage.

To view a system overview of the vital stats for the JVM, select the **Overview** tab of the console.

Figure 1-1 **Viewing Vital Stats for JVM**



Time Range: All

Used: 786 Mb Committed: 2.2 Gb Max: 3.8 Gb

Live: 91 Peak: 114 Total: 157

Loaded: 10,139 Unloaded: 153 Total: 10,292

CPU Usage: 0.2%

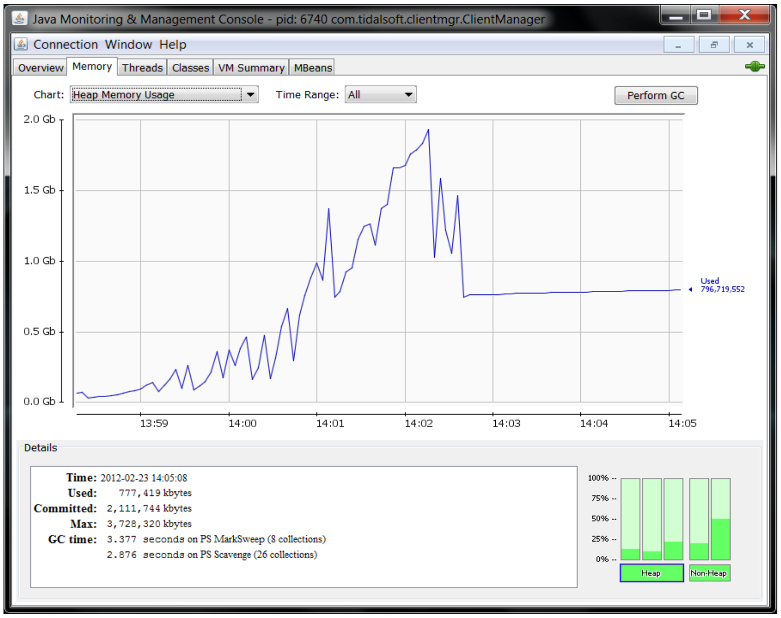
Viewing Memory Usage

To view memory usage, select the **Memory** tab of the console.

The memory tab provides more detailed information about JVM's memory use, allowing you to determine if the JVM has sufficient memory for the application that is running.

Note For a normal running JVM, you should see memory use increase and decrease in the short term. However, if you see that memory use is increasing in the long term, it may indicate a memory that will eventually result in an out-of-memory termination.

Figure 1-2 Viewing Memory Usage



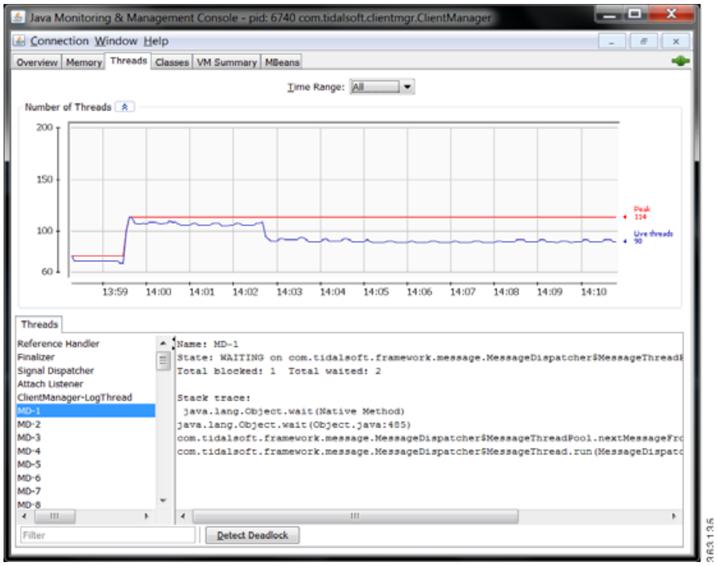
Time: 2012-02-23 14:05:08
Used: 777,419 kbytes
Committed: 2,111,744 kbytes
Max: 3,728,320 kbytes
GC time: 3.377 seconds on PS MarkSweep (8 collections)
2.876 seconds on PS Scavenge (26 collections)

Viewing Active Threads

To view active threads and potential deadlocks, select the **Threads** tab of the console.

This screen provides stack traces for every thread in the JVM. A stack trace shows exactly what a thread is doing at the time of the trace. This screen allows you to automatically detect thread deadlocks.

Figure 1-3 Viewing active threads

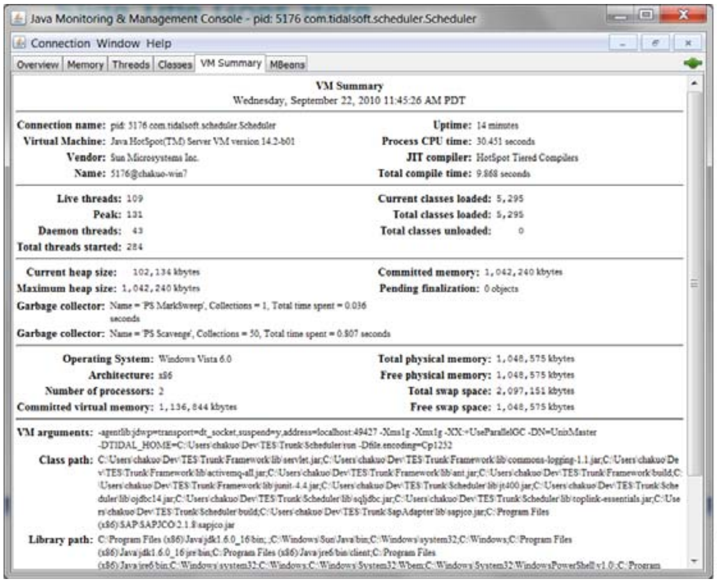


```
Name: MD-1
State: WAITING on com.tidalsoft.framework.message.MessageDispatcher$MessageThreadP
Total blocked: 1  Total waited: 2

Stack trace:
 java.lang.Object.wait(Native Method)
java.lang.Object.wait(Object.java:485)
com.tidalsoft.framework.message.MessageDispatcher$MessageThreadPool.nextMessageFro
com.tidalsoft.framework.message.MessageDispatcher$MessageThread.run(MessageDispatc
```

Viewing a VM Summary

For viewing a virtual machine summary and for basic technical support information, select the VM Summary tab of the console.

Figure 1-4 Viewing a VM summary


Java Monitoring & Management Console - pid: 5176 com.tidalsoft.scheduler.Scheduler
Connection Window Help
Overview
Memory
Threads
Classes
VM Summary
MBeans
363146

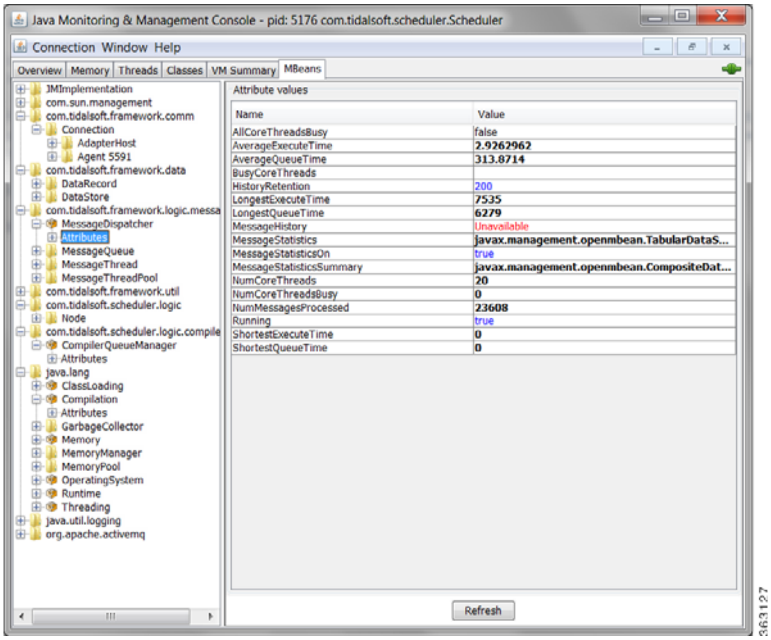
```
                                   VM Summary
                  Wednesday, September 22, 2010 11:45:26 AM PDT

Connection name: pid: 5176 com.tidalsoft.scheduler.Scheduler          Uptime: 14 minutes
Virtual Machine: Java HotSpot(TM) Server VM version 14.2-b01          Process CPU time: 30.451 seconds
         Vendor: Sun Microsystems Inc.                                JIT compiler: HotSpot Tiered Compilers
           Name: 5176@chakuo-win7                                     Total compile time: 9.868 seconds

         Live threads: 109                                            Current classes loaded: 5,295
                 Peak: 131                                            Total classes loaded: 5,295
       Daemon threads: 43                                             Total classes unloaded: 0
Total threads started: 284

  Current heap size:   102,134 kbytes                                 Committed memory: 1,042,240 kbytes
Maximum heap size: 1,042,240 kbytes                                   Pending finalization: 0 objects
Garbage collector: Name = 'PS MarkSweep', Collections = 1, Total time spent = 0.036
                   seconds
Garbage collector: Name = 'PS Scavenge', Collections = 50, Total time spent = 0.807 seconds

          Operating System: Windows Vista 6.0                         Total physical memory: 1,048,575 kbytes
              Architecture: x86                                       Free physical memory: 1,048,575 kbytes
      Number of processors: 2                                         Total swap space: 2,097,151 kbytes
Committed virtual memory: 1,136,844 kbytes                            Free swap space: 1,048,575 kbytes

VM arguments: -agentlib:jdwp=transport=dt_socket,suspend=y,address=localhost:49427 -Xms1g -Xmx1g -XX:+UseParallelGC -DN=UnixMaster
              -DTIDAL_HOME=C:\Users\chakuo\Dev\TES\Trunk\Scheduler\run -Dfile.encoding=Cp1252
  Class path: C:\Users\chakuo\Dev\TES\Trunk\Framework\lib\servlet.jar;C:\Users\chakuo\Dev\TES\Trunk\Framework\lib\commons-logging-1.1.jar;C:\Users\chakuo\De
              v\TES\Trunk\Framework\lib\activemq-all.jar;C:\Users\chakuo\Dev\TES\Trunk\Framework\lib\ant.jar;C:\Users\chakuo\Dev\TES\Trunk\Framework\build;C:
              \Users\chakuo\Dev\TES\Trunk\Framework\lib\junit-4.4.jar;C:\Users\chakuo\Dev\TES\Trunk\Scheduler\lib\jt400.jar;C:\Users\chakuo\Dev\TES\Trunk\Sche
              duler\lib\ojdbc14.jar;C:\Users\chakuo\Dev\TES\Trunk\Scheduler\lib\sqljdbc.jar;C:\Users\chakuo\Dev\TES\Trunk\Scheduler\lib\toplink-essentials.jar;C:\Use
              rs\chakuo\Dev\TES\Trunk\Scheduler\build;C:\Users\chakuo\Dev\TES\Trunk\SapAdapter\lib\sapjco.jar;C:\Program Files
              (x86)\SAP\SAPJCO\2.1.8\sapjco.jar
Library path: C:\Program Files (x86)\Java\jdk1.6.0_16\bin;.;C:\Windows\Sun\Java\bin;C:\Windows\system32;C:\Windows;C:\Program Files
              (x86)\Java\jdk1.6.0_16\jre\bin;C:\Program Files (x86)\Java\jre6\bin\client;C:\Program Files
              (x86)\Java\jre6\bin;C:\Windows\system32;C:\Windows;C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerShell\v1.0\;C:\Program
```

Monitoring Scheduling Activity

Viewing MBeans

For viewing custom monitoring modules (MBeans), select the MBeans tab of the console.

Figure 1-5 Viewing MBeans



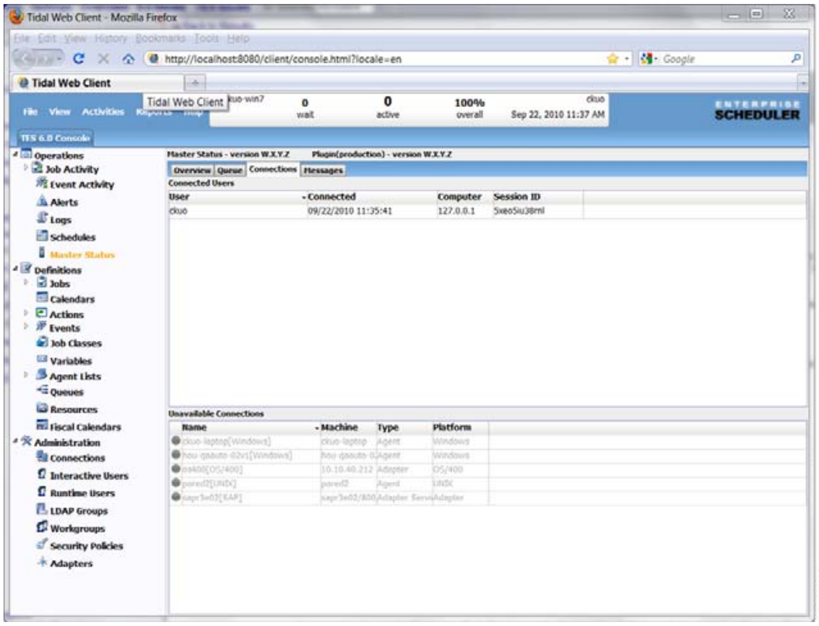
```
JMImplementation
com.sun.management
com.tidalsoft.framework.comm
    Connection
        AdapterHost
        Agent 5591
com.tidalsoft.framework.data
    DataRecord
    DataStore
com.tidalsoft.framework.logic.messa
    MessageDispatcher
        Attributes
    MessageQueue
    MessageThread
    MessageThreadPool
com.tidalsoft.framework.util
com.tidalsoft.scheduler.logic
    Node
com.tidalsoft.scheduler.logic.compile
    CompilerQueueManager
        Attributes
java.lang
    ClassLoading
    Compilation
        Attributes
    GarbageCollector
    Memory
    MemoryManager
    MemoryPool
    OperatingSystem
    Runtime
    Threading
java.util.logging
org.apache.activemq
```

Name	Value
AllCoreThreadsBusy	false
AverageExecuteTime	2.9262962
AverageQueueTime	313.8714
BusyCoreThreads	
HistoryRetention	200
LongestExecuteTime	7535
LongestQueueTime	6279
MessageHistory	Unavailable
MessageStatistics	javax.management.openmbean.TabularDataS...
MessageStatisticsOn	true
MessageStatisticsSummary	javax.management.openmbean.CompositeDat...
NumCoreThreads	20
NumCoreThreadsBusy	0
NumMessagesProcessed	23608
Running	true
ShortestExecuteTime	0
ShortestQueueTime	0

Viewing Connected Users

For viewing connected users, click the **Connections** tab on the Master Status pane.

Figure 1-6 Viewing connected users



Connected Users

User	Connected	Computer	Session ID
ckuo	09/22/2010 11:35:41	127.0.0.1	5xeo5iu38ml

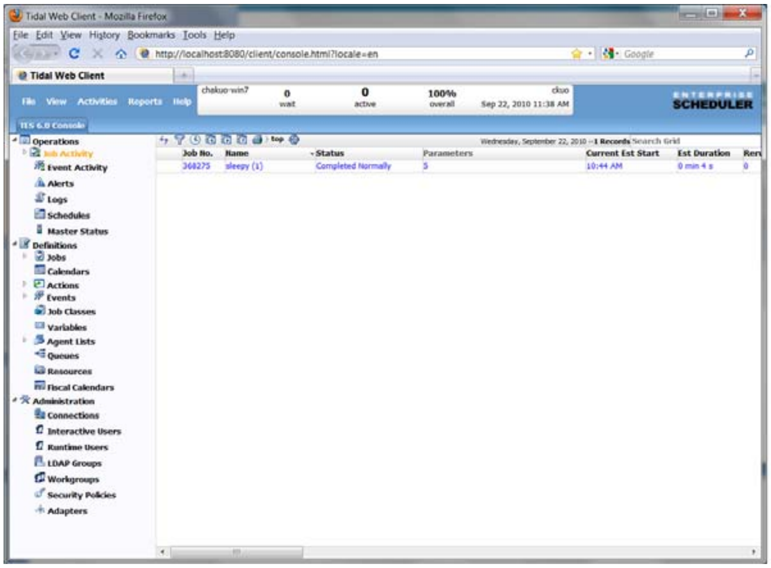
Unavailable Connections

Name	Machine	Type	Platform
ckuo-laptop[Windows]	ckuo-laptop	Agent	Windows
hou-qaauto-02v1[Windows]	hou-qaauto-0	Agent	Windows
os400[OS/400]	10.10.40.212	Adapter	OS/400
pared2[UNIX]	pared2	Agent	UNIX
sapr3e03[SAP]	sapr3e03/800	Adapter Servi	Adapter

Viewing Job Activity

For viewing current job activity, select **Operations > Job Activity** from the Navigation tree to view the Job Activity pane.

Figure 1-7 Viewing Job Activity

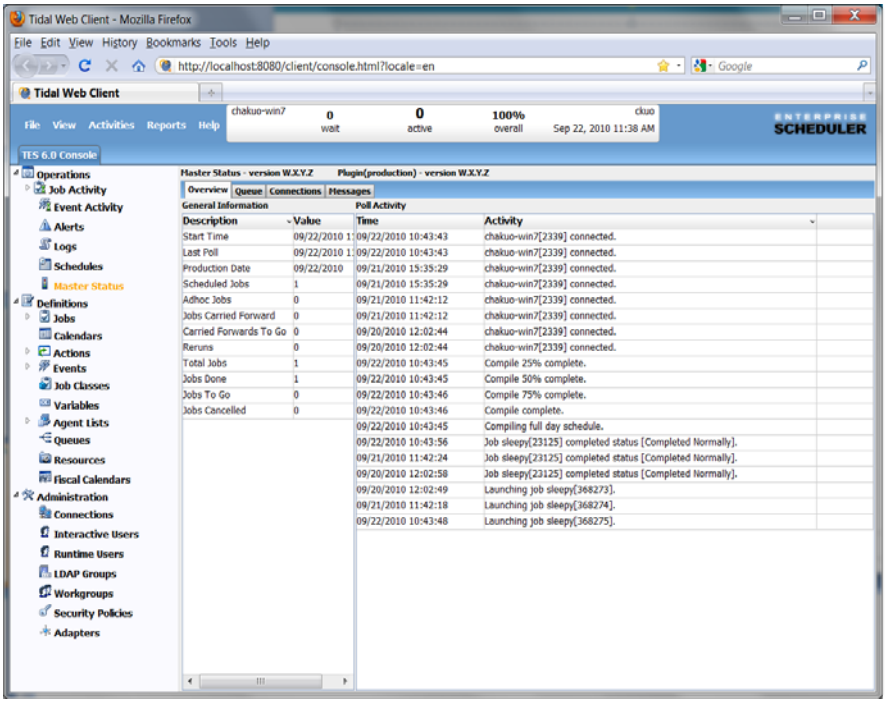


Job No.	Name	Status	Parameters	Current Est Start	Est Duration	Rer
368275	sleepy (1)	Completed Normally	5	10:44 AM	0 min 4 s	0

Viewing Master Status

For viewing an overview of the master status, select **Operations > Master Status** from the Navigation tree to view the Master Status pane, and then click **Overview**.

Figure 1-8 Viewing the Master Status



General Information

Description	Value
Start Time	09/22/2010 1
Last Poll	09/22/2010 1
Production Date	09/22/2010
Scheduled Jobs	1
Adhoc Jobs	0
Jobs Carried Forward	0
Carried Forwards To Go	0
Reruns	0
Total Jobs	1
Jobs Done	1
Jobs To Go	0
Jobs Cancelled	0

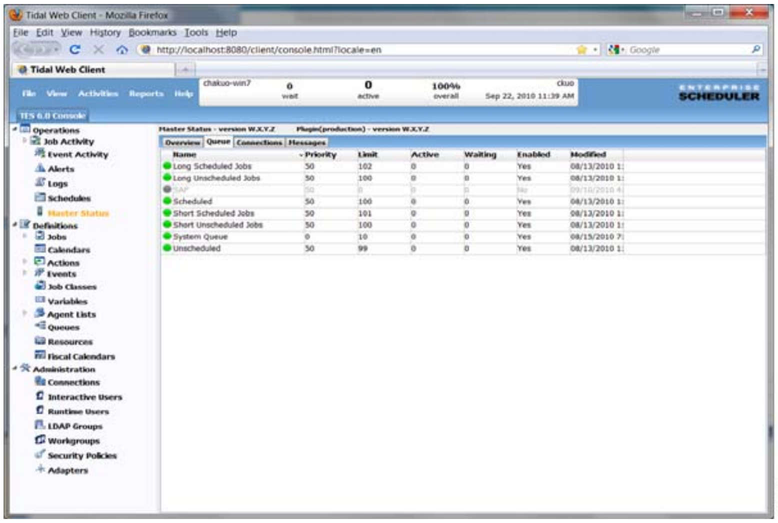
Poll Activity

Time	Activity
09/22/2010 10:43:43	chakuo-win7[2339] connected.
09/22/2010 10:43:43	chakuo-win7[2339] connected.
09/21/2010 15:35:29	chakuo-win7[2339] connected.
09/21/2010 15:35:29	chakuo-win7[2339] connected.
09/21/2010 11:42:12	chakuo-win7[2339] connected.
09/21/2010 11:42:12	chakuo-win7[2339] connected.
09/20/2010 12:02:44	chakuo-win7[2339] connected.
09/20/2010 12:02:44	chakuo-win7[2339] connected.
09/22/2010 10:43:45	Compile 25% complete.
09/22/2010 10:43:45	Compile 50% complete.
09/22/2010 10:43:46	Compile 75% complete.
09/22/2010 10:43:46	Compile complete.
09/22/2010 10:43:45	Compiling full day schedule.
09/22/2010 10:43:56	Job sleepy[23125] completed status [Completed Normally].
09/21/2010 11:42:24	Job sleepy[23125] completed status [Completed Normally].
09/20/2010 12:02:58	Job sleepy[23125] completed status [Completed Normally].
09/20/2010 12:02:49	Launching job sleepy[368273].
09/21/2010 11:42:18	Launching job sleepy[368274].
09/22/2010 10:43:48	Launching job sleepy[368275].

Viewing Queue Activity

For viewing queue activity, choose **Operations > Master Status** from the Navigation tree to view the Master Status pane, and then click **Queue**.

Figure 1-9 Viewing Queue Activity

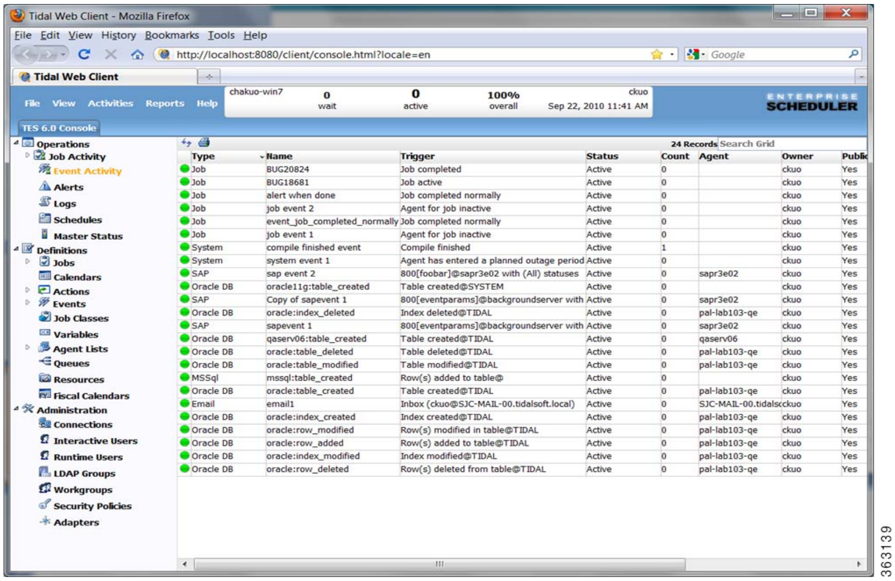


Name	Priority	Limit	Active	Waiting	Enabled	Modified
● Long Scheduled Jobs	50	102	0	0	Yes	08/13/2010 1:
● Long Unscheduled Jobs	50	100	0	0	Yes	08/13/2010 1:
● SAP	50	0	0	0	No	09/10/2010 4:
● Scheduled	50	100	0	0	Yes	08/13/2010 1:
● Short Scheduled Jobs	50	101	0	0	Yes	08/13/2010 1:
● Short Unscheduled Jobs	50	100	0	0	Yes	08/13/2010 1:
● System Queue	0	10	0	0	Yes	08/15/2010 7:
● Unscheduled	50	99	0	0	Yes	08/13/2010 1:

Viewing Event Activity

To view event activity, choose **Operations > Event Activity** from the Navigation tree to view the Event Activity pane.

Figure 1-10 Viewing Event Activity

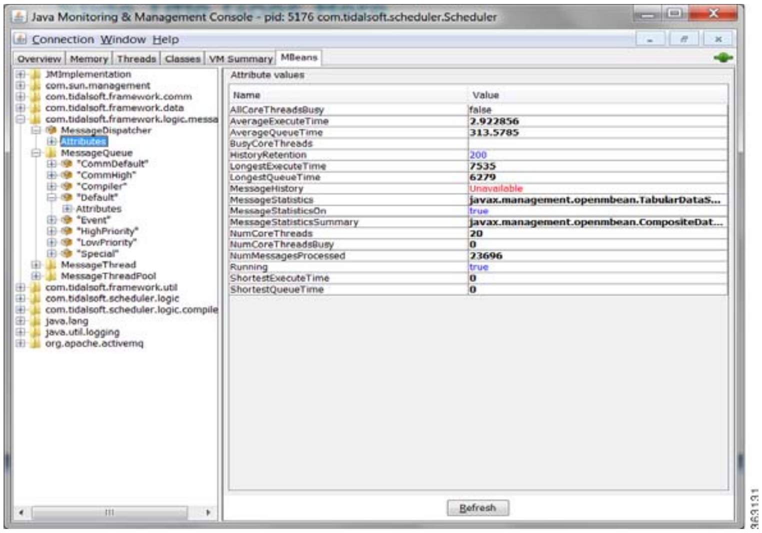


Type	Name	Trigger	Status	Count	Agent	Owner	Public
Job	BUG20824	Job completed	Active	0		ckuo	Yes
Job	BUG18681	Job active	Active	0		ckuo	Yes
Job	alert when done	Job completed normally	Active	0		ckuo	Yes
Job	job event 2	Agent for job inactive	Active	0		ckuo	Yes
Job	event_job_completed_normally	Job completed normally	Active	0		ckuo	Yes
Job	job event 1	Agent for job inactive	Active	0		ckuo	Yes
System	compile finished event	Compile finished	Active	1		ckuo	Yes
System	system event 1	Agent has entered a planned outage period	Active	0		ckuo	Yes
SAP	sap event 2	800[foobar]@sapr3e02 with (All) statuses	Active	0	sapr3e02	ckuo	Yes
Oracle DB	oracle11g:table_created	Table created@SYSTEM	Active	0		ckuo	Yes
SAP	Copy of sapevent 1	800[eventparams]@backgroundserver with	Active	0	sapr3e02	ckuo	Yes
Oracle DB	oracle:index_deleted	Index deleted@TIDAL	Active	0	pal-lab103-qe	ckuo	Yes
SAP	sapevent 1	800[eventparams]@backgroundserver with	Active	0	sapr3e02	ckuo	Yes
Oracle DB	qaserv06:table_created	Table created@TIDAL	Active	0	qaserv06	ckuo	Yes
Oracle DB	oracle:table_deleted	Table deleted@TIDAL	Active	0	pal-lab103-qe	ckuo	Yes
Oracle DB	oracle:table_modified	Table modified@TIDAL	Active	0	pal-lab103-qe	ckuo	Yes
MSSql	mssql:table_created	Row(s) added to table@	Active	0		ckuo	Yes
Oracle DB	oracle:table_created	Table created@TIDAL	Active	0	pal-lab103-qe	ckuo	Yes
Email	email1	Inbox (ckuo@SJC-MAIL-00.tidalsoft.local)	Active	0	SJC-MAIL-00.tidals	ckuo	Yes
Oracle DB	oracle:index_created	Index created@TIDAL	Active	0	pal-lab103-qe	ckuo	Yes
Oracle DB	oracle:row_modified	Row(s) modified in table@TIDAL	Active	0	pal-lab103-qe	ckuo	Yes
Oracle DB	oracle:row_added	Row(s) added to table@TIDAL	Active	0	pal-lab103-qe	ckuo	Yes
Oracle DB	oracle:index_modified	Index modified@TIDAL	Active	0	pal-lab103-qe	ckuo	Yes
Oracle DB	oracle:row_deleted	Row(s) deleted from table@TIDAL	Active	0	pal-lab103-qe	ckuo	Yes

Monitoring the Overall Message System

For monitoring the overall message system, click the MBeans tab on the Java console, and then select Attributes from the tree to view the attribute values.

Figure 1-11 Monitoring the overall message system



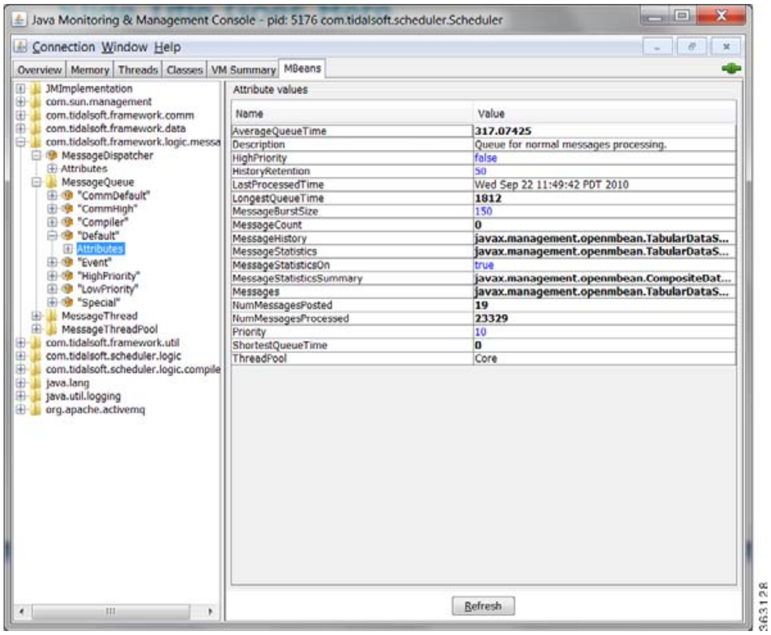
Attribute values

Name	Value
AllCoreThreadsBusy	false
AverageExecuteTime	2.922856
AverageQueueTime	313.5785
BusyCoreThreads	
HistoryRetention	200
LongestExecuteTime	7535
LongestQueueTime	6279
MessageHistory	Unavailable
MessageStatistics	javax.management.openmbean.TabularDataS...
MessageStatisticsOn	true
MessageStatisticsSummary	javax.management.openmbean.CompositeDat...
NumCoreThreads	20
NumCoreThreadsBusy	0
NumMessagesProcessed	23696
Running	true
ShortestExecuteTime	0
ShortestQueueTime	0

Monitoring a Message Queue

For monitoring a message queue, click the MBeans tab on the Java console, and then choose **MessageQueue > Attributes** from the tree to view the attribute values associated with the message queues.

Figure 1-12 Monitoring a message queue

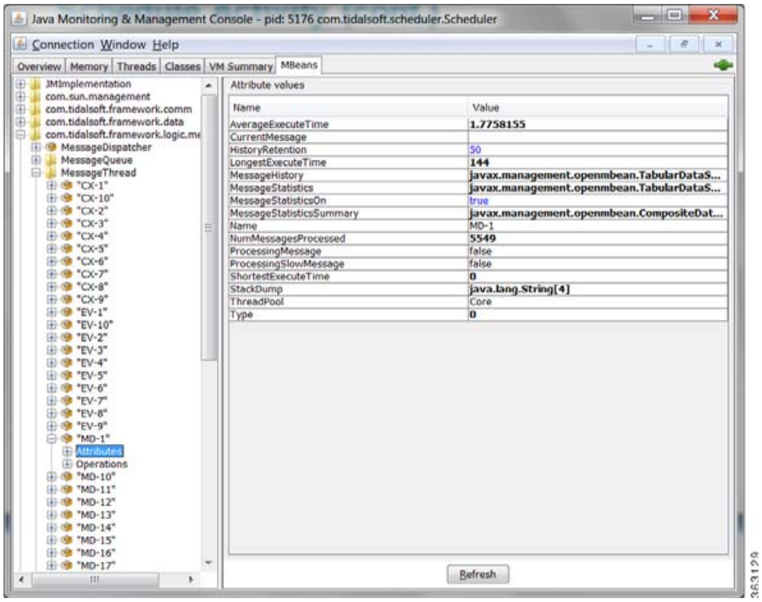


Name	Value
AverageQueueTime	317.07425
Description	Queue for normal messages processing.
HighPriority	false
HistoryRetention	50
LastProcessedTime	Wed Sep 22 11:49:42 PDT 2010
LongestQueueTime	1812
MessageBurstSize	150
MessageCount	0
MessageHistory	javax.management.openmbean.TabularDataS...
MessageStatistics	javax.management.openmbean.TabularDataS...
MessageStatisticsOn	true
MessageStatisticsSummary	javax.management.openmbean.CompositeDat...
Messages	javax.management.openmbean.TabularDataS...
NumMessagesPosted	19
NumMessagesProcessed	23329
Priority	10
ShortestQueueTime	0
ThreadPool	Core

Monitoring a Message Thread

For monitoring a message thread, click the MBeans tab on the Java console, and then choose **MessageThread > threadname > Attributes** from the tree to view the attribute values associated with the message thread.

Figure 1-13 Monitoring a Message Thread



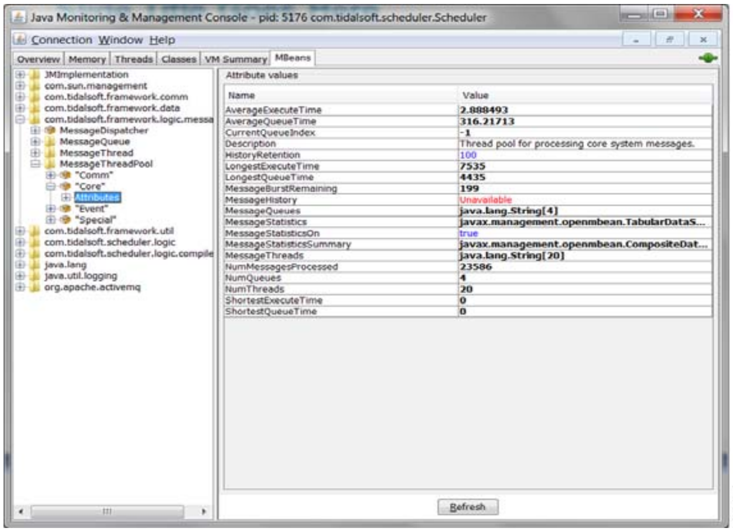
Attribute values

Name	Value
AverageExecuteTime	1.7758155
CurrentMessage	
HistoryRetention	50
LongestExecuteTime	144
MessageHistory	javax.management.openmbean.TabularDataS...
MessageStatistics	javax.management.openmbean.TabularDataS...
MessageStatisticsOn	true
MessageStatisticsSummary	javax.management.openmbean.CompositeDat...
Name	MD-1
NumMessagesProcessed	5549
ProcessingMessage	false
ProcessingSlowMessage	false
ShortestExecuteTime	0
StackDump	java.lang.String[4]
ThreadPool	Core
Type	0

Monitoring a Message Thread Pool

For monitoring a message thread pool, click the MBeans tab on the Java console, and then choose **MessageThreadPool > poolname > Attributes** from the tree to view the attribute values associated with the message thread pool.

Figure 1-14 Monitoring a Message Thread Pool



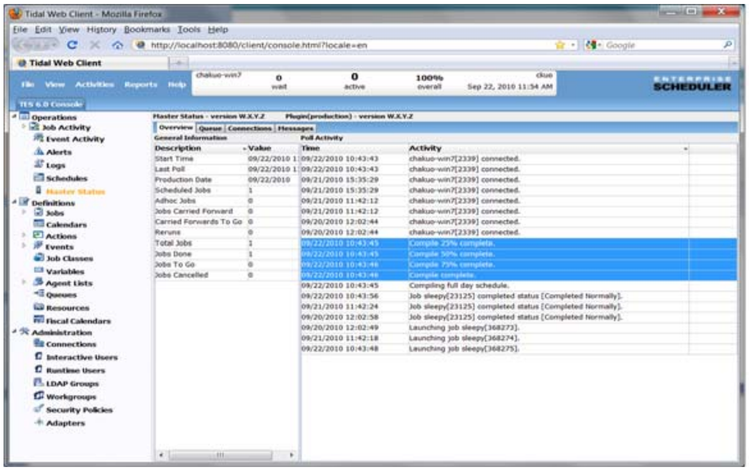
Name	Value
AverageExecuteTime	2.888493
AverageQueueTime	316.21713
CurrentQueueIndex	-1
Description	Thread pool for processing core system messages.
HistoryRetention	100
LongestExecuteTime	7535
LongestQueueTime	4435
MessageBurstRemaining	199
MessageHistory	Unavailable
MessageQueues	java.lang.String[4]
MessageStatistics	javax.management.openmbean.TabularDataS...
MessageStatisticsOn	true
MessageStatisticsSummary	javax.management.openmbean.CompositeDat...
MessageThreads	java.lang.String[20]
NumMessagesProcessed	23586
NumQueues	4
NumThreads	20
ShortestExecuteTime	0
ShortestQueueTime	0

Monitoring Schedule Compiling

Master Status-Compile Status

For monitoring the master compile status, choose **Operations > Master Status** from the Navigation tree to view the Master Status pane, and then click **Overview**. You can view the compile percentage in the Poll Activity pane as displayed below.

Figure 1-15 Viewing the Master compile status



General Information

Description	Value
Start Time	09/22/2010 1
Last Poll	09/22/2010 1
Production Date	09/22/2010
Scheduled Jobs	1
Adhoc Jobs	0
Jobs Carried Forward	0
Carried Forwards To Go	0
Reruns	0
Total Jobs	1
Jobs Done	1
Jobs To Go	0
Jobs Cancelled	0

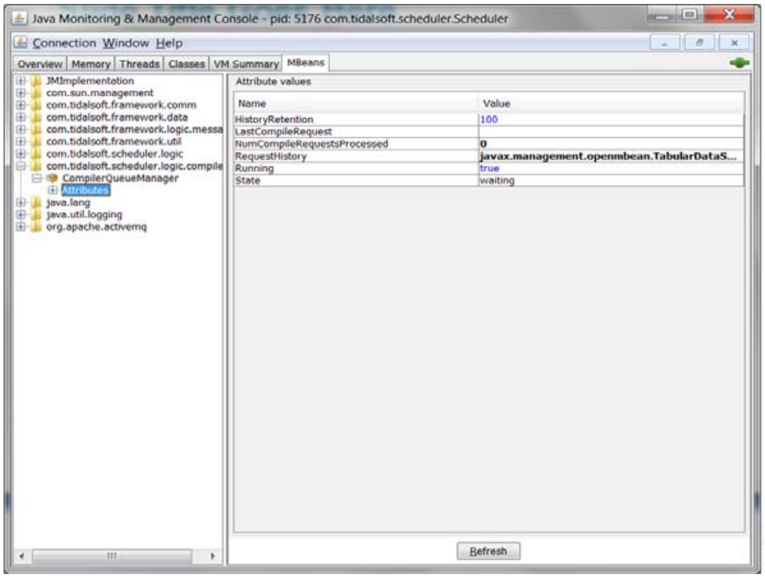
Poll Activity

Time	Activity
09/22/2010 10:43:43	chakuo-win7[2339] connected.
09/22/2010 10:43:43	chakuo-win7[2339] connected.
09/21/2010 15:35:29	chakuo-win7[2339] connected.
09/21/2010 15:35:29	chakuo-win7[2339] connected.
09/21/2010 11:42:12	chakuo-win7[2339] connected.
09/21/2010 11:42:12	chakuo-win7[2339] connected.
09/20/2010 12:02:44	chakuo-win7[2339] connected.
09/20/2010 12:02:44	chakuo-win7[2339] connected.
09/22/2010 10:43:45	Compile 25% complete.
09/22/2010 10:43:45	Compile 50% complete.
09/22/2010 10:43:46	Compile 75% complete.
09/22/2010 10:43:46	Compile complete.
09/22/2010 10:43:45	Compiling full day schedule.
09/22/2010 10:43:56	Job sleepy[23125] completed status [Completed Normally].
09/21/2010 11:42:24	Job sleepy[23125] completed status [Completed Normally].
09/20/2010 12:02:58	Job sleepy[23125] completed status [Completed Normally].
09/20/2010 12:02:49	Launching job sleepy[368273].
09/21/2010 11:42:18	Launching job sleepy[368274].
09/22/2010 10:43:48	Launching job sleepy[368275].

Monitoring the Queue Manager Compiler

For monitoring the queue manager compiler, select the MBeans tab on the Java console, and then select **CompilerQueueManager > Attributes** from the tree to view the attribute values associated with the queue manager compiler.

Figure 1-16 Monitoring the queue manager compiler

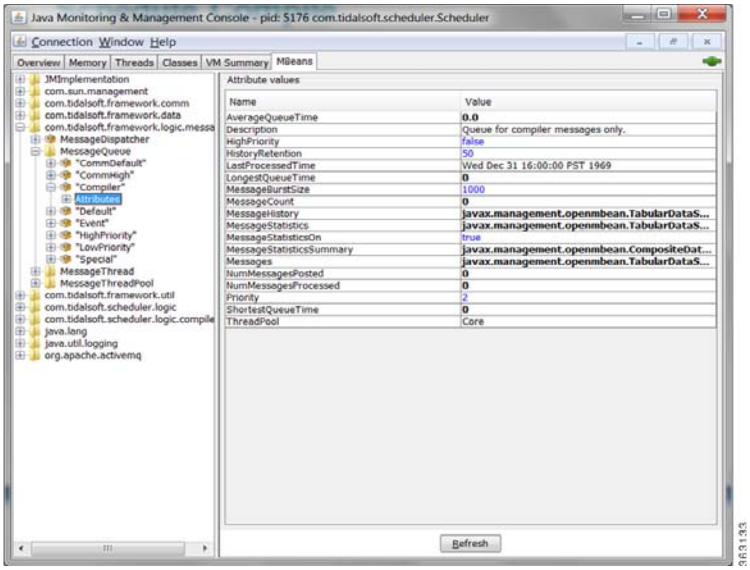

Java Monitoring & Management Console - pid: 5176 com.tidalsoft.scheduler.Scheduler
Connection Window Help
Overview
Memory
Threads
Classes
VM Summary
MBeans
JMImplementation
com.sun.management
com.tidalsoft.framework.comm
com.tidalsoft.framework.data
com.tidalsoft.framework.logic.messa
com.tidalsoft.framework.util
com.tidalsoft.scheduler.logic
com.tidalsoft.scheduler.logic.compile
CompilerQueueManager
Attributes
java.lang
java.util.logging
org.apache.activemq
Attribute values
Refresh
363134

Name	Value
HistoryRetention	100
LastCompileRequest	
NumCompileRequestsProcessed	0
RequestHistory	javax.management.openmbean.TabularDataS...
Running	true
State	waiting

Monitoring the Message Queue Compiler

For monitoring the queue message compiler, select the MBeans tab on the Java console, and then choose **MessageQueue > Attributes** from the tree to view the attribute values associated with the queue message compiler.

Figure 1-17 Monitoring the message queue compiler



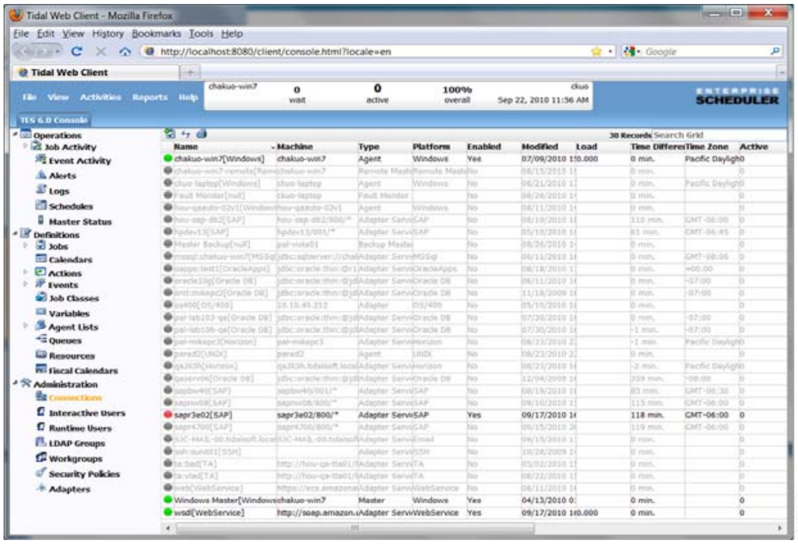
Name	Value
AverageQueueTime	0.0
Description	Queue for compiler messages only.
HighPriority	false
HistoryRetention	50
LastProcessedTime	Wed Dec 31 16:00:00 PST 1969
LongestQueueTime	0
MessageBurstSize	1000
MessageCount	0
MessageHistory	javax.management.openmbean.TabularDataS...
MessageStatistics	javax.management.openmbean.TabularDataS...
MessageStatisticsOn	true
MessageStatisticsSummary	javax.management.openmbean.CompositeDat...
Messages	javax.management.openmbean.TabularDataS...
NumMessagesPosted	0
NumMessagesProcessed	0
Priority	2
ShortestQueueTime	0
ThreadPool	Core

Monitoring Adapter/Agent Connections

Viewing All Connections and Statuses

To view all connections and their statuses, choose **Administration > Connections** from the Navigation tree to view the Connections pane.

Figure 1-18 Viewing All Connections and their statuses

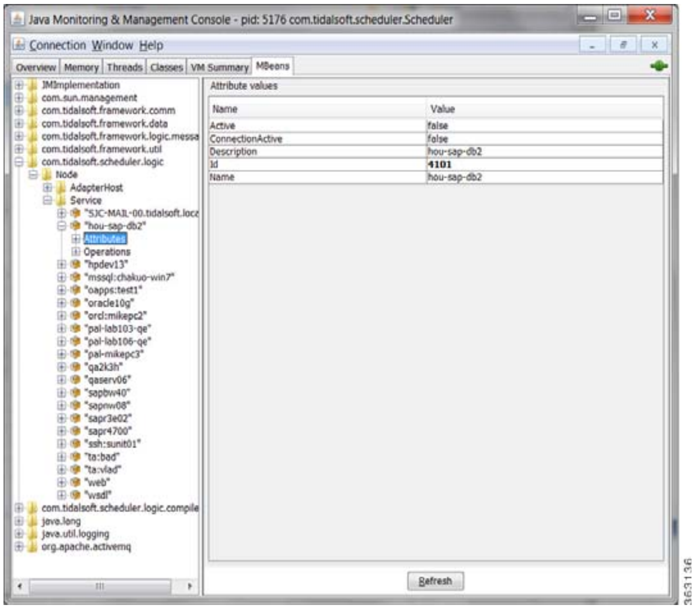


Name	Machine	Type	Platform	Enabled	Modified	Load	Time Differe	Time Zone	Active
chakuo-win7[Windows]	chakuo-win7	Agent	Windows	Yes	07/09/2010 1	0.000	0 min.	Pacific Daylight	0
chakuo-win7-remote[Rem	chakuo-win7	Remote Mast	Remote Mast	No	08/15/2010 1		0 min.		0
cluo-laptop[Windows]	cluo-laptop	Agent	Windows	No	06/21/2010 1		0 min.	Pacific Daylight	0
Fault Monitor[null]	cluo-laptop	Fault Monitor		No	08/26/2010 1		0 min.		0
hou-qaauto-02v1[Window	hou-qaauto-02v1	Agent	Windows	No	08/11/2010 1		0 min.		0
hou-sap-db2[SAP]	hou-sap-db2/800/*	Adapter Servi	SAP	No	08/19/2010 1		110 min.	GMT-06:00	0
hpdev13[SAP]	hpdev13/001/*	Adapter Servi	SAP	No	05/18/2010 1		61 min.	GMT-06:45	0
Master Backup[null]	pal-vista01	Backup Maste		No	08/26/2010 1		0 min.		0
mssql:chakuo-win7[MSSql	jdbc:sqlserver://chal	Adapter Servi	MSSql	No	06/11/2010 1		0 min.	GMT-08:00	0
oapps:test1[OracleApps]	jdbc:oracle:thin:@r1	Adapter Servi	OracleApps	No	08/18/2010 1		0 min.	+00:00	0
oracle10g[Oracle DB]	jdbc:oracle:thin:@jd	Adapter Servi	Oracle DB	No	06/11/2010 1		0 min.	-07:00	0
ord:mikepc2[Oracle DB]	jdbc:oracle:thin:@jd	Adapter Servi	Oracle DB	No	11/18/2009 1		0 min.	-07:00	0
os400[OS/400]	10.10.40.212	Adapter	OS/400	No	05/10/2010 1		0 min.		0
pal-lab102-qa[Oracle DB]	jdbc:oracle:thin:@jd	Adapter Servi	Oracle DB	No	07/20/2010 1		0 min.	-07:00	0
pal-lab106-qa[Oracle DB]	jdbc:oracle:thin:@jd	Adapter Servi	Oracle DB	No	07/30/2010 1		-1 min.	-07:00	0
pal-mikepc3[Horizon]	pal-mikepc3	Adapter Servi	Horizon	No	08/23/2010 2		-1 min.	Pacific Daylight	0
pared2[UNIX]	pared2	Agent	UNIX	No	08/23/2010 2		0 min.		0
qa2k3h[Horizon]	qa2k3h.tidalsoft.local	Adapter Servi	Horizon	No	08/23/2010 1		-2 min.	Pacific Daylight	0
qaserv06[Oracle DB]	jdbc:oracle:thin:@jd	Adapter Servi	Oracle DB	No	12/04/2009 1		359 min.	-08:00	0
sapbw40[SAP]	sapbw40/001/*	Adapter Servi	SAP	No	08/19/2010 1		85 min.	GMT-06:30	0
saprw08[SAP]	saprw08/800/*	Adapter Servi	SAP	No	09/10/2010 1		115 min.	GMT-06:00	0
sapr3e02[SAP]	sapr3e02/800/*	Adapter Servi	SAP	Yes	09/17/2010 1		118 min.	GMT-06:00	0
sapr4700[SAP]	sapr4700/800/*	Adapter Servi	SAP	No	09/15/2010 2		119 min.	GMT-06:00	0
SJC-MAIL-00.tidalsoft.local	SJC-MAIL-00.tidalsoft	Adapter Servi	Email	No	09/15/2010 1		0 min.		0
ssh:sun01[SSH]		Adapter Servi	SSH	No	10/28/2009 1		0 min.		0
ta:bad[TA]	http://hou-qa-tta01/T	Adapter Servi	TA	No	05/02/2010 1		0 min.		0
ta:vlad[TA]	http://hou-qa-tta01/T	Adapter Servi	TA	No	08/22/2010 1		0 min.		0
web[WebService]	https://ecs.amazona	Adapter Servi	WebService	No	04/11/2010 1		0 min.		0
Windows Master[Windows	chakuo-win7	Master	Windows	Yes	04/13/2010 0		0 min.		0
wsdl[WebService]	http://soap.amazon.u	Adapter Servi	WebService	Yes	09/17/2010 1	0.000	0 min.		0

Monitoring Adapter Connections via JConsole

For monitoring the adapter connections, select the **MBeans** tab on the Java console, and then choose **Node > Service > Attributes** from the tree to view the attribute values associated with the adapter connection.

Figure 1-19 Viewing adapter connections via JConsole



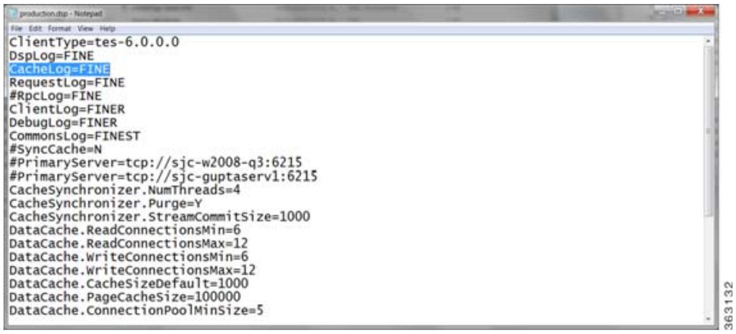
Attribute values

Name	Value
Active	false
ConnectionActive	false
Description	hou-sap-db2
Id	4101
Name	hou-sap-db2

Monitoring the Cache Sync

To monitor the Cache sync, open *DSP.props* and set the cache logging level to FINE as displayed below.

Figure 1-20 Monitoring the Cache sync

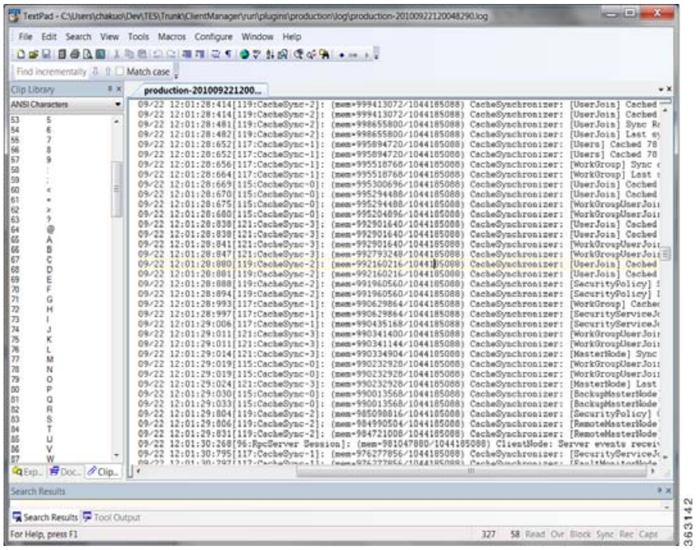


```
ClientType=tes-6.0.0.0
DspLog=FINE
CacheLog=FINE
RequestLog=FINE
#RpcLog=FINE
ClientLog=FINER
DebugLog=FINER
CommonsLog=FINEST
#SyncCache=N
#PrimaryServer=tcp://sjc-w2008-q3:6215
#PrimaryServer=tcp://sjc-guptaserv1:6215
CacheSynchronizer.NumThreads=4
CacheSynchronizer.Purge=Y
CacheSynchronizer.StreamCommitSize=1000
DataCache.ReadConnectionsMin=6
DataCache.ReadConnectionsMax=12
DataCache.WriteConnectionsMin=6
DataCache.WriteConnectionsMax=12
DataCache.CacheSizeDefault=1000
DataCache.PageCacheSize=100000
DataCache.ConnectionPoolMinSize=5
```

Viewing the Cache Sync Logging

To view the Cache sync logging, open the log file located in the *Log* folder.

Figure 1-21 Viewing the Cache sync logging

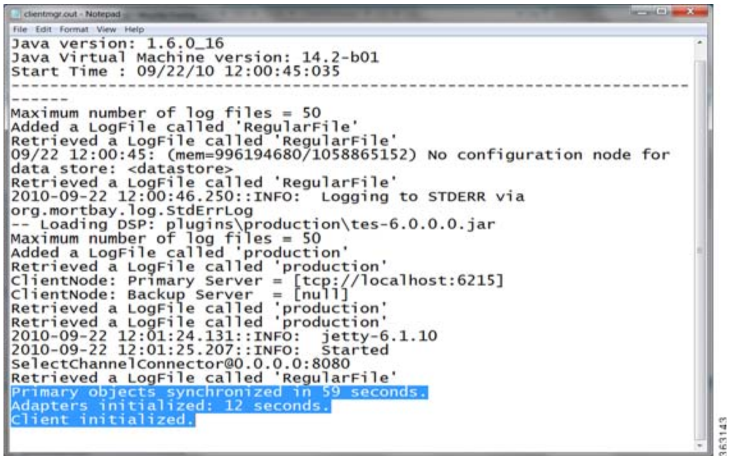

TextPad - C:\Users\chakuo\Dev\TES\Trunk\ClientManager\run\plugins\production\log\production-20100922120048290.log
File Edit Search View Tools Macros Configure Window Help
Find incrementally
Match case
Clip Library
ANSI Characters
production-201009221200...
Exp...
Doc...
Clip...
Search Results
Search Results
Tool Output
For Help, press F1
327 58 Read Ovr Block Sync Rec Caps
363142

```
09/22 12:01:28:414[119:CacheSync-2]: (mem=999413072/1044185088) CacheSynchronizer: [UserJoin] Cached
09/22 12:01:28:414[119:CacheSync-2]: (mem=999413072/1044185088) CacheSynchronizer: [UserJoin] Cached
09/22 12:01:28:481[119:CacheSync-2]: (mem=998655800/1044185088) CacheSynchronizer: [UserJoin] Sync R
09/22 12:01:28:482[119:CacheSync-2]: (mem=998655800/1044185088) CacheSynchronizer: [UserJoin] Last sy
09/22 12:01:28:652[117:CacheSync-1]: (mem=995894720/1044185088) CacheSynchronizer: [Users] Cached 78
09/22 12:01:28:652[117:CacheSync-1]: (mem=995894720/1044185088) CacheSynchronizer: [Users] Cached 78
09/22 12:01:28:656[117:CacheSync-1]: (mem=995518768/1044185088) CacheSynchronizer: [WorkGroup] Sync c
09/22 12:01:28:664[117:CacheSync-1]: (mem=995518768/1044185088) CacheSynchronizer: [WorkGroup] Last s
09/22 12:01:28:669[115:CacheSync-0]: (mem=995300696/1044185088) CacheSynchronizer: [UserJoin] Cached
09/22 12:01:28:670[115:CacheSync-0]: (mem=995294488/1044185088) CacheSynchronizer: [UserJoin] Cached
09/22 12:01:28:675[115:CacheSync-0]: (mem=995294488/1044185088) CacheSynchronizer: [WorkGroupUserJoi
09/22 12:01:28:680[115:CacheSync-0]: (mem=995204896/1044185088) CacheSynchronizer: [WorkGroupUserJoi
09/22 12:01:28:838[121:CacheSync-3]: (mem=992901640/1044185088) CacheSynchronizer: [UserJoin] Cached
09/22 12:01:28:838[121:CacheSync-3]: (mem=992901640/1044185088) CacheSynchronizer: [UserJoin] Cached
09/22 12:01:28:841[121:CacheSync-3]: (mem=992901640/1044185088) CacheSynchronizer: [WorkGroupUserJoi
09/22 12:01:28:847[121:CacheSync-3]: (mem=992793248/1044185088) CacheSynchronizer: [WorkGroupUserJoi
09/22 12:01:28:880[119:CacheSync-2]: (mem=992160216/1044185088) CacheSynchronizer: [UserJoin] Cached
09/22 12:01:28:881[119:CacheSync-2]: (mem=992160216/1044185088) CacheSynchronizer: [UserJoin] Cached
09/22 12:01:28:888[119:CacheSync-2]: (mem=991960560/1044185088) CacheSynchronizer: [SecurityPolicy] S
09/22 12:01:28:894[119:CacheSync-2]: (mem=991960560/1044185088) CacheSynchronizer: [SecurityPolicy] I
09/22 12:01:28:993[117:CacheSync-1]: (mem=990629864/1044185088) CacheSynchronizer: [WorkGroup] Cache
09/22 12:01:28:997[117:CacheSync-1]: (mem=990629864/1044185088) CacheSynchronizer: [SecurityServiceJ
09/22 12:01:29:006[117:CacheSync-1]: (mem=990435168/1044185088) CacheSynchronizer: [SecurityServiceJ
09/22 12:01:29:011[121:CacheSync-3]: (mem=990341400/1044185088) CacheSynchronizer: [WorkGroupUserJoi
09/22 12:01:29:011[121:CacheSync-3]: (mem=990341144/1044185088) CacheSynchronizer: [WorkGroupUserJoi
09/22 12:01:29:014[121:CacheSync-3]: (mem=990334904/1044185088) CacheSynchronizer: [MasterNode] Sync
09/22 12:01:29:019[115:CacheSync-0]: (mem=990232928/1044185088) CacheSynchronizer: [WorkGroupUserJoi
09/22 12:01:29:019[115:CacheSync-0]: (mem=990232928/1044185088) CacheSynchronizer: [WorkGroupUserJoi
09/22 12:01:29:024[121:CacheSync-3]: (mem=990232928/1044185088) CacheSynchronizer: [MasterNode] Last
09/22 12:01:29:030[115:CacheSync-0]: (mem=990013568/1044185088) CacheSynchronizer: [BackupMasterNode
09/22 12:01:29:033[115:CacheSync-0]: (mem=990013568/1044185088) CacheSynchronizer: [BackupMasterNode
09/22 12:01:29:804[119:CacheSync-2]: (mem=985098816/1044185088) CacheSynchronizer: [SecurityPolicy] (
09/22 12:01:29:806[119:CacheSync-2]: (mem=984990504/1044185088) CacheSynchronizer: [RemoteMasterNode
09/22 12:01:29:831[119:CacheSync-2]: (mem=984721008/1044185088) CacheSynchronizer: [RemoteMasterNode
09/22 12:01:30:268[96:RpcServer Session]: (mem=981047880/1044185088) ClientNode: Server events recei
09/22 12:01:30:795[117:CacheSync-1]: (mem=976277856/1044185088) CacheSynchronizer: [SecurityServiceJ
```

Viewing the Client Manager Output Log

To view the Client Manager output, open the *clientmgr.out* log file located in the *Log* folder.

Figure 1-22 Viewing the Client Manager Output



```
Java version: 1.6.0_16
Java Virtual Machine version: 14.2-b01
Start Time : 09/22/10 12:00:45:035
--------------------------------------------------------------------
------
Maximum number of log files = 50
Added a LogFile called 'RegularFile'
Retrieved a LogFile called 'RegularFile'
09/22 12:00:45: (mem=996194680/1058865152) No configuration node for
data store: <datastore>
Retrieved a LogFile called 'RegularFile'
2010-09-22 12:00:46.250::INFO:  Logging to STDERR via
org.mortbay.log.StdErrLog
-- Loading DSP: plugins\production\tes-6.0.0.0.jar
Maximum number of log files = 50
Added a LogFile called 'production'
Retrieved a LogFile called 'production'
ClientNode: Primary Server = [tcp://localhost:6215]
ClientNode: Backup Server  = [null]
Retrieved a LogFile called 'production'
Retrieved a LogFile called 'production'
2010-09-22 12:01:24.131::INFO:  jetty-6.1.10
2010-09-22 12:01:25.207::INFO:  Started
SelectChannelConnector@0.0.0.0:8080
Retrieved a LogFile called 'RegularFile'
Primary objects synchronized in 59 seconds.
Adapters initialized: 12 seconds.
Client initialized.
```

Configuration and Tuning

This section will walk you through how to tune the application (either Master or Client Manager) to get better performance.

Memory

These parameters tune the amount of memory the application has to use to get work done. If an application does not have enough memory to work with, it could have very poor performance or in the worst case get out of memory errors and fail.

The following parameters apply to all Java applications:

- -Xmn = size of young generation (1/4 size of heap)
- -Xmx = max heap size
- -Xms = initial heap size (guarantees JVM has that much memory)
- -Xss = thread stack size (increase if getting stack overflow exceptions)
- JVMARGS=-Xmn1024m -Xms28672m -Xmx28672m

CPU

The system CPU is not readily tunable from our application or the JVM itself, however, know that the CPU is an important resource that directly impacts performance. If a system does not have enough CPUs or CPU power, applications can run very slowly across the board. Upgrade your system to more CPUs or faster CPUs if the system monitor consistently shows the CPU meter very high.

JMS

Both the Master and Client Manager rely on the Java Message Service (JMS) for internal and cross communication with each other. You can think of JMS as the communication link between the Master and Client Manager. That is why JMS can greatly impact performance, especially if there is a lot of data moving back and forth between the Master and Client Manager., such as the primary and secondary cache synchronization.

JMS sessions process all messages such as during the use of one worker thread per session. The following threads are affected:

- MinSessionPoolSize – minimum number of ActiveMQ sessions kept pooled. Having sessions available to handle requests reduces the cost of allocating sessions on demand.
- MaxSessionPoolSize – maximum number of ActiveMQ sessions kept pooled.

Note If more sessions are needed to process messages, the system will still allocate them. This setting only limits the number of sessions allowed to be pooled.

- MaxConcurrentMessage – maximum number of ActiveMQ messages allowed to be processed concurrently. This setting is important for increasing throughput and utilizing all the cores on a system when there are many messages waiting in the ActiveMQ queues.

The following Message Brokers handle all JMS traffic:

- MessageBroker.MemoryLimit – how much memory (in MB) to allocate to ActiveMQ for storing in-flight messages. If queues become full, ActiveMQ will page messages to disk, which is more expensive than keeping them in memory.
- MessageBroker.TempLimit – how much memory (in MB) to allocate to ActiveMQ for storing temporary messages. If queues become full, ActiveMQ will page messages to disk, which is more expensive than keeping them in memory.
- MessageBroker.StoreLimit – how much disk space (in MB) to allocate to ActiveMQ for storing in-flight messages when memory is full.

The following *master.props* properties are what you would tune for DSP to Master message traffic for ***all*** DSP connections:

- MinSessionPoolSize (5)
- MaxSessionPoolSize (10)
- MaxConcurrentMessages (10)

The following *master.props* properties are what you would tune for DSP to Master message traffic ***per*** DSP connections:

- ClientConnection.MinSessionPoolSize (2)
- ClientConnection.MaxSessionPoolSize (5)
- ClientConnection.MaxConcurrentMessages (5)

The following *master.props* properties are what you would tune for Remote Master to Master message traffic per Remote Master:

- RemoteMasterClient.MinSessionPoolSize (2)
- RemoteMasterClient.MaxSessionPoolSize (5)
- RemoteMasterClient.MaxConcurrentMessages (5)

The following *master.props* properties are what you would tune for Master to Remote Master message traffic per Remote Master:

- RemoteMasterServer.MinSessionPoolSize (2)
- RemoteMasterServer.MaxSessionPoolSize (5)
- RemoteMasterServer.MaxConcurrentMessages (5)

The following *tes-6.0.dsp* properties are what you would tune for Master to DSP message traffic:

- ClientNode.MinSessionPoolSize (5)
- ClientNode.MaxSessionPoolSize (10)
- ClientNode.MaxConcurrentMessages (10)

The following *tes-6.2.dsp* properties are what you would tune for Fault Monitor to DSP message traffic:

- FTNode.MinSessionPoolSize (2)
- FTNode.MaxSessionPoolSize (5)
- FTNode.MaxConcurrentMessages (5)The following *tes-6.2.dsp* properties are what you would tune for Cache Read connections shared among all threads:
- DataCache.ReadConnectionsMin (2) – minimum number of JDBC connections kept pooled to read from the data cache. Having connections always available to handle read requests reduces the cost of allocating connections on demand.
- DataCache.ReadConnectionsMax (4) – maximum number of JDBC connections allowed to be allocated concurrently to read from the data cache. If this number is exceeded, read requests will be queued and blocked. Recommend increasing to handle more concurrent users.

The following *tes-6.2.dsp* properties are what you would tune for Cache Write connections shared among all threads:

- DataCache.WriteConnectionsMin (4) – minimum number of JDBC connections kept pooled to write to the data cache. Having connections always available to handle write requests reduces the cost of allocating connections on demand.
- DataCache.WriteConnectionsMax (8) – maximum number of JDBC connections allowed to be allocated concurrently to write to the data cache. If this number is exceeded, write request will be queued and blocked. Recommend increasing to handle more data update activity between the Master and DSP.

The following *tes-6.2.dsp* properties are what you would tune for Cache Tuning tradeoff between performance and memory/disk usage:

- DataCache.PageCacheSize (50000) – number of pages (of size DataCache.PageSize) in memory allocated to the data cache. The in-memory data cache allows for the fastest possible read/write access. Thus, for very large data caches, it is recommended that the data cache be given as much memory as possible.
- DataCache.PageSize (4096) – size (in bytes) of each page in the data cache. The data cache stores records in page-size chunks. Larger pages may improve read/write access when the data cache needs to fetch records from disk, with the added cost of a larger data cache in-memory and on disk. Another factor to keep in mind is the OS disk block size. Usually, it is recommended to keep the data cache page size the same as the OS disk block size.
- DataCache.CacheSizeDefault (1000) – number of objects each table in the data cache is allowed to keep in memory. More objects equals faster read/write access from and to the data cache.

The following *tes-6.2.dsp* properties are what you would tune for Cache Syncing, which affects the data sync between the master database and Client Manager (DSP) cache.

- CacheSynchronizer.Purge (N) – Y to purge leftover deleted records during sync. Leftover records may exist in the cache if the Master deletes the records from its database when the Client Manager is not connected.
- CacheSynchronizer.NumThreads (4) – number of concurrent threads spawned to sync the cache. More threads increase throughput, but use more CPU and memory. Recommend to set at or below number of physical cores on machine.
- CacheSynchronizer.StreamCommitSize (1000) – number of records committed to the cache in a batch. Larger batches improve throughput, but use more memory.

The following *master.props* properties are what you would tune for the connections used to read/write to the master database:

- Shared between normal master operation PLUS cache sync (both can be high I/O).
- Each CM can configure X number of sync threads = Master needs X number of DB connections.
- DatabaseConnections (20)

Master Messaging

Master messaging impacts only the Master, but it has a big impact on the performance of the Master and thus indirectly the Client Manager as well. The Master is designed to be a heavily multi-threaded application. By tuning the messaging parameters, the Master is bettter able to utilize the threading capabilities of the system.

All work in the Master is performed by the following message threads:

- Message Queues

  Before a message is sent to an object, it is first posted to one of the application's message queues. Each queue or set of queues is allocated for a specific type of message. For example, the default queues are for general messages, the compiler queue is for compile messages, and the communication queues are for communication messages. Each queue has a priority that determines how often its messages get processed. Higher priority queues have their messages processed more frequently than lower priority ones.

- Message Threads

  Message threads are the workhorse of the application. They are responsible for pulling messages out of queues and then executing them. Depending on the application configuration, there may be anywhere from a dozen to a hundred threads running inside the application. Generally speaking, more threads equal better performance, since each CPU can execute a thread at the same time as another CPU. So, technically, a dual core system can process twice as many messages as a single core system. However, in reality, because each thread eats up a bit of memory and CPU, performance is expected to degrade when there are too many threads for the system to handle.

- Message Thread Pools

  A message thread pool groups together a set of messages threads with a set of message queues. The intent is to force threads from a pool to only process messages for queues from the same pool. This guarantees if threads in one pool are busy, messages in another pool will still get processed by free threads in that pool.

To configure the Master messaging:

- MessageThreads = general workhorse threads
- SpecialMessageThreads = adapter-related threads
- EventMessageThreads = event-related threads

- CommThreads = communication threads

Note As a best practice, retain no more than 20 M message log records for better performance.

Transporter Performance

Transporter Job Read Options

Configurations have been made available to provide improved performance for unfiltered job reads. Multiple options are available for flexibility. Configuring these options may require tuning based on the customer environment. For tuning purpose, it would best to run TP in debug mode with an open console so that you can view how the reads are performing.

To run TP in debug mode, include **XPORTER_DEBUG=YES** in the Transporter.props file and run the **transporter.cmd** script located in bin.

The REST call job.getList has been replaced with the following options:

Parameters Configured via Transporter.props

Only one of the following parameters should be set to true at a time:

- READJOBS_PAGINATED
- READJOBS_ALL
- READJOBS_BATCHES

The READ_BATCHES parameter applies to READJOBS_PAGINATED or READJOBS_BATCHES.

If none of these parameters is set, the default configuration for read is (READ_BATCHES=500, READJOBS_BATCHES=true)

The READ_BATCHES parameter is used when reading paginated or batched reads.

The READJOBS_PAGINATED parameter determines whether to read jobs in pages.

The READJOBS_BATCHES parameter determines whether to read jobs in batches.

The READJOBS_ALL parameter determines whether to read all, given the min and max job ID.

READJOBS_PAGINATED

READJOBS_PAGINATED configures the client manager to return job data in pages, with the batches based on the READ_BATCHES value.

For example, READ_BATCHES=1000 and READJOBS_PAGINATED=true, tells the Client Manager to return job data in batches of 1000. This approach reduces the overhead on the Client Manager as data is sent in smaller batches. Increasing the READ_BATCHES value will reduce the number of requests sent to the Client Manager since the jobs are returned in larger batches.

Note This approach may have less benefit given many jobs (i.e. 50K or more). The batching is done at the Client Manager level.

READJOBS_BATCHES

READJOBS_BATCHES reads jobs based on a given range of job IDs, where the range is specified via READ_BATCHES.

For example, if you have 50,000 job records whose job IDs start at 1 and ends at 50000, and you have set READ_BATCHES=1000 and READJOBS_BATCHES=true, requests will be sent to the Client Manager to query job records in ranges, until no more records are returned, as follows.

```
jobid >=1        and jobid <=1001
jobid >=1002 and jobid <= 2002
jobid >=2003 and jobid <= 3003
…
```

If all the job IDs are sequential and start at 1, then each batch request will result in roughly 1000 records. However, if there are large gaps in the job IDs, due to mass job deletes for example, the request may return fewer results depending on where the job record ID falls in that range. While executing the read and running Transporter in the debug mode, if you find that very few or 0 records are returned given a READ_BATCHES configuration, then increasing this value will be necessary to reduce the number of requests that return 0 or few results.

Note This approach appears to be more beneficial when there are many job records (50K or more).

READJOBS_ALL

READJOBS_ALL reads all jobs based on the first and last job ID. The result is that all jobs will be read in a single request. This approach is different from the job.getList call in that while both return all jobs, this request adds a query condition to the request, which seems to produce better performance. However, because all records are returned in a single request, the Client Manager will need to process all the records to send to Transporter.

Note If there are many job records, the overhead on the Client Manager may be too high.

General Best Practices

Consider the following best practices while using the Transporter:

- Use server-side filter to read specific jobs.
- Run only one instance of transporter at a time in a machine.
- Have less number of top level groups.
- Transport during off peak hours or when client manager usage is significantly less.

Size-Based Guidelines for Tuning Your Environments

Small, medium, and large configurations require parameters to be tuned differently. Set the parameters as indicated in this section.

Small Configuration

tes-6.0.0.0.dsp

CacheSynchronizer.NumThreads=2

DataCache.ReadConnectionsMin=5

DataCache.ReadConnectionsMax=10

DataCache.WriteConnectionsMin=5

DataCache.WriteConnectionsMax=10

```
DataCache.PageCacheSize=16384
DataCache.ConnectionPoolMinSize=5
DataCache.ConnectionPoolMaxSize=10
DataCache.StatementCacheSize=750
ClientNode.MinSessionPoolSize=5
ClientNode.MaxSessionPoolSize=10
ClientNode.MaxConcurrentMessages=10
```

clientmgr.props

```
JVMARGS=-Xms2048m –Xmx8192m -XX:PermSize=1024m -XX:MaxPermSize=1024m
ClientSession.MinSessionPoolSize=5
ClientSession.MaxSessionPoolSize=10
ClientSession.MaxConcurrentMessages=10
DataSource.MinSessionPoolSize=5
DataSource.MaxSessionPoolSize=10
DataSource.MaxConcurrentMessages=10
```

master.props

```
MessageBroker.MemoryLimit=2048
MessageBroker.StoreLimit=32768
MinSessionPoolSize=250
MaxSessionPoolSize=2500
MaxConcurrentMessages=1
ClientConnection.MinSessionPoolSize=10
ClientConnection.MaxSessionPoolSize=50
ClientConnection.MaxConcurrentMessages=1
```

transporter.cmd

JVM Args: -Xms1024m –Xmx4096m

transporter.props

```
READJOBS_PAGINATED=true
READJOBS_BATCHES=false
READJOBS_ALL=false
READ_BATCHES=10000
XPORTER_DEBUG=YES
```

Medium Configuration

tes-6.0.0.0.dsp

```
CacheSynchronizer.NumThreads=4
DataCache.ReadConnectionsMin=10
DataCache.ReadConnectionsMax=20
DataCache.WriteConnectionsMin=10
DataCache.WriteConnectionsMax=20
DataCache.PageCacheSize=131072
DataCache.ConnectionPoolMinSize=10
DataCache.ConnectionPoolMaxSize=20
DataCache.StatementCacheSize=1500
ClientNode.MinSessionPoolSize=10
ClientNode.MaxSessionPoolSize=20
ClientNode.MaxConcurrentMessages=10
```

clientmgr.props

```
JVMARGS=-Xms4096m –Xmx20480m -XX:PermSize=2048m -XX:MaxPermSize=2048m
ClientSession.MinSessionPoolSize=10
ClientSession.MaxSessionPoolSize=20
ClientSession.MaxConcurrentMessages=10
DataSource.MinSessionPoolSize=10
DataSource.MaxSessionPoolSize=20
DataSource.MaxConcurrentMessages=10
```

master.props

```
MessageBroker.MemoryLimit=512
MessageBroker.StoreLimit=65536
MinSessionPoolSize=500
MaxSessionPoolSize=5000
MaxConcurrentMessages=1
ClientConnection.MinSessionPoolSize=10
ClientConnection.MaxSessionPoolSize=100
ClientConnection.MaxConcurrentMessages=1
```

transporter.cmd

JVM Args: -Xms3072m –Xmx10240m

transporter.props

```
READJOBS_PAGINATED=true
```

```
READJOBS_BATCHES=false
READJOBS_ALL=false
READ_BATCHES=10000
XPORTER_DEBUG=YES
```

Large Configuration

tes-6.0.0.0.dsp

```
CacheSynchronizer.NumThreads=8
DataCache.ReadConnectionsMin=50
DataCache.ReadConnectionsMax=100
DataCache.WriteConnectionsMin=50
DataCache.WriteConnectionsMax=100
DataCache.PageCacheSize=1048576
DataCache.ConnectionPoolMinSize=20
DataCache.ConnectionPoolMaxSize=40
DataCache.StatementCacheSize=7500
ClientNode.MinSessionPoolSize=50
ClientNode.MaxSessionPoolSize=100
ClientNode.MaxConcurrentMessages=10
```

clientmgr.props

```
JVMARGS=-Xms6144m -Xmx24576m -XX:PermSize=3072m -XX:MaxPermSize=3072m
ClientSession.MinSessionPoolSize=50
ClientSession.MaxSessionPoolSize=100
ClientSession.MaxConcurrentMessages=10
DataSource.MinSessionPoolSize=50
DataSource.MaxSessionPoolSize=100
DataSource.MaxConcurrentMessages=10
```

master.props

```
MessageBroker.MemoryLimit=1024
MessageBroker.StoreLimit=65536
MinSessionPoolSize=1000
MaxSessionPoolSize=10000
MaxConcurrentMessages=1
ClientConnection.MinSessionPoolSize=10
ClientConnection.MaxSessionPoolSize=100
ClientConnection.MaxConcurrentMessages=1
```

transporter.cmd

JVM Args: -Xms4096m –Xmx16384m

transporter.props

```
READJOBS_PAGINATED=true
READJOBS_BATCHES=false
READJOBS_ALL=false
READ_BATCHES=10000
XPORTER_DEBUG=YES
```