

Java Troubleshooting with ISA 5 using TMDA

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Lab: Java Troubleshooting with ISA 5 using TMDA

Lab Agenda:

- Part 1: Lab Set Up
- Part 2: IBM Support Assistant 5 Beta
- Part 3: Advanced Javacore Analysis with IBM Thread and Monitor Dump Analyzer Tool
- Part 4: (Optional) Mapping a Thread Id in a Javadump to the output of WebSphere logging or trace

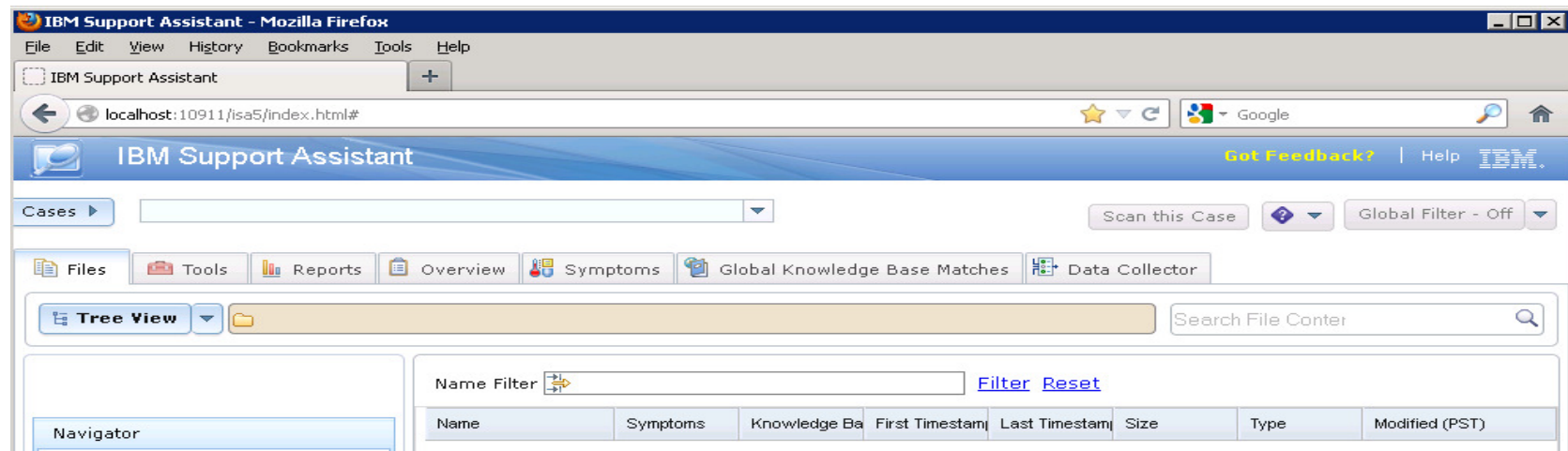
At the end of this lab you should be able to:

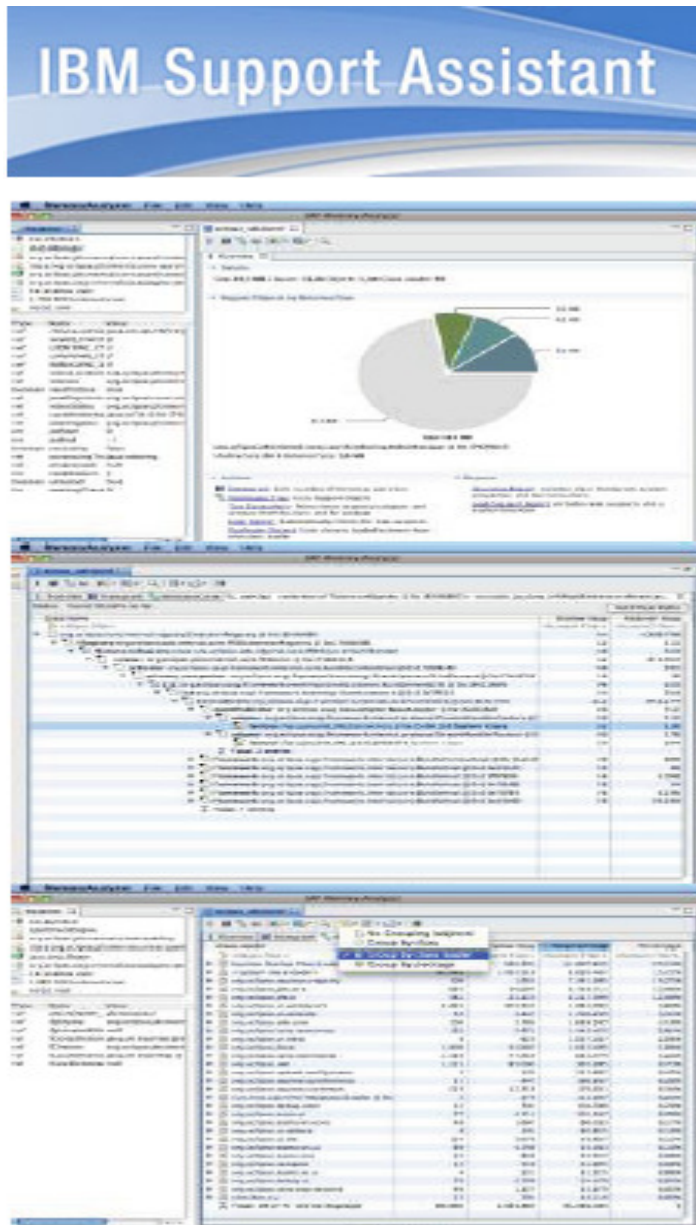
- Use ISA 5 to manage Java diagnostic data and utilize problem determination tools
- Diagnose a hung WebSphere thread using Thread and Monitor Dump Analyzer and Memory Analyzer for Java
- Correlate thread information between WebSphere log, traces, Javadumps and system dumps

IBM Support Assistant (ISA)

The IBM® Support Assistant (ISA) is a free application that provides features for problem determination, and a platform for obtaining diagnostic tools.

- Multi-user automated performance testing tool for Web-based applications
- Brings these capabilities into a server environment. Therefore resources, files, information, and server-level tools can be shared.
- ISA v5.0 can be installed from an EAR file into an existing WebSphere Application Server, or using a simple “all-in-one” unzip install which contains everything required, including a lightweight application server and Java runtime.





Memory Analyzer

- Based on Eclipse project MAT, with some extensions to load IBM dumps
- Overview of the heap dump including size and total number of objects
- Identifies possible memory leaks
- Provides links to continued analysis
 - Path to GC Roots, thread details, the reference chain that prevents an object being garbage collected.
- Dominator tree grouped by class loader:
 - Can scope the analysis to a single application in WebSphere environment
- 64-bit MAT available

Name	State	NativeID	Method
stop_JMX Server on shutdown	Waiting on condition	0xd08	java.lang.Object.wait(Native M...
server.startup : 2	Waiting on condition	0xc90	java.lang.Object.wait(Native M...
file lock watchdog	Waiting on condition	0x4fc	java.lang.Object.wait(Native M...
derby.zawStoreDaemon	Waiting on condition	0x17c	java.lang.Object.wait(Native M...
derby.antiGC	Waiting on condition	0xc64	java.lang.Object.wait(Native M...
Worker-0	Waiting on condition	0xb4	java.lang.Object.wait(Native M...
WebSphere MQ Trace Monitor	Waiting on condition	0xbec	java.lang.Thread.sleep(Nativ...
WebContainer : 5	Waiting on condition	0xc48	org.apache.opinipal.jdbc.Met...
WebContainer : 4	Waiting on condition	0xc0c	com.ibm.io.async.AsyncLibra...
WebContainer : 3	Waiting on condition	0x754	java.util.HashMap.getEntry(H...
WebContainer : 2	Waiting on condition	0xdb0	java.lang.Thread.sleep(Nativ...
WebContainer : 1	Runnable	0xad0	com.ibm.io.async.AsyncLibra...
WebContainer : 0	Waiting on condition	0xad0	java.lang.Object.wait(Native M...
WT-0	Waiting on condition	0x7f8	java.lang.Object.wait(Native M...
WMOJCAResourceAdapter : DMN2	Waiting on condition	0xc8c	java.lang.Object.wait(Native M...
WMOJCAResourceAdapter : DMN1	Waiting on condition	0xd74	java.lang.Object.wait(Native M...
WMOJCAResourceAdapter : DMN0	Waiting on condition	0xd78	java.lang.Object.wait(Native M...
WMMonitorSleeper : 0	Waiting on condition	0x500	java.lang.Object.wait(Native M...
Thread-3	Waiting on condition	0x9c8	java.lang.Object.wait(Native M...
Thread-26	Waiting on condition	0xc9c	java.lang.Object.wait(Native M...
Thread-24	Waiting on condition	0d1c	java.lang.Object.wait(Native M...
Thread-22	Waiting on condition	0bd3c	java.lang.Object.wait(Native M...
Thread-21	Waiting on condition	0xd08	java.lang.Object.wait(Native M...
Thread-20	Waiting on condition	0x5c0	java.lang.Object.wait(Native M...
Thread-19	Waiting on condition	0x76c	java.lang.Object.wait(Native M...
Thread-18	Waiting on condition	0x1fc	java.lang.Object.wait(Native M...
Thread-17	Waiting on condition	0x338	java.lang.Object.wait(Native M...
Thread-16	Parked	0x6c8	sun.misc.Unsafe.park(Native...
Thread-15	Parked	0x2fc	sun.misc.Unsafe.park(Native...
Thread-14	Waiting on condition	0xab4	java.lang.Object.wait(Native M...
Thread-13	Waiting on condition	0x008	java.lang.Object.wait(Native M...

TMDA – Thread and Monitor Dump Analyzer Tool

Cause of thread dump – This helps determine if the JVM experienced a crash or out of memory.

Java Version – The exact java version is displayed making finding IBM fixes easier.

System Classpath & User Arguments – Gives information about the Java environment and its configuration.

Free & Allocated Java Heap Size – Learn if the heap is fully expanded, and what percentage occupied it is.

Thread Status Analysis – Shows the status and number of running threads.

Thread Method Analysis – Shows what code is being executed by each thread at the time of the Javacore

Thread Aggregation Analysis – Gives a summary of the different types of thread that were running at the time of the Javacore

IBM Thread and Monitor Dump Analyzer (TMDA) is a tool to analyze java thread dumps, in order to identify the root cause of hangs, deadlocks, and resource contention or monitor bottlenecks.

What is a Java Thread Dump?

A **javacore** , also known as a **Java™ dump**, **Java™ thread dump** or a **thread dump**, is a file that contains the following sections:

- All of the threads that run on a Java™ Virtual Machine (JVM).
 - All of the monitors on a JVM.
 - Some useful information about the system that the JVM runs under.
 - **Javacore** (IBM SDK)* / **Thread Dump** (Sun / HP)**
- A java dump is very distinct from an operating system core file. A system core is a dump of the entire address space.

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Main Workstation Password:

c4ebwin7

VMware Image Password:

Impact2013AVP

AVP-3225

AVP Sessions in this Room: Venetian - Zeno 4601

- **AVP-3227: WebSphere MQ V7.1 and V7.5: Migration Recommendations and New Features**
 - Session Type: Workshop
 - Date/Time: Wednesday, May 1st /1:00 – 2:00 PM.
- **AVP-3227: WebSphere MQ: Monitoring and Troubleshooting Techniques**
 - Session Type: Workshop
 - Date/Time: Wednesday, May 1st /2:15 – 3:15 PM.
- **AVP-3226: WebSphere V8.5: Migration Recommendations and New Features**
 - Session Type: Workshop
 - Date/Time: Wednesday, May 1st /3:45 - 4:45 PM

Other related sessions

- TAW-1873: Meet the Experts: WAS - Open Questions and Best Practices
 - Wed 02:15 PM - 03:15 PM, San Polo 3401 (Zone D)
- TAW-1871: Meet the Experts: Moving from WAS v6.1 to WAS v8.x
 - Wed 10:15 AM - 11:15 AM, San Polo 3401 (Zone B)
- TAW-1622: WAS Migration - Planning and Best Practices
 - Thu 10:15 AM - 11:15 AM, Room: Palazzo I
- TAW-1626: Hands-On Lab: WAS Migration Tools
 - Wed 03:45 PM - 06:00 PM, Murano 3301B
- TAW-1624: IBM WebSphere Application Server Migration Toolkit
 - Thu 03:45 PM - 04:45 PM, Room: Palazzo H

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