

Introducing the IBM Support Assistant (ISA) for WebSphere on z/OS

John Hutchinson

IBM Washington Systems Center

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Share 114 – Session 1147



SHARE in Seattle

Outline: *ISA Tools for WebSphere on z/OS*

Garbage Collection analysis:

- GC and Memory Visualizer (GCMV) **
- Pattern Modeling Tool for Java GC (PMAT)

Dump analysis:

- Memory Analyzer (MAT) **
- Dump Analyzer **
- HeapAnalyzer
- Memory Dump Diagnostic for Java (MDD4J)
- Thread & Monitor Dump Analyzer for Java (TMDA)

Trace analysis:

- Trace and Request Analyzer for WAS
- Log Analyzer

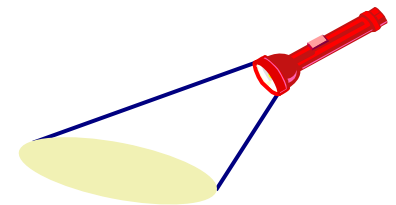
Real-time analysis: Health Center **

Configuration analysis: Visual Configuration Explorer (VCE)

*** “IBM Monitoring and Diagnostic Tools for Java™”*

Appendix

- Installing the IBM Support Assistant
- Other Diagnostic Tools for WebSphere on z/OS
- Working with Dumps & Traces
- Testing Tools & Sample Applications
- Documentation, Help & Web Resources



Diagnostic Data from WAS on z/OS

TSO/SDSF

- Browse logs
- MVS Modify cmds
- Turn tracing on
- Display WAS Servi

Other TSO/ISPF Apps

- RMF Monitors
- IPCS
- DB2 Admin

Telnet Client

- View logs
- UNIX commands
- *FTP*

Java tools

- *Jextract, . . .*

Web Browsers

- ISC - TPV
- z/OSMF Inc.Log M

ISA Tools

- **Health Center**
- **GC analyzers**
- **Dump analyzer:**
- **Log Analyzers**
- **VCE**



Workstation

3270/TSO

- SDSF/MVS console
- RMF - SMF

Telnet

- vi
- Wsadmin

Browser

- ISC (TPV)

ISA

- Analyzers
- VCE
- Health Center



How many ways can we analyze WAS on z/OS?



z/OS

Comm Server

- TN3270
- TCP/IP

- INETD

- FTP Server

WAS

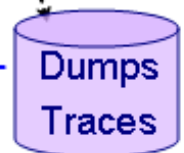
- Server
 - PMI-TPV
 - Health Center

Servant Region JVM

WAS/OEM

- zOSMF

Artifacts



tn3270

telnet

ftp

http

port 1972

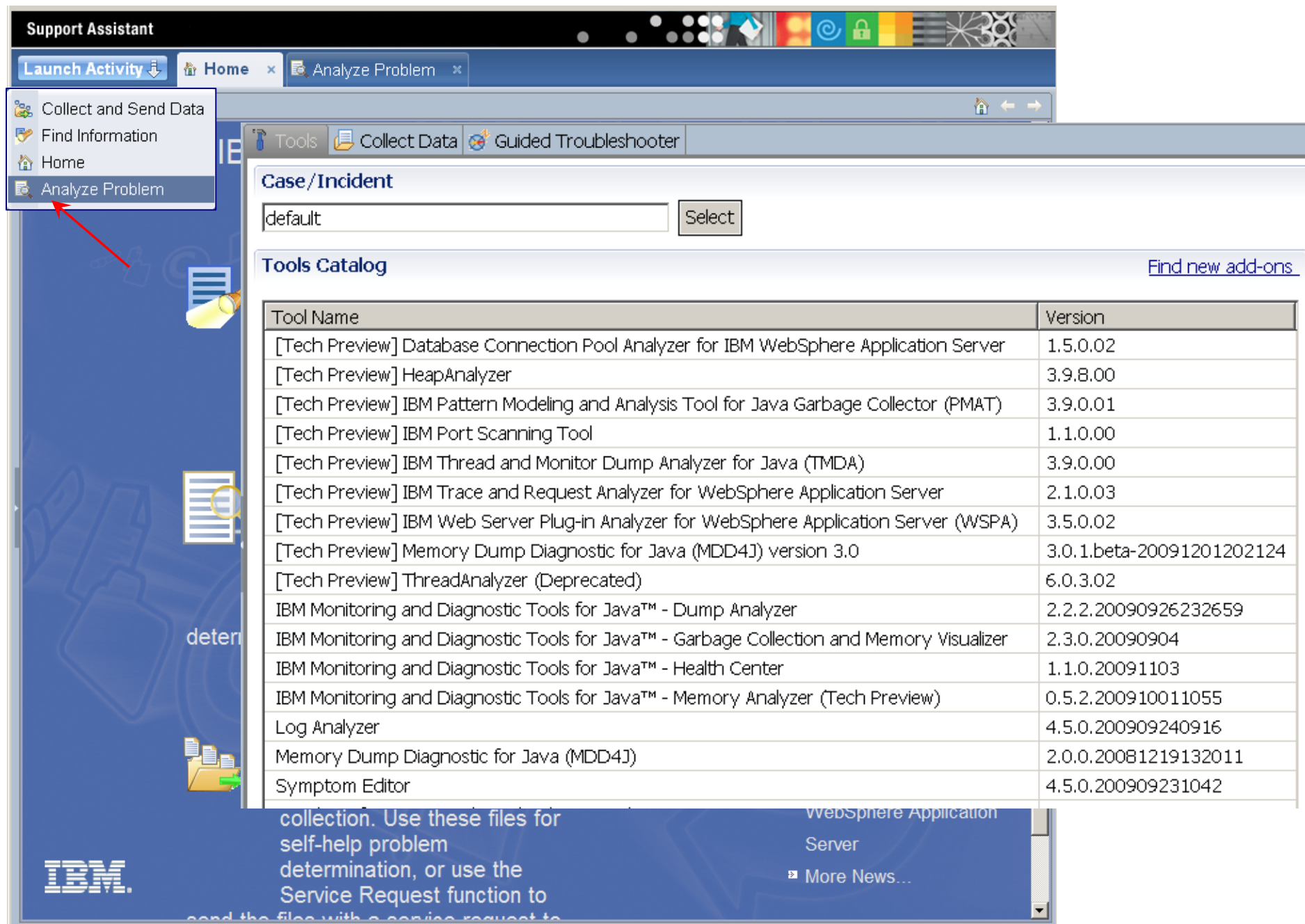
ftp

Which Tools for which Artifacts?

<i>Artifact</i>	<i>Tool</i>
GCverbose xml (SYSOUT)	GCMV PMAT
Javacore	TMDA
Heapdump	Memory Analyzer MDD4J HeapAnalyzer
System Dump (jextracted)	Memory Analyzer Dump Analyzer
Logs & Traces	TRA Log Analyzer
Real Time Running Server	Health Center
Configuration XML files	VCE

IBM Support Assistant (ISA) - Launch pad:

Use “Launch Activity” pull-down > “Analyze Problem”



Support Assistant

Launch Activity ▾ Home x Analyze Problem x

- Collect and Send Data
- Find Information
- Home
- Analyze Problem

Tools Collect Data Guided Troubleshooter

Case/Incident

default Select

Tools Catalog [Find new add-ons](#)

Tool Name	Version
[Tech Preview] Database Connection Pool Analyzer for IBM WebSphere Application Server	1.5.0.02
[Tech Preview] HeapAnalyzer	3.9.8.00
[Tech Preview] IBM Pattern Modeling and Analysis Tool for Java Garbage Collector (PMAT)	3.9.0.01
[Tech Preview] IBM Port Scanning Tool	1.1.0.00
[Tech Preview] IBM Thread and Monitor Dump Analyzer for Java (TMDA)	3.9.0.00
[Tech Preview] IBM Trace and Request Analyzer for WebSphere Application Server	2.1.0.03
[Tech Preview] IBM Web Server Plug-in Analyzer for WebSphere Application Server (WSPA)	3.5.0.02
[Tech Preview] Memory Dump Diagnostic for Java (MDD4J) version 3.0	3.0.1.beta-20091201202124
[Tech Preview] ThreadAnalyzer (Deprecated)	6.0.3.02
IBM Monitoring and Diagnostic Tools for Java™ - Dump Analyzer	2.2.2.20090926232659
IBM Monitoring and Diagnostic Tools for Java™ - Garbage Collection and Memory Visualizer	2.3.0.20090904
IBM Monitoring and Diagnostic Tools for Java™ - Health Center	1.1.0.20091103
IBM Monitoring and Diagnostic Tools for Java™ - Memory Analyzer (Tech Preview)	0.5.2.200910011055
Log Analyzer	4.5.0.200909240916
Memory Dump Diagnostic for Java (MDD4J)	2.0.0.20081219132011
Symptom Editor	4.5.0.200909231042

collection. Use these files for self-help problem determination, or use the Service Request function to send the files with a service request to

WebSphere Application Server

More News...

GC Visualization and Analysis

```
<af type="tenured" id="13" timestamp="Jul 30 17:33:20 2009" intervals="1.601">
  <minimum requested_bytes="24" />
  <time exclusiveaccessms="0.132" meanexclusiveaccessms="0.063" threads="4" lastthreadid="0x43FA
  <refs soft="249" weak="11193" phantom="2" dynamicSoftReferenceThreshold="0" maxSoftReferenceThr
  <tenured freebytes="0" totalbytes="536870400" percent="0" >
    <soa freebytes="0" totalbytes="536870400" percent="0" />
    <loa freebytes="0" totalbytes="0" percent="0" />
  </tenured>
```

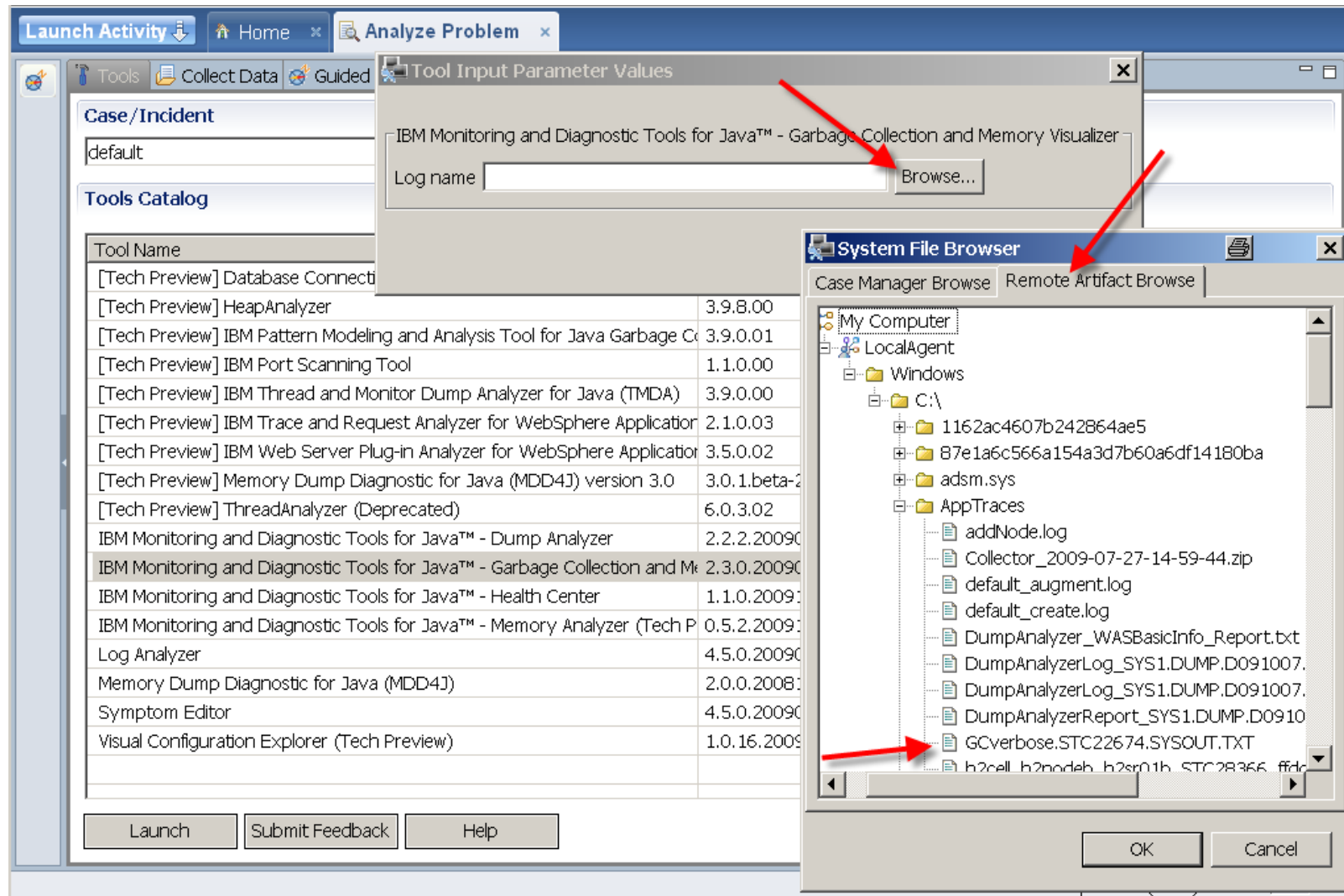
1. Enable verbose GC in your ISC:
 - AppServer -> Process defs -> Servant -> JVM, click on “Verbose garbage collection”.
 - Click “OK”, Save the changes, and re-start server.
2. Verify the verbose GC setting using SDSF
 - Look for <af> & <gc> xml structures in servant’s log.
3. Drive an application in your server.
 - Use your own, or sample apps provided.
 - Jmeter, MS Web AppStress tool or your own to drive load.
4. Copy verboseGC output from SYSOUT to ASCII file (on your workstation)
5. Launch GC verbose visualizers (GCMV or PMAT) and browse to the file you uploaded.

```
ss than 4%)" />
```

```
axSoftReferenceThr
```

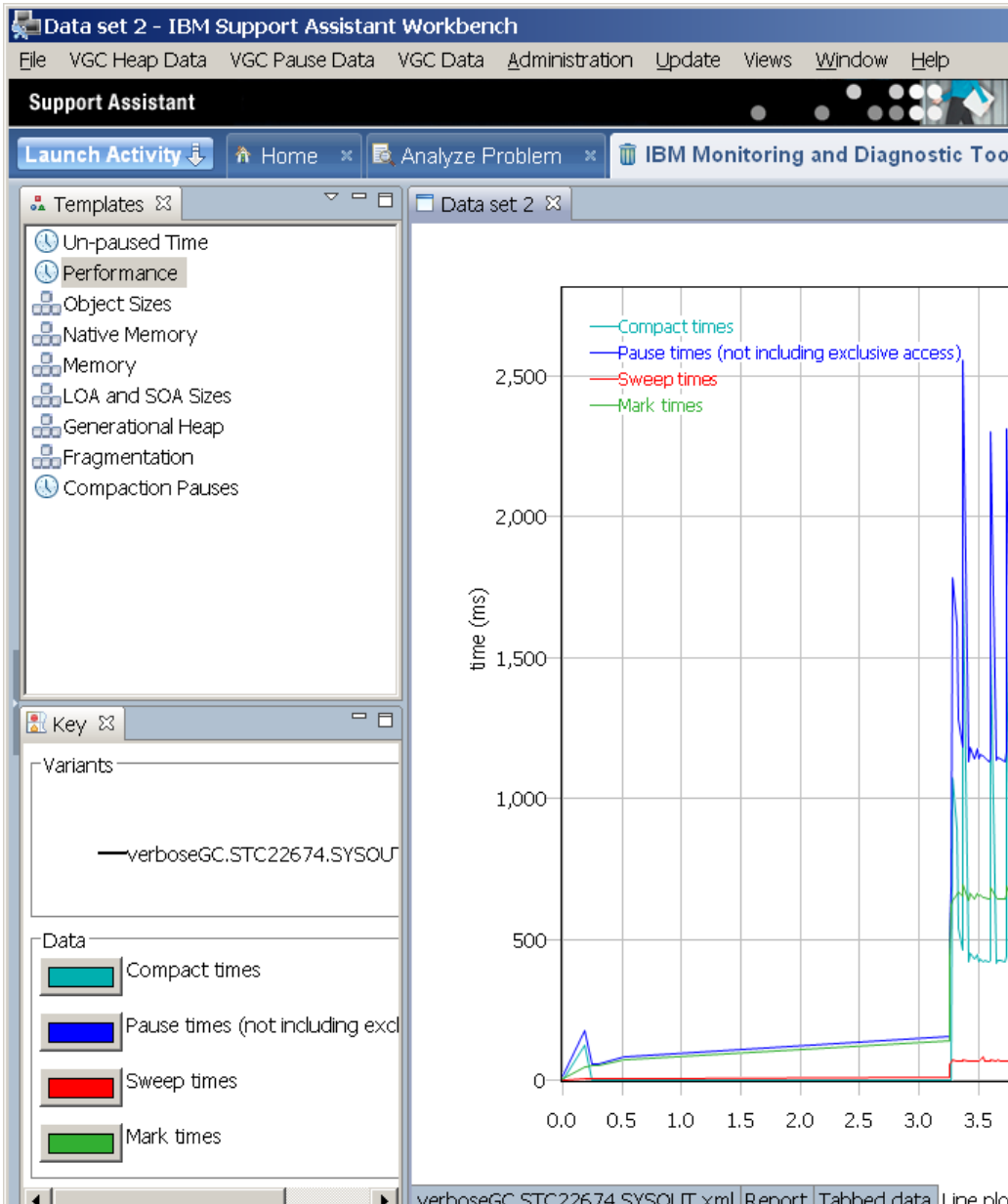
GC Visualization and Analysis tools

Launch one of the GC verbose visualizers (GCMV or PMAT) and browse to the file you uploaded.



GC and Memory Visualizer (GCMV) - *IMDTJ*

Uses verbose GC (xml doc)

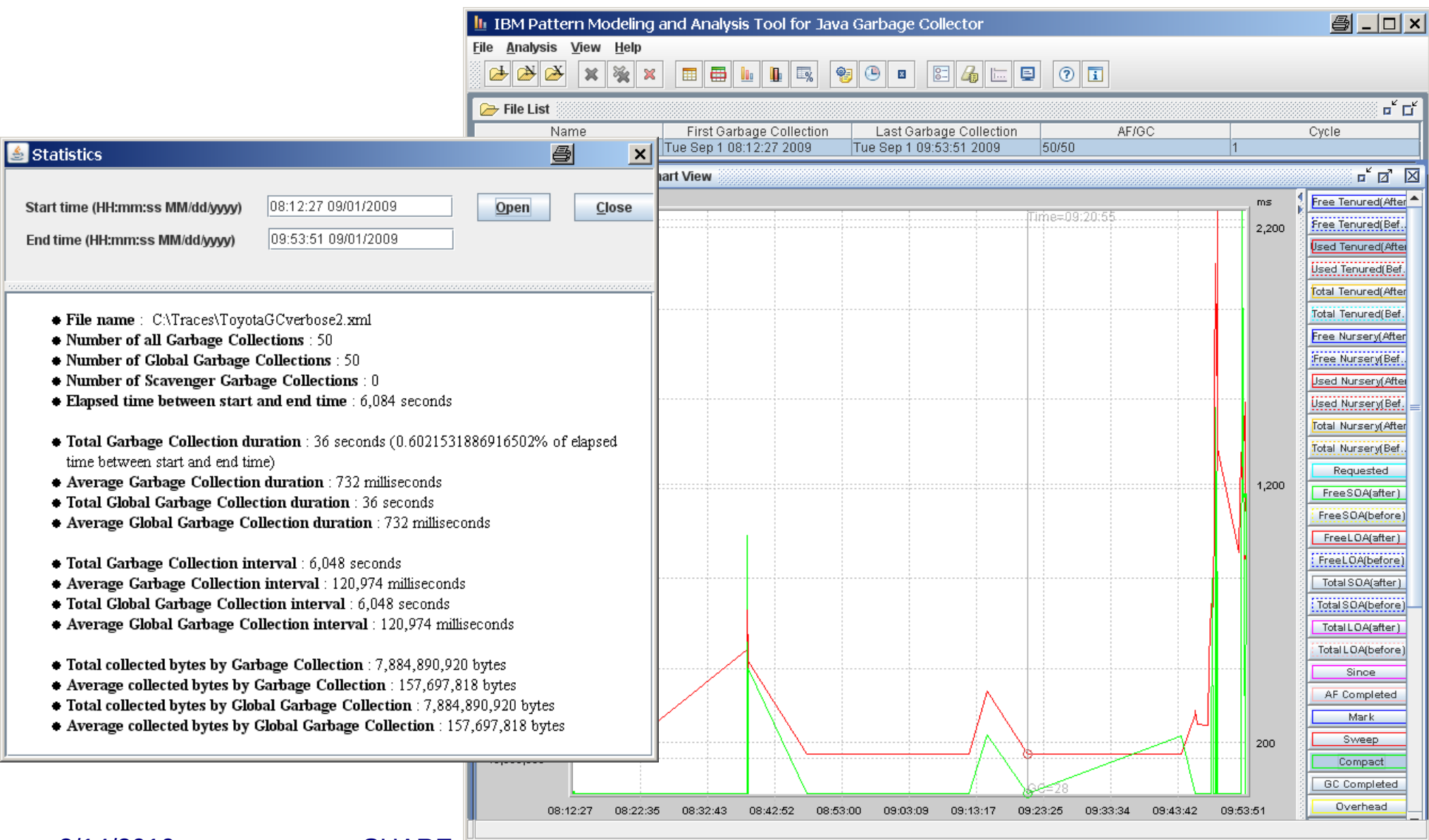


Summary

Allocation failure count	137
Forced collection count	3
GC Mode	optthruput
Largest memory request (bytes)	19496
Mean garbage collection pause (ms)	1514
Mean heap unusable due to fragmentation (MB)	0.0
Mean interval between collections (minutes)	0.04
Number of collections	209
Proportion of time spent in garbage collection pauses (%)	57.9
Proportion of time spent unpaused (%)	42.1
Rate of garbage collection (MB/minutes)	126

Pattern Modeling & Analysis Tool for Java GC (PMAT)

Different perspective than GCMV - PMAT does not run in the ISA workspace. When you click Next, a separate display appears.



JVM Dumps - Many kinds . . .

- **Java Dumps** > /var/home/...
 - Heap
 - JavaCore
 - JVM TDUMP:
- SVC Dumps, ABEND Dumps, SYSABENDs
- CEE Dumps

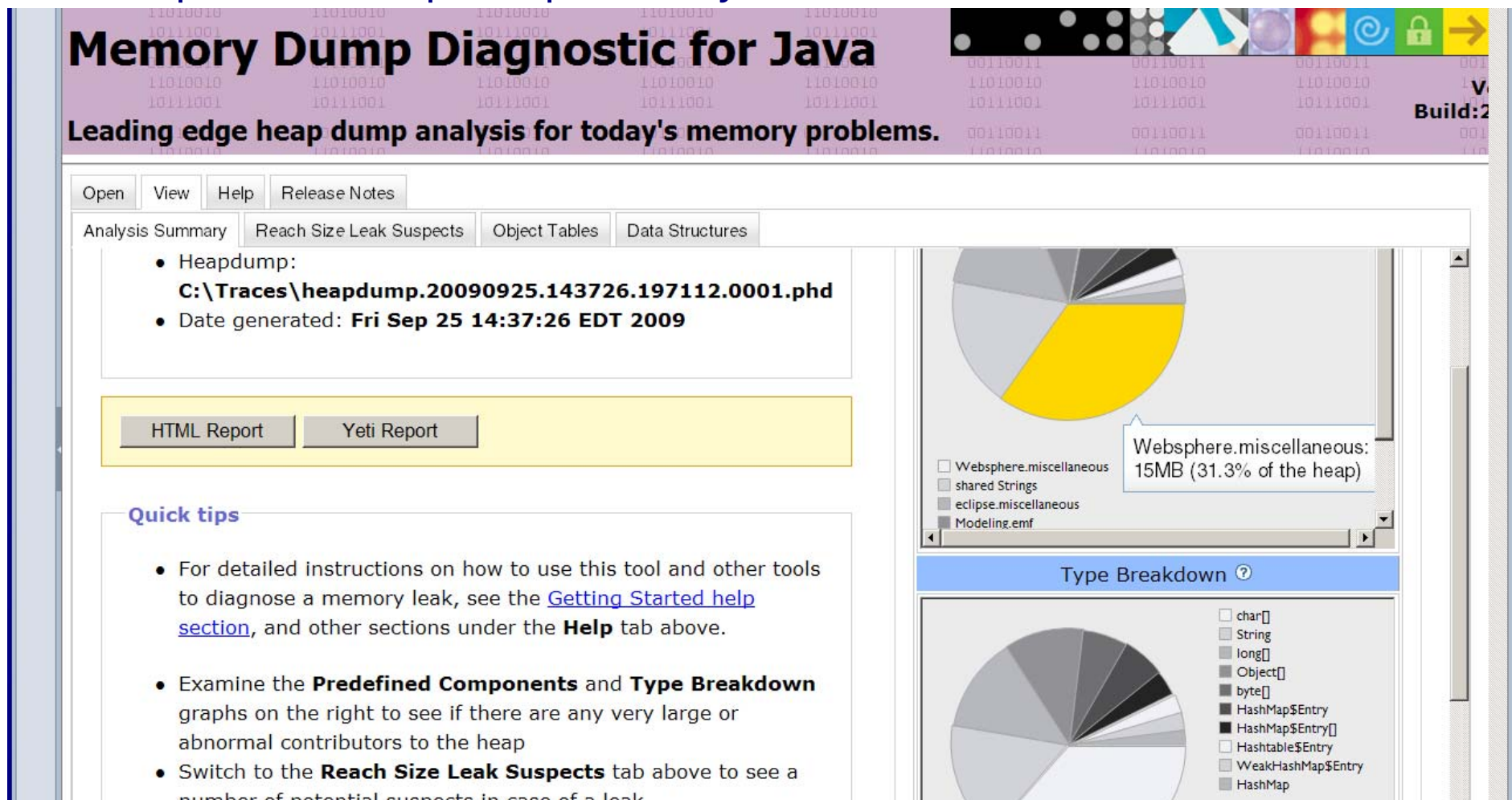
Analysis Tools:

- MDD4J – high level – good for “Leak Suspects”
- Memory Analyzer – More detailed
- Dump Analyzer
- Heap Analyzer
- Thread & Monitor Dump Analyzer for Java (TMDA)

See “Analyzing Dumps” in appendix for more details.

Memory Dump Diagnostic for Java - V3 (MDD4J)

- Focus on data structures that may cause memory related problems.
- Analyze heap dumps:
 - “Baseline” heap dump – take when application is started.
 - “Primary” heap dump – when a problem occurs.
 - “Comparative” heap dumps – analyze differences.



Memory Dump Diagnostic for Java
 Leading edge heap dump analysis for today's memory problems.

Build: 2.0.0

Open View Help Release Notes

Analysis Summary Reach Size Leak Suspects Object Tables Data Structures

- Heapdump:
 C:\Traces\heapdump.20090925.143726.197112.0001.phd
- Date generated: **Fri Sep 25 14:37:26 EDT 2009**

HTML Report Yeti Report

Quick tips

- For detailed instructions on how to use this tool and other tools to diagnose a memory leak, see the [Getting Started help section](#), and other sections under the **Help** tab above.
- Examine the **Predefined Components** and **Type Breakdown** graphs on the right to see if there are any very large or abnormal contributors to the heap
- Switch to the **Reach Size Leak Suspects** tab above to see a number of potential suspects in case of a leak

Type Breakdown

WebSphere.miscellaneous: 15MB (31.3% of the heap)

Legend:

- WebSphere.miscellaneous
- shared Strings
- eclipse.miscellaneous
- Modeling.emf
- char[]
- String
- long[]
- Object[]
- byte[]
- HashMap\$Entry
- HashMap\$Entry[]
- Hashtable\$Entry
- WeakHashMap\$Entry
- HashMap

MDD4J analysis (cont'd)

- **Guided Activity Assistant**
 - “Summary” – Basic Heap Info & Contents Summary.
 - “Reach Size Leak Objects” – Cumulative size of all objects.
 - “Object/Class” leak suspects.
 - “Data Structures view” – Understand relations & Track Changes.
 - Big/Growing/Shrinking/Steady
- **Yeti Reports:** (HTML or Yeti zip file)
 - Save as HTML file, or Yeti analysis zip file – extract & open `index.html` file.
 - Analysis engine based on "Yeti" technology.
 - Overview
 - Health Report
 - Content Graphs – Type & Field layout views
- **Additional documentation:**
 - Techdoc WP101612 – “Getting started with GC, Heapdumps and Javacores for WebSphere on z/OS”
 - DeveloperWorks Summary doc:
www.ibm.com/developerworks/websphere/techjournal/0909_supauth/0909_supauth.html

Yeti Reports (from MDD4J)

Extract zip file created by MDD4J, & launch index.html

Data Structures: Big Growing Shrinking Steady

ServletWrapperImpl	472MB
HTODDynamache	4.67MB
JmxMBeanServer et al.	3.41MB
SystemState et al.	3.18MB
ResourceBundle class o...	2.66MB

Overview **Health Report**

Summary of all live objects in the heap.

There are 512MB of live objects, of which 80MB is overhead.

Predefined Components



- WebSphere.miscellaneous
- shared Strings
- eclipse.miscellaneous
- jmx
- Modeling.emf
- IBM.miscellaneous
- WebSphere.security

Type Breakdown



- by
- Li
- M
- ch
- lo
- St
- O

Analysis Summary Report

Open/Close all major sections Open all sections

Primary heap file info:

+ C:\AppTraces\heapdump.20091013.140817.196909.0

+ Heap Contents Summary ?

+ Aggregated Data Structure Leak Suspects ?

+ Object/Class Leak Suspects ?

+ Big Data Structures ?

+ Whole Heap Health Measures ?

MDD4J: Content Schematic of ServletWrapperImpl

This schematic explains 472MB.

```

graph TD
    A[ServletWrapperImpl  
20MB] -- 872,116 --> B[MemWorkout$Blob  
452MB]
    
```

Description	Size	Reachable Size	Shared Size
+ com.ibm.ws.security.web.WebAppCache class object	446kB	230MB	229MB
+ com.ibm.ws.webcontainer.servlet.ServletWrapperImpl	207MB	207MB	0 bytes
+ com.ibm.ws.cache.HTODDynamache	8.16MB	8.16MB	0 bytes
+ com.ibm.ws.management.descriptor.MBeanDescriptorManager	191kB	5.36MB	5.17MB
+ org.eclipse.emf.ecore.impl.EPackageRegistryImpl class object	16kB	3.69MB	3.67MB
+ org.eclipse.emf.ecore.impl.EPackageRegistryImpl	1.47MB	3.02MB	1.55MB
+ com.ibm.ws.naming.ipbase.NameSpace	183kB	2.23MB	2.05MB
+ com.ibm.ws.naming.ipbase.NameSpace	47kB	2.11MB	2.07MB
+ com.ibm.ws390.orb.CommonBridge class object	360 bytes	1.75MB	1.75MB
+ javax.management.modelmbean.ModelMBeanOperationInfo	1.6MB	1.65MB	52kB

Memory Analyzer (IMDTJ)

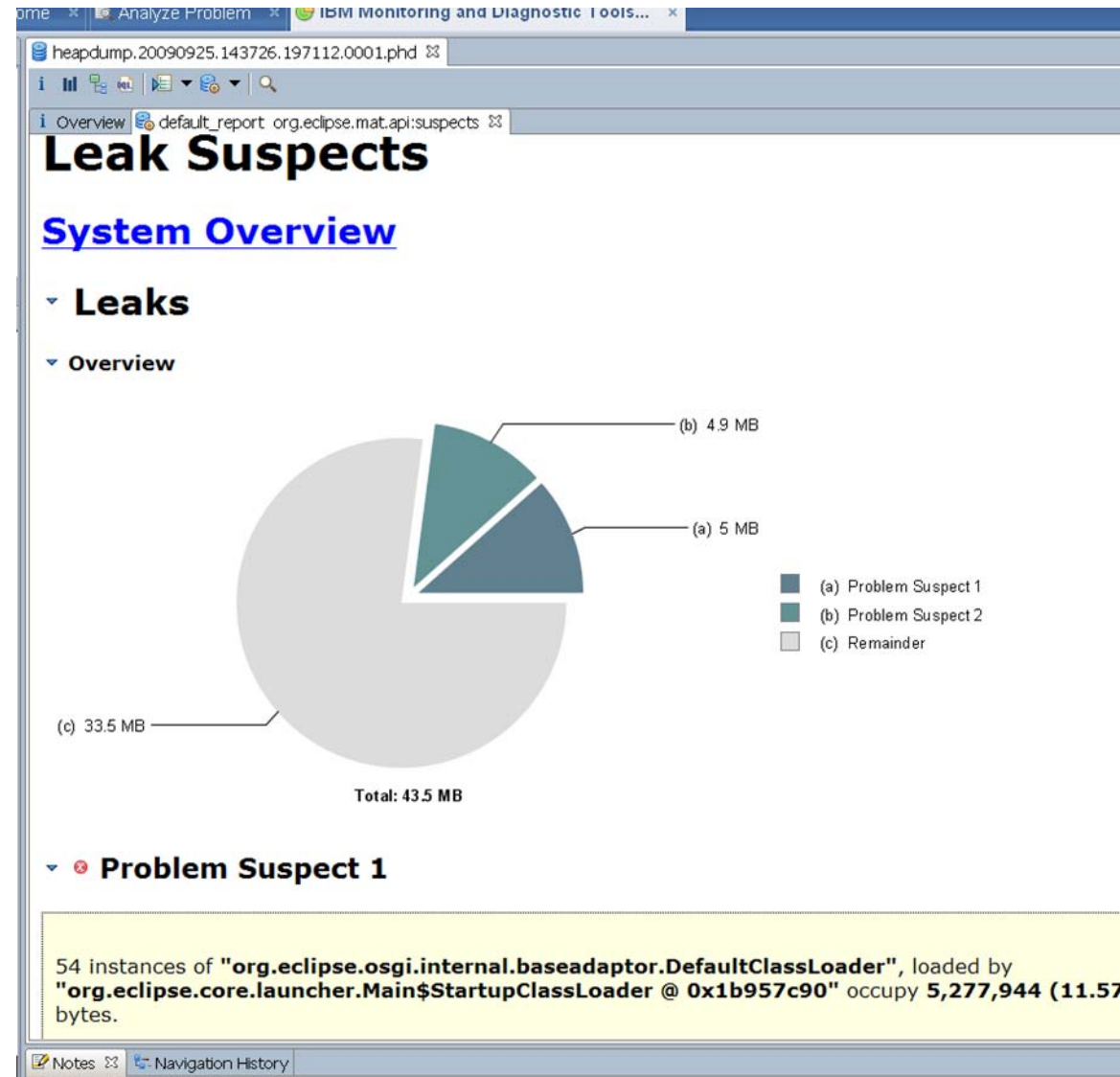
- Based on open source M.A.T. + DTFJ - www.eclipse.org/mat
- For java heapdumps, System Dumps (jextracted) & javacore*

Getting Started wizard:

- Overview ----->
- Leak report
- Component reports

Navigate: (TOC, Fly-over, Click)

- Histogram (tables)
- Context (In, Out Refs)
- Group (Pkg, Class, Loader)
- Dominator Tree
 - Objects keeping others
- Path to GC roots
- Leak reports



Memory Analyzer samples

Navigate: (TOC, Fly-over, Click)

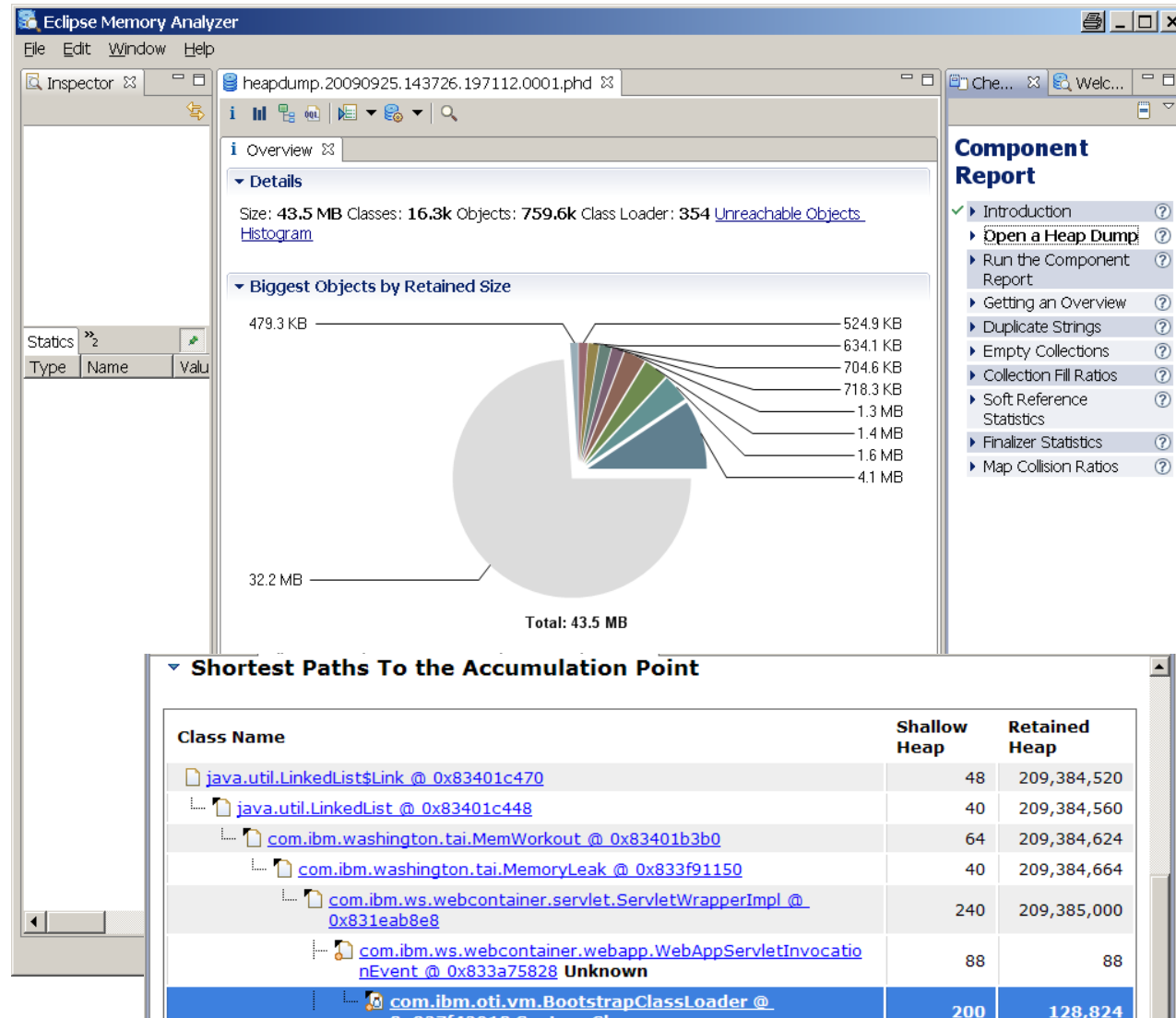
- **Histogram (tables)**
- **Context (In, Out Refs)**
- **Group (Pkg, Class, Loader)**
- **Dominator Tree**
 - Objects keeping others
- **Path to GC roots**
- **Leak reports**

Example: Biggest objects by Retained Size:

Overview | default_report | org.eclipse.mat.api:suspects

Table Of Contents

- System Overview
 - Heap Dump Overview
 - System Properties
 - Thread Overview
 - Top Consumers
 - Biggest Objects (Overview)
 - Biggest Objects
 - Biggest Top-Level Dominator Classes (Overview)
 - Biggest Top-Level Dominator Classes
 - Biggest Top-Level Dominator Class Loaders (Overview)
 - Biggest Top-Level Dominator Class Loaders
 - Biggest Top-Level Dominator Packages
 - Class Histogram
- Leaks
 - Overview
 - Problem Suspect 1
 - Description



Memory Analyzer sample use case

- File>Open Heap Dump > Leak Suspects Report > Problem Suspect1 > “Shortest Paths To the Accumulation Point” and “Accumulated Objects”
- There we found the suspect “MemoryLeak.”

ump.20091013.140817.196909.0011.phd x

view default_report org.eclipse.mat.api:suspects

- System Overview
 - Heap Dump Overview
 - System Properties
 - Thread Overview
 - Top Consumers
 - Biggest Objects (Overview)
 - Biggest Objects
 - Biggest Top-Level Dominator Classes (Overview)
 - Biggest Top-Level Dominator Classes
 - Biggest Top-Level Dominator Class Loaders (Overview)
 - Biggest Top-Level Dominator Class Loaders
 - Biggest Top-Level Dominator Packages
 - Class Histogram
- Leaks
 - Overview
 - Problem Suspect 1
 - Description
 - Shortest Paths To the Accumulation Point
 - Accumulated Objects
 - Accumulated Objects by Class

Table Of Contents Created by Memory

Overview default_report org.eclipse.mat.api:top_components default_report org.eclipse.mat.api:suspects

Shortest Paths To the Accumulation Point

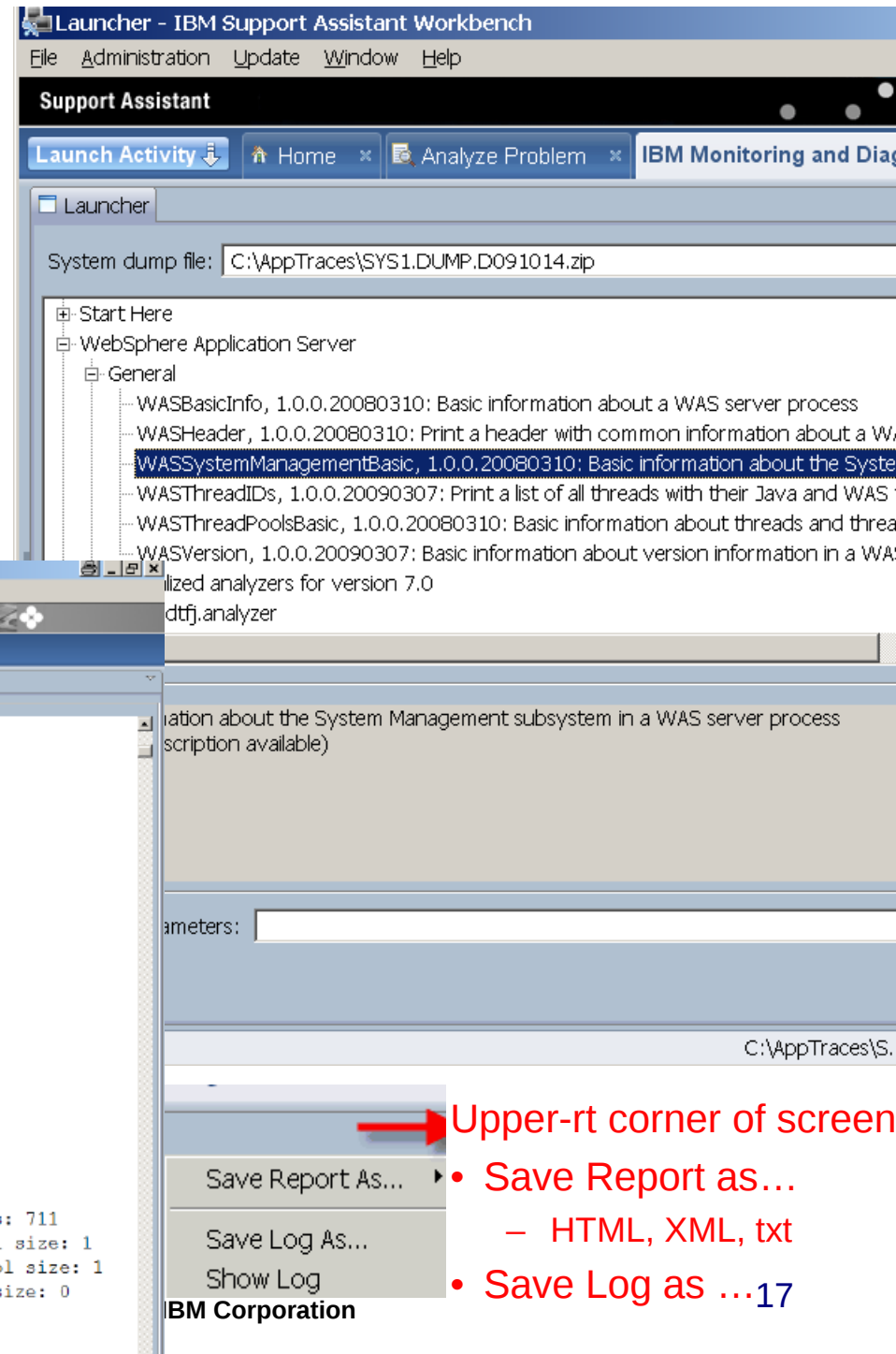
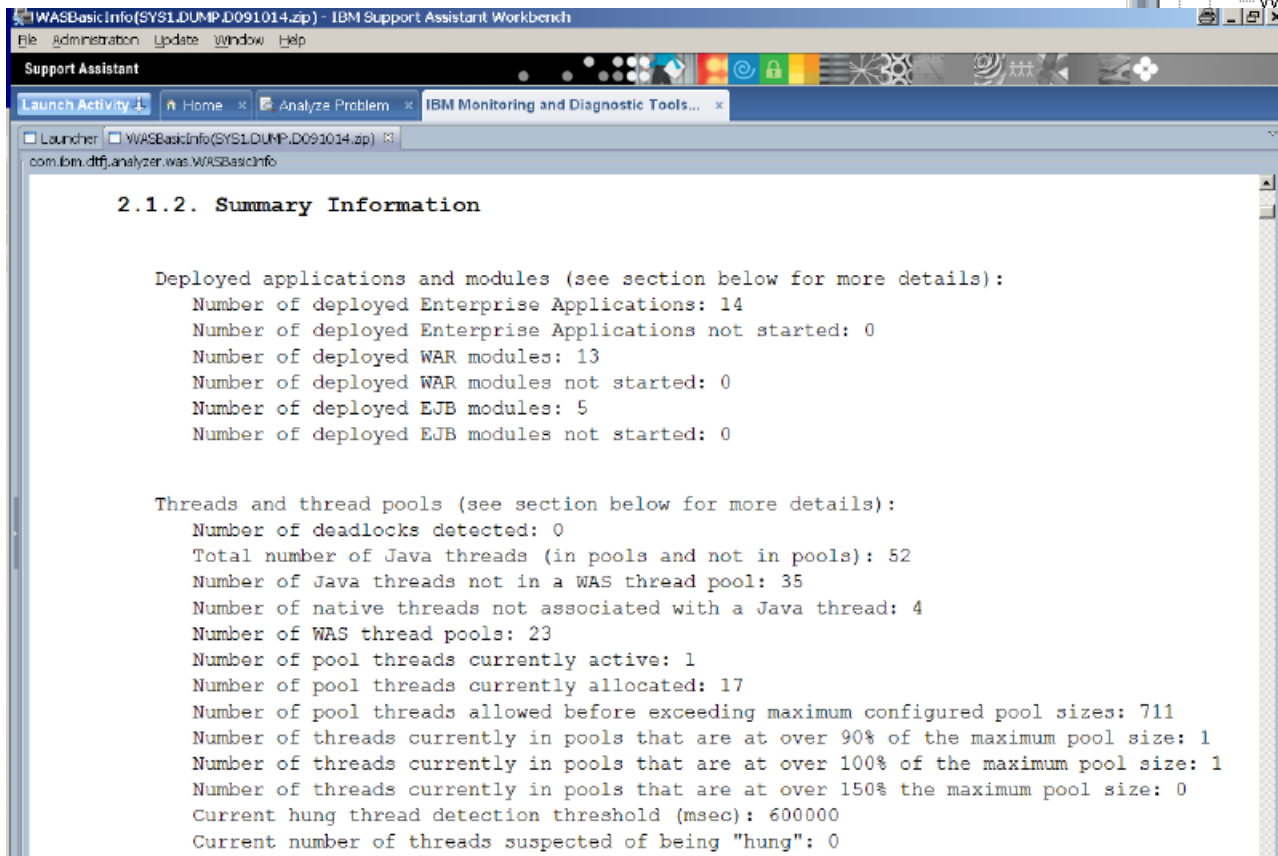
Class Name	Shallow Heap	Retained Heap
java.util.LinkedList\$Link @ 0x83401c470	48	209,384,520
java.util.LinkedList @ 0x83401c448	40	209,384,560
com.ibm.washington.tai.MemWorkout @ 0x83401b3b0	64	209,384,624
com.ibm.washington.tai.MemoryLeak @ 0x833f91150	40	209,384,664
com.ibm.ws.webcontainer.servlet.ServletWrapperImpl @ 0x831eab8e8	240	209,385,000
com.ibm.ws.webcontainer.webapp.WebAppServletInvocationEvent @ 0x833a75828 Unknown	88	88
com.ibm.oti.vm.BootstrapClassLoader @ 0x827f42910 System Class	200	128,824
java.util.LinkedList\$Link @ 0x833a6d880 »	48	48
com.ibm.ws.util.ClauseNode @ 0x831ec8590 »	56	432
Σ Total: 3 entries		

Accumulated Objects

Class Name	Shallow Heap	Retained Heap	Percentage
com.ibm.ws.webcontainer.servlet.ServletWrapperImpl @ 0x831eab8e8	240	209,385,000	77.79%
com.ibm.washington.tai.MemoryLeak @ 0x833f91150	40	209,384,664	77.79%
com.ibm.washington.tai.MemWorkout @ 0x83401b3b0	64	209,384,624	77.79%
java.util.LinkedList @ 0x83401c448	40	209,384,560	77.79%

Dump Analyzer - *IMDTJ*

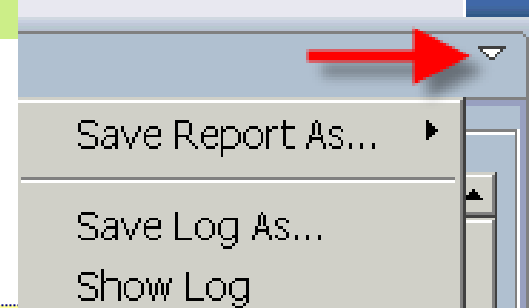
- Based on JVM's **jdumpview** tool
- System dumps processed by jextract
- FTP to workstation (binary)
- Import dump – “Browse”
- Select report, “Analyze”
 - Click on WASBasicInfo . . . or . . .



Dump Analyzer – Analysis Reports

- Save Report As: html, xml, or txt files

- Default Dump Report:



2. Analysis results

DumpAnalyzer V:2.2.2.20090926232659 : Start analysis of C:\AppTraces\SYS1.DUMP.D091014.zip

2.1. Results from Analyzer=com.ibm.dtfj.analyzer.jvm.DefaultDumpReport_Standard

Analyzer full name: com.ibm.dtfj.analyzer.jvm.DefaultDumpReport_Standard

Analyzer version: 1.3.0.20070812

Analyzer description: Report basic information from this JVM image (similar to javacore) - Standard version

2.1.1. Image and runtime information

Now reporting on runtime: 0.0.0

Image: (no identity)

Time of dump: Wed Oct 14 02:28:14 EDT 2009

System Type: z/OS

System SubType: 01.10.00

Processor Type: s390x

Processor SubType:

Number of Processors: 2

Installed Memory: 6442450944

Host Name: wsc2

IP address: /9.82.24.70

This Image contains: 1 address spaces; 1 processes; 1 runtimes

Process: PID:0x30208

Executable: main

Command line: [<null>]

Pointer size (bits): 64

Signal that triggered this dump: 0 ((no signal info available, or dump was not triggered by a signal))

Current Thread: 0x14b06000

Java Runtime: JavaVM@0x000000080B178548

Java Version: Java(TM) SE Runtime Environment(build pmz6460sr5ifx-20090623_02 (SR5)) IBM J9

2.1.2. JVM Initialization Arguments

JNI ignoreUnrecognized: False

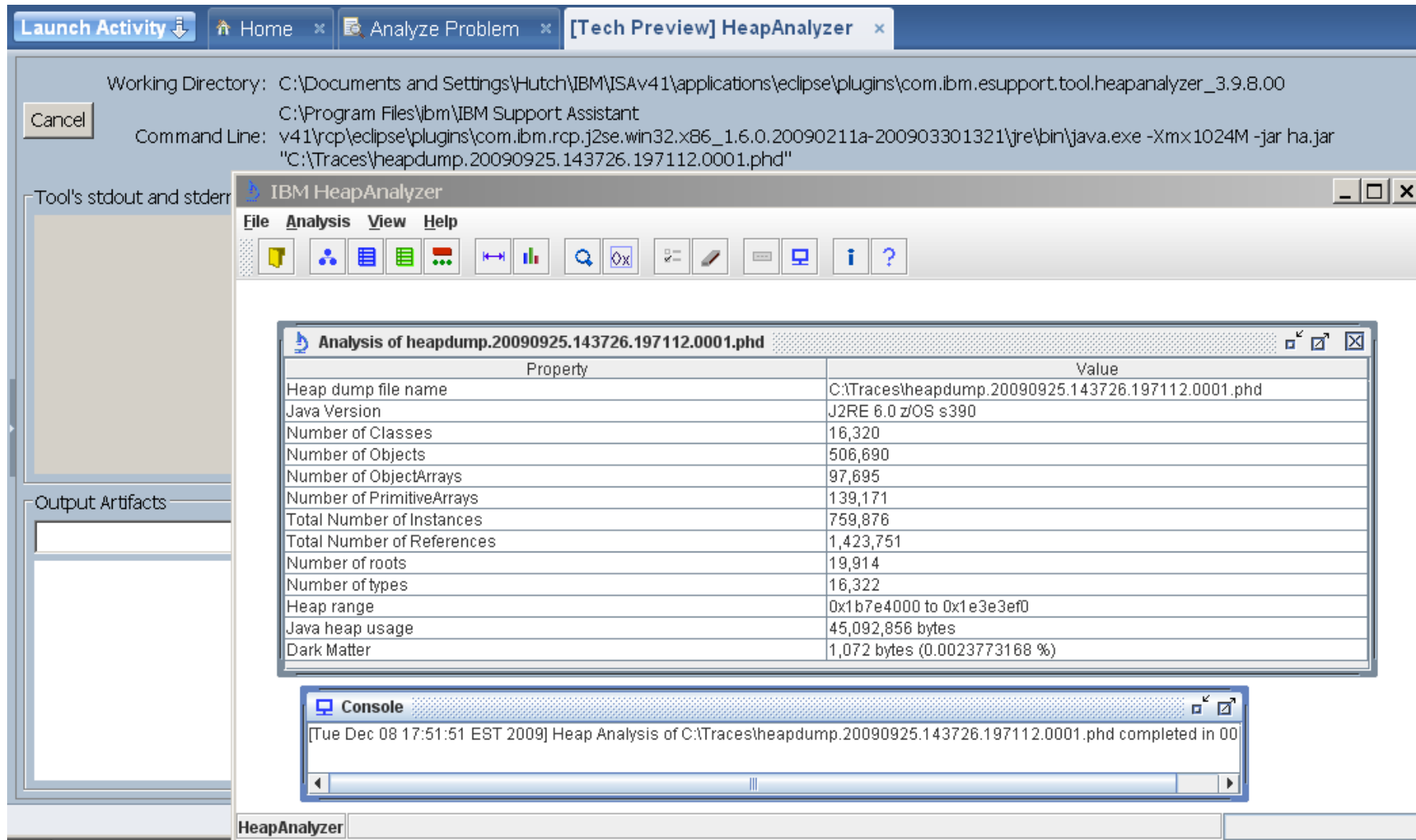
JNI version: 65540

-Xthr:tw=HEAVY

ExtraInfo=0x00000000

HeapAnalyzer (New on ISA!)

- Originally provided on AlphaWorks
- Graphical analysis of javacores (heapdumps)
- Creates tables & graphs
- Heuristic engine to find memory leaks and excessive heap usage.



Working Directory: C:\Documents and Settings\Hutch\IBM\ISA\v41\applications\eclipse\plugins\com.ibm.esupport.tool.heapanalyzer_3.9.8.00

Command Line: v41\rcp\eclipse\plugins\com.ibm.rcp.j2se.win32.x86_1.6.0.20090211a-200903301321\jre\bin\java.exe -Xmx1024M -jar ha.jar "C:\Traces\heapdump.20090925.143726.197112.0001.phd"

IBM HeapAnalyzer

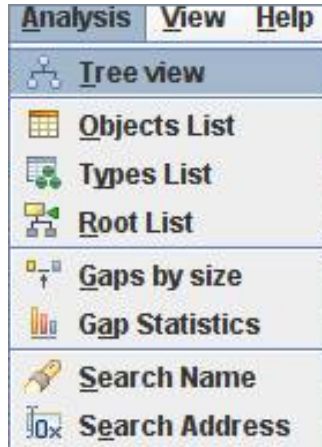
File Analysis View Help

Property	Value
Heap dump file name	C:\Traces\heapdump.20090925.143726.197112.0001.phd
Java Version	J2RE 6.0 z/OS s390
Number of Classes	16,320
Number of Objects	506,890
Number of ObjectArrays	97,695
Number of PrimitiveArrays	139,171
Total Number of Instances	759,876
Total Number of References	1,423,751
Number of roots	19,914
Number of types	16,322
Heap range	0x1b7e4000 to 0x1e3e3ef0
Java heap usage	45,092,856 bytes
Dark Matter	1,072 bytes (0.0023773168 %)

Console

[Tue Dec 08 17:51:51 EST 2009] Heap Analysis of C:\Traces\heapdump.20090925.143726.197112.0001.phd completed in 00

HeapAnalyzer (cont'd)



Analysis Views:

- Tree view
- Objects List
- Types List
- Root List
- Gaps by size

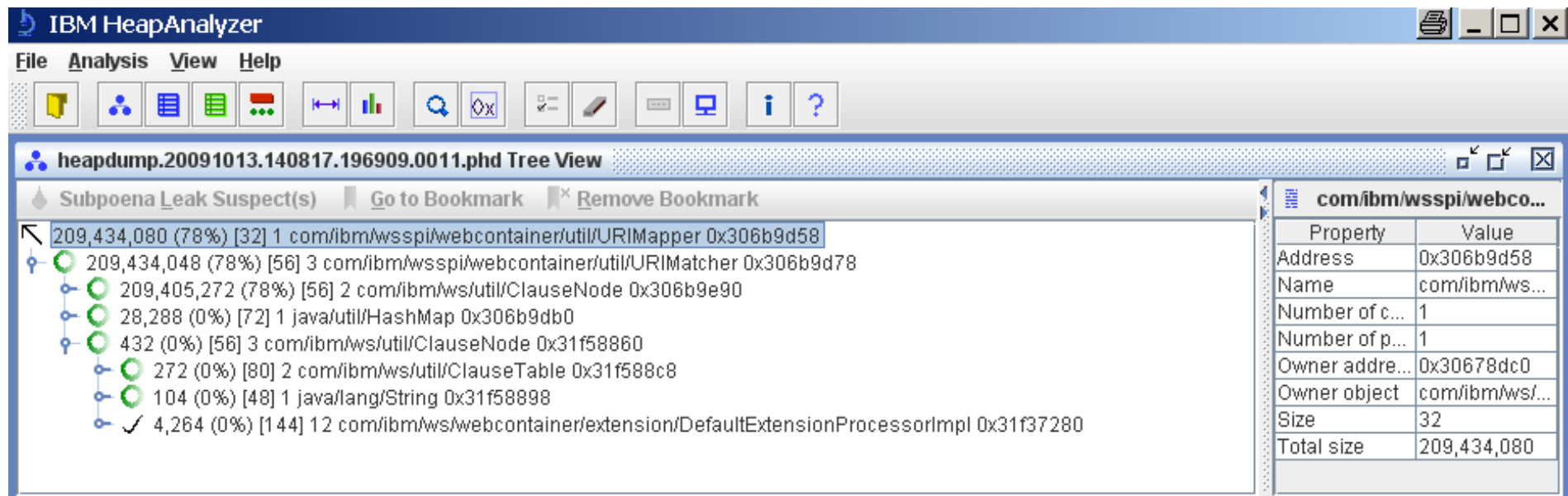
Locate a leak suspect



Located a leak suspect

java/util/LinkedList\$Link (count : 340,599)
is responsible for 209,383,848 bytes

OK



See detailed information of a node; search for total size drop between parent and child.

- Tree node format: **TotalSize(Size/Heap%)[ObjSize] #ChildObj (# root obj) Name Addr**
- Select a node and right click to find an address.

Thread & Monitor Dump Analyzer for Java (TMDA)

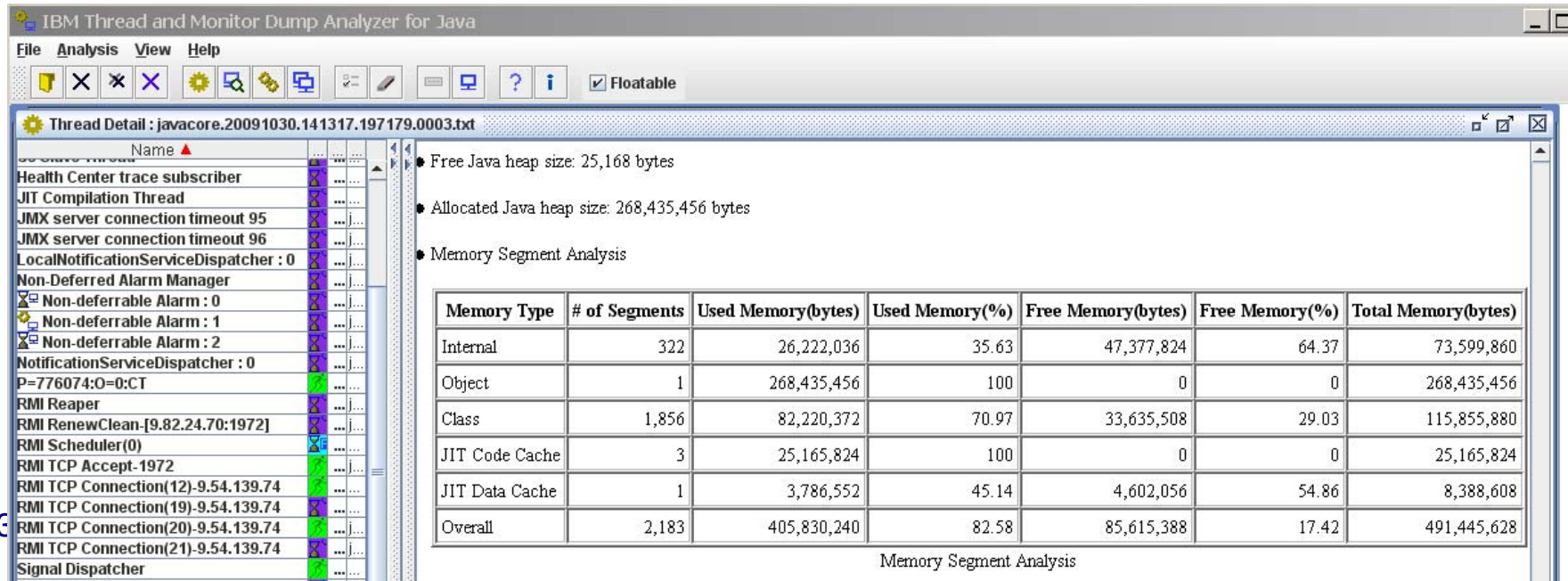
TMDA for Java analyzes javacore dumps and helps you find hangs, deadlocks, resource contention, and bottlenecks in Java threads. (Tech preview.)

Webcast & Foils: ibm.com/support/docview.wss?uid=swg27011855

Features provided & Color coding:

- Summary of Javacore
- Thread detail view
- Monitor detail view
- List of hang suspects
- Thread compare view
- Thread comparison summary
- Monitor lock compare view
- Garbage collector statistics for IBM JVM

Status	Number of Threads : 59	Percentage
 Deadlock	0	0 (%)
 Runnable	16	27 (%)
 Waiting on condition	39	66 (%)
 Waiting on monitor	0	0 (%)
 Suspended	0	0 (%)
 Object.wait()	0	0 (%)
 Blocked	3	5 (%)
 Parked	1	2 (%)



The screenshot shows the IBM Thread and Monitor Dump Analyzer for Java (TMDA) interface. The main window displays a list of threads on the left, including 'Health Center trace subscriber', 'JIT Compilation Thread', 'JMX server connection timeout 95', 'JMX server connection timeout 96', 'LocalNotificationServiceDispatcher : 0', 'Non-Deferred Alarm Manager', 'Non-deferrable Alarm : 0', 'Non-deferrable Alarm : 1', 'Non-deferrable Alarm : 2', 'NotificationServiceDispatcher : 0', 'P=776074:0=0:CT', 'RMI Reaper', 'RMI RenewClean-[9.82.24.70:1972]', 'RMI Scheduler(0)', 'RMI TCP Accept-1972', 'RMI TCP Connection(12)-9.54.139.74', 'RMI TCP Connection(19)-9.54.139.74', 'RMI TCP Connection(20)-9.54.139.74', 'RMI TCP Connection(21)-9.54.139.74', and 'Signal Dispatcher'. The right pane shows a summary of the Java heap and memory segment analysis.

Free Java heap size: 25,168 bytes
Allocated Java heap size: 268,435,456 bytes
Memory Segment Analysis

Memory Type	# of Segments	Used Memory(bytes)	Used Memory(%)	Free Memory(bytes)	Free Memory(%)	Total Memory(bytes)
Internal	322	26,222,036	35.63	47,377,824	64.37	73,599,860
Object	1	268,435,456	100	0	0	268,435,456
Class	1,856	82,220,372	70.97	33,635,508	29.03	115,855,880
JIT Code Cache	3	25,165,824	100	0	0	25,165,824
JIT Data Cache	1	3,786,552	45.14	4,602,056	54.86	8,388,608
Overall	2,183	405,830,240	82.58	85,615,388	17.42	491,445,628

Memory Segment Analysis

Working with Traces from WAS on z/OS

- **STDOUT & STDERR** traces usually go to JES logs
 - Keep them off SYSLOG by specifying separate DD files
 - May be re-directed to HFS files – TD103695
 - Not suited for ISA trace analysis tools
- **java tracing** - enable dynamically:
 - Modify (F) MVS commands:
 - F server,tracejava='com.ibm.*=all'
 - F server,tracedetail=(3,4)
 - F server, TRACEINIT
- **ffdc** logs – automatically generated
- **wsadmin.sh** tracing – modify **wsadmin.properties** file
- **JDBC** tracing – **db2.jcc.override.traceFile=** in **DB2JccConfiguration.properties** file

TRA - Trace and Request Analyzer for WAS

- Here's a Gap Analysis for the addNode.log:
(Works with trace files from wsadmin logs.)

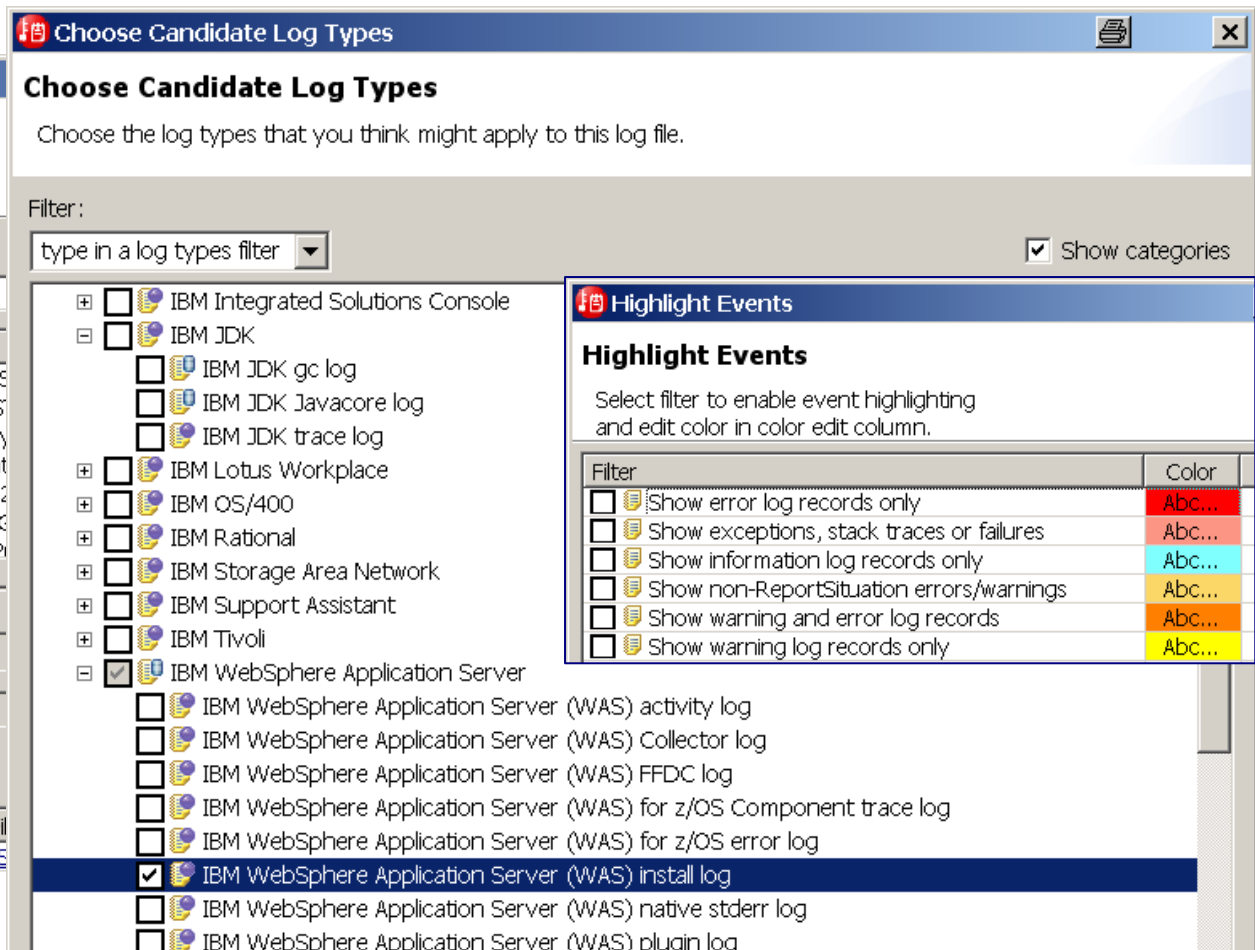
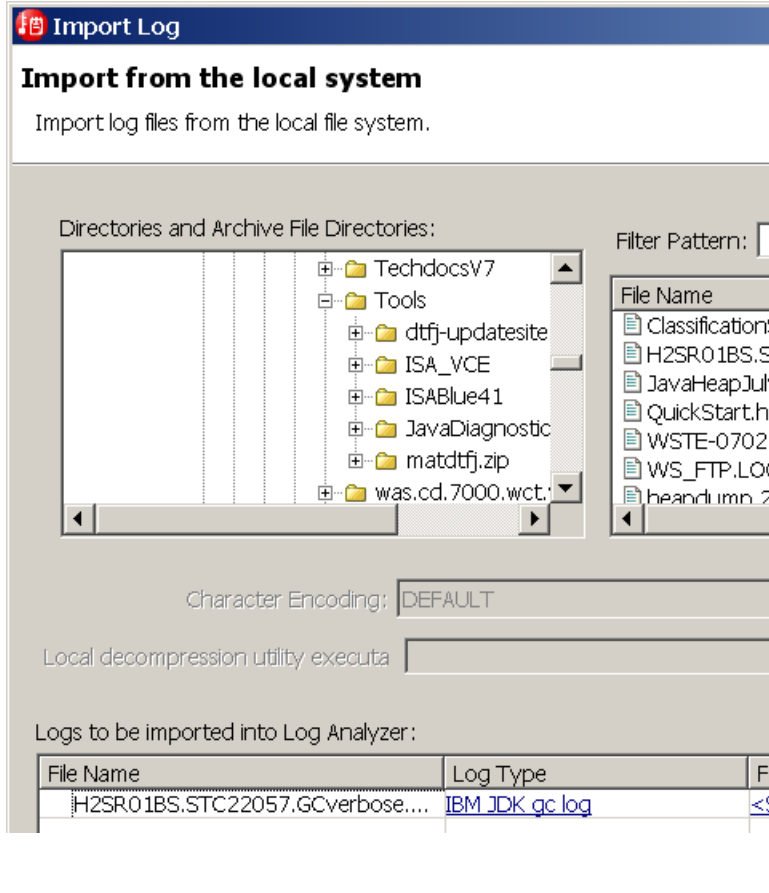
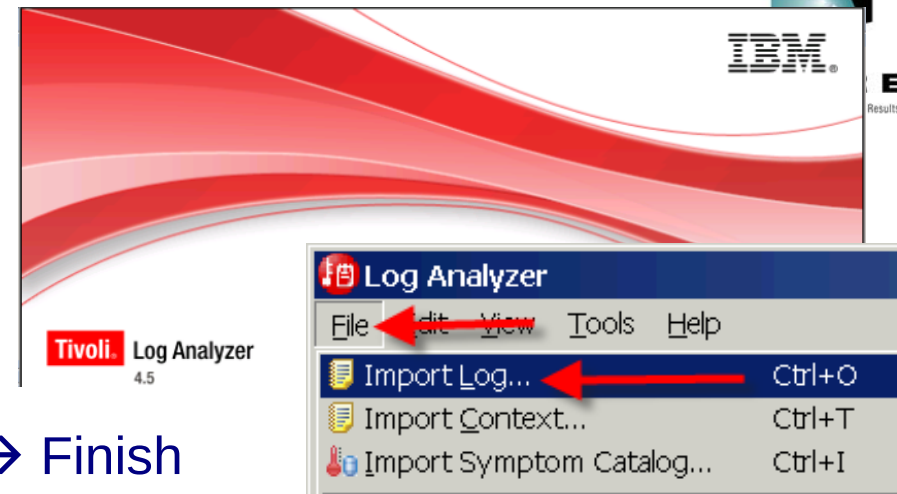
IBM Trace and Request Analyzer for WebSphere Application Server						
File Analysis Customized Analysis View Help						
Trace Gap Analysis						
Time(...)	Trace				Line Num...	Fi...
72,494	[9/8/08 15:12:38:376 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0022I: Node Agent launched. Waiting for initialization status.	107	a...
	[9/8/08 15:13:50:870 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0030I: Node Agent initialization completed successfully. Process id is: 000002ac00000002	108	a...
55,457	[9/8/08 15:11:12:337 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0120I: isclite on BLA will not be uploaded since it already exists in the target repository.	38	a...
	[9/8/08 15:12:07:794 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0016I: Synchronizing configuration between node and cell.	39	a...
29,879	[9/8/08 15:12:07:794 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0016I: Synchronizing configuration between node and cell.	39	a...
	[9/8/08 15:12:37:673 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0018I: Launching Node Agent process for node: h2nodeb	105	a...
29,249	[9/8/08 15:10:34:944 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0009I: Successfully connected to Deployment Manager Server: wsc2.washington.ibm.com:24010	21	a...
	[9/8/08 15:11:04:193 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0505I: Servers found in configuration:	22	a...
6,967	[9/8/08 15:12:27:595 EDT]	00000001 FileRepositor	A	BBOO0222I: ADMR0011I: Document cells/h2cell/PolicySets/WAS-I RSP/policySet.xml is deleted.	102	a...
	[9/8/08 15:12:34:562 EDT]	00000001 NodeSyncTask	I	com.ibm.ws.management.sync.NodeSyncTask doSync ADMS0003I: The configuration synchronization completed su...	103	a...
4,920	[9/8/08 15:10:25:076 EDT]	00000000 ModelMgr	I	BBOO0222I: WSVR0801I: Initializing all server configuration models	18	a...
	[9/8/08 15:10:29:996 EDT]	00000000 SSLConfigMana	I	BBOO0222I: CWPKI0027I: Disabling default hostname verification for HTTPS URL connections.	19	a...
4,503	[9/8/08 15:10:29:996 EDT]	00000000 SSLConfigMana	I	BBOO0222I: CWPKI0027I: Disabling default hostname verification for HTTPS URL connections.	19	a...
	[9/8/08 15:10:34:499 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0001I: Begin federation of node h2nodeb with Deployment Manager at wsc2.washington.ibm.com:...	20	a...
3,266	[9/8/08 15:11:05:883 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0015I: Backing up the original cell repository.	27	a...
	[9/8/08 15:11:09:149 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0012I: Creating Node Agent configuration for node: h2nodeb	28	a...
1,279	[9/8/08 15:11:04:293 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU2010I: Stopping all server processes for node h2nodeb	24	a...
	[9/8/08 15:11:05:572 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0512I: Server h2sr01b cannot be reached. It appears to be stopped.	25	a...
768	[9/8/08 15:11:10:527 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0014I: Adding node h2nodeb configuration to cell: h2cell	32	a...
	[9/8/08 15:11:11:295 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0120I: WebSphereWSDM on CU will not be uploaded since it already exists in the target repository.	33	a...
693	[9/8/08 15:11:09:149 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0012I: Creating Node Agent configuration for node: h2nodeb	28	a...
	[9/8/08 15:11:09:842 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0120I: WebSphereWSDM.ear will not be uploaded since it already exists in the target repository.	29	a...
686	[9/8/08 15:12:21:688 EDT]	00000001 FileRepositor	W	BBOO0221W: ADMR0114W: The system is overwriting document cells/h2cell/variables.xml by request.	48	a...
	[9/8/08 15:12:22:374 EDT]	00000001 FileRepositor	A	BBOO0222I: ADMR0010I: Document cells/h2cell/variables.xml is modified.	49	a...
669	[9/8/08 15:12:37:707 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0020I: Reading configuration for Node Agent process: nodeagent	106	a...
	[9/8/08 15:12:38:376 EDT]	00000000 AdminTool	A	BBOO0222I: ADMU0022I: Node Agent launched. Waiting for initialization status.	107	a...
575	[9/8/08 15:12:25:886 EDT]	00000001 FileRepositor	A	BBOO0222I: ADMR0010I: Document cells/h2cell/cus/ibmasyncrsp/cver/BASE/cu.xml is modified.	88	a...
	[9/8/08 15:12:26:461 EDT]	00000001 FileRepositor	A	BBOO0222I: ADMR0009I: Document cells/h2cell/PolicySets/WAS-I RSP ND/policySet.xml is created.	89	a...

Log Analyzer – Importing Logs

Tivoli Log Analyzer opens in a new window

Click on File → Import Log from local system

Select log file → Symptom Catalog (WAS V.7) → Finish
wsadmin logs, verboseGC



Health Center:

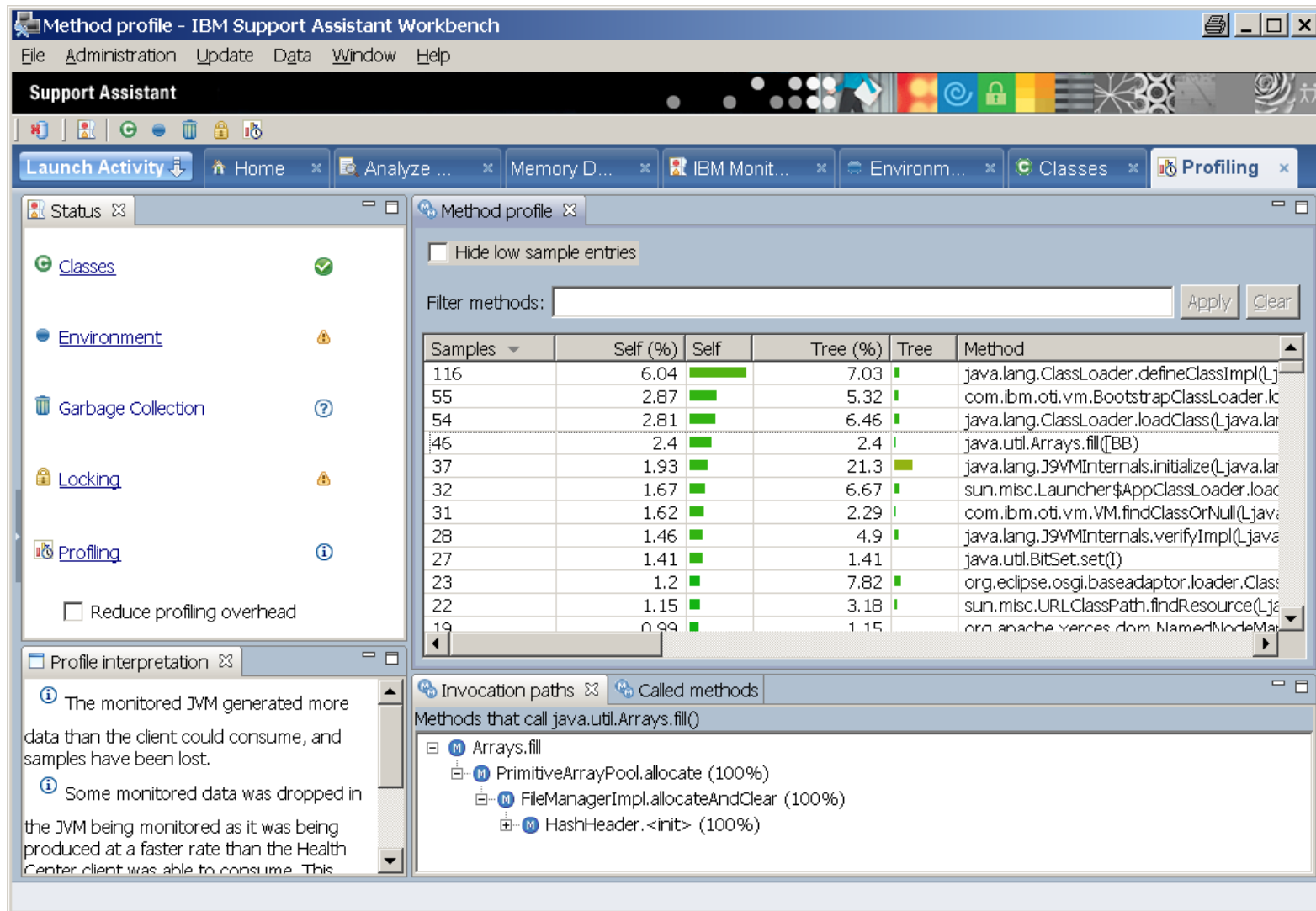
Real-time Monitor with low overhead

Intro - Information Sources:

- **YouTube videos**
 1. Overview of Health Center features
www.youtube.com/watch?v=5TcktcI0qxs
 2. Install IBM Support Assistant and Health Center
www.youtube.com/watch?v=6WjE9U0jvEk
 3. How to enable a Java application for live monitoring by the Health Center
www.youtube.com/watch?v=Hdp0mJ13NLQ
- **Enabling a server** (*very easy!*):
 - Add **-Xhealthcenter** to servant JVM properties
- **Using:** Launch from ISA with host & port (1972)
- **Views:**
 - Classes
 - Environment
 - Garbage Collection
 - Locking
 - Profiling
- **SHARE 113 (Denver) Presentation – Session 1153**

Health Center - Profiling

- Lower overhead *than Jinsight Live for z, but not as rich.*



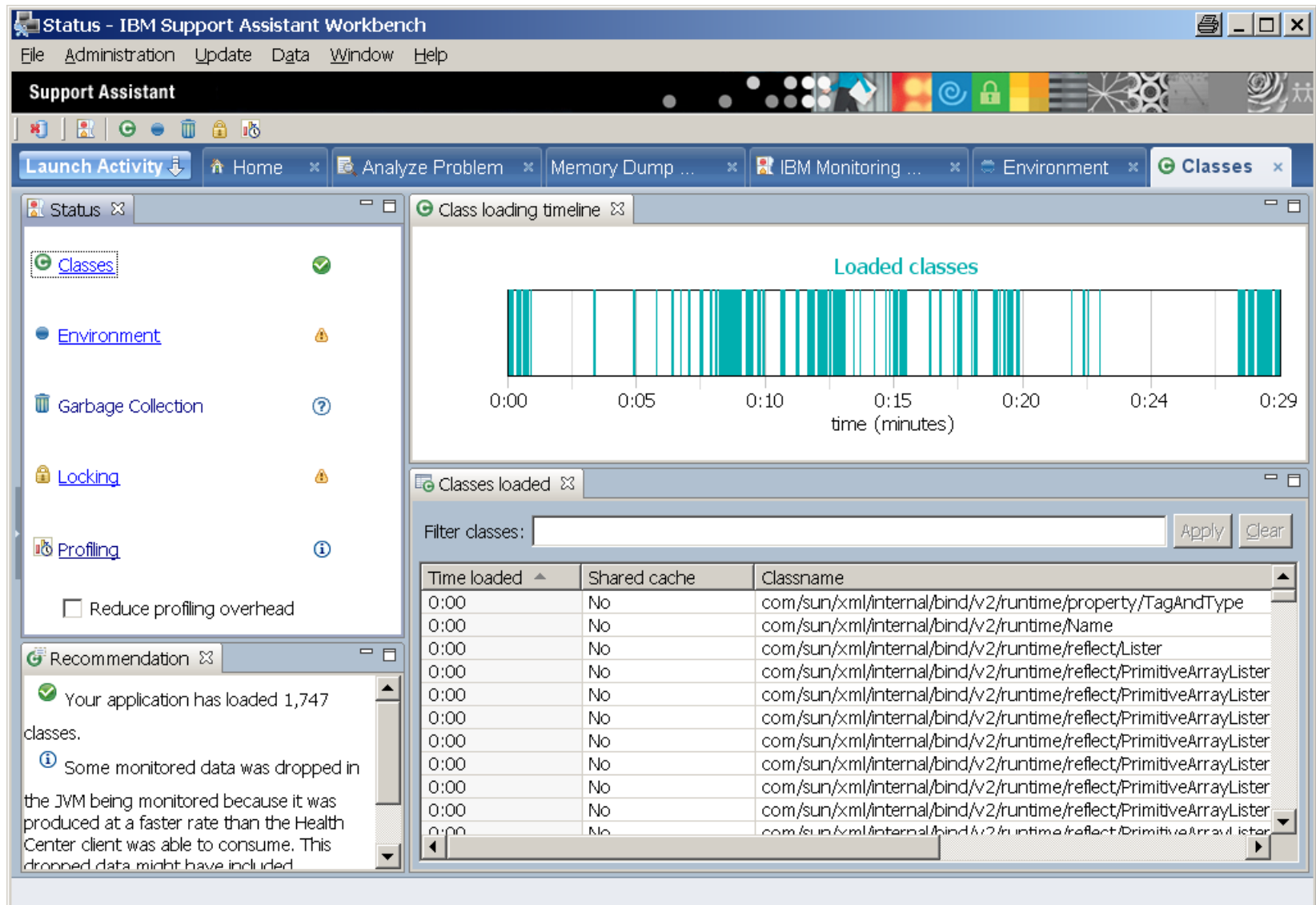
The screenshot shows the 'Method profile - IBM Support Assistant Workbench' window. The 'Method profile' tab is active, displaying a table of method profiles. The table has columns for 'Samples', 'Self (%)', 'Self', 'Tree (%)', 'Tree', and 'Method'. The 'Method' column lists various Java methods, including `java.lang.ClassLoader.defineClassImpl(Lj`, `com.ibm.oti.vm.BootstrapClassLoader.lc`, `java.lang.ClassLoader.loadClass(Ljava.la`, `java.util.Arrays.fill([BB)`, `java.lang.J9VMInternals.initialize(Ljava.la`, `sun.misc.Launcher$AppClassLoader.loa`, `com.ibm.oti.vm.VM.findClassOrNull(Ljava`, `java.lang.J9VMInternals.verifyImpl(Ljava`, `java.util.BitSet.set(I)`, `org.eclipse.osgi.baseadaptor.loader.Class`, `sun.misc.URLClassPath.findResource(Lja`, and `org.apache.xerces.dom.NamedNodeMap`.

The 'Invocation paths' tab is also visible, showing the methods that call `java.util.Arrays.fill()`. The invocation paths are:

- `Arrays.fill`
 - `PrimitiveArrayPool.allocate (100%)`
 - `FileManagerImpl.allocateAndClear (100%)`
 - `HashHeader.<init> (100%)`

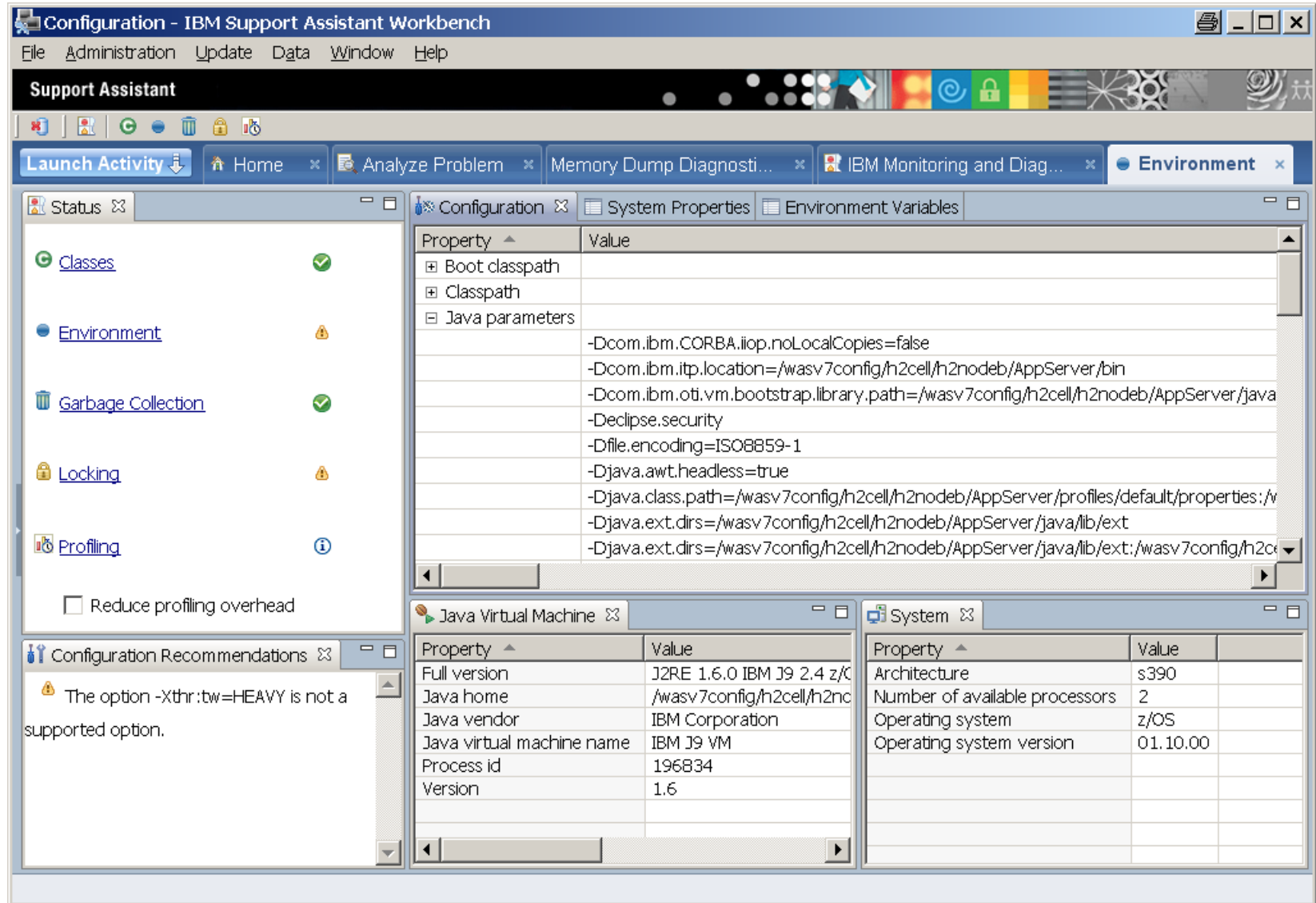
Health Center - Classes

- Timeline shows Class Loading frequency



Health Center - Environment

- Verify environmental variables, and Classpath setting



The screenshot shows the 'Configuration - IBM Support Assistant Workbench' window. The 'Environment' tab is selected, displaying a list of properties and their values. The 'Configuration Recommendations' pane on the left shows a warning about the option '-Xthr:tw=HEAVY'.

Configuration - IBM Support Assistant Workbench

File Administration Update Data Window Help

Support Assistant

Launch Activity Home Analyze Problem Memory Dump Diagnosti... IBM Monitoring and Diag... **Environment**

Status Configuration System Properties Environment Variables

Classes (green checkmark)

Environment (yellow warning icon)

Garbage Collection (green checkmark)

Locking (yellow warning icon)

Profiling (blue information icon)

☐ Reduce profiling overhead

Configuration Recommendations

The option -Xthr:tw=HEAVY is not a supported option.

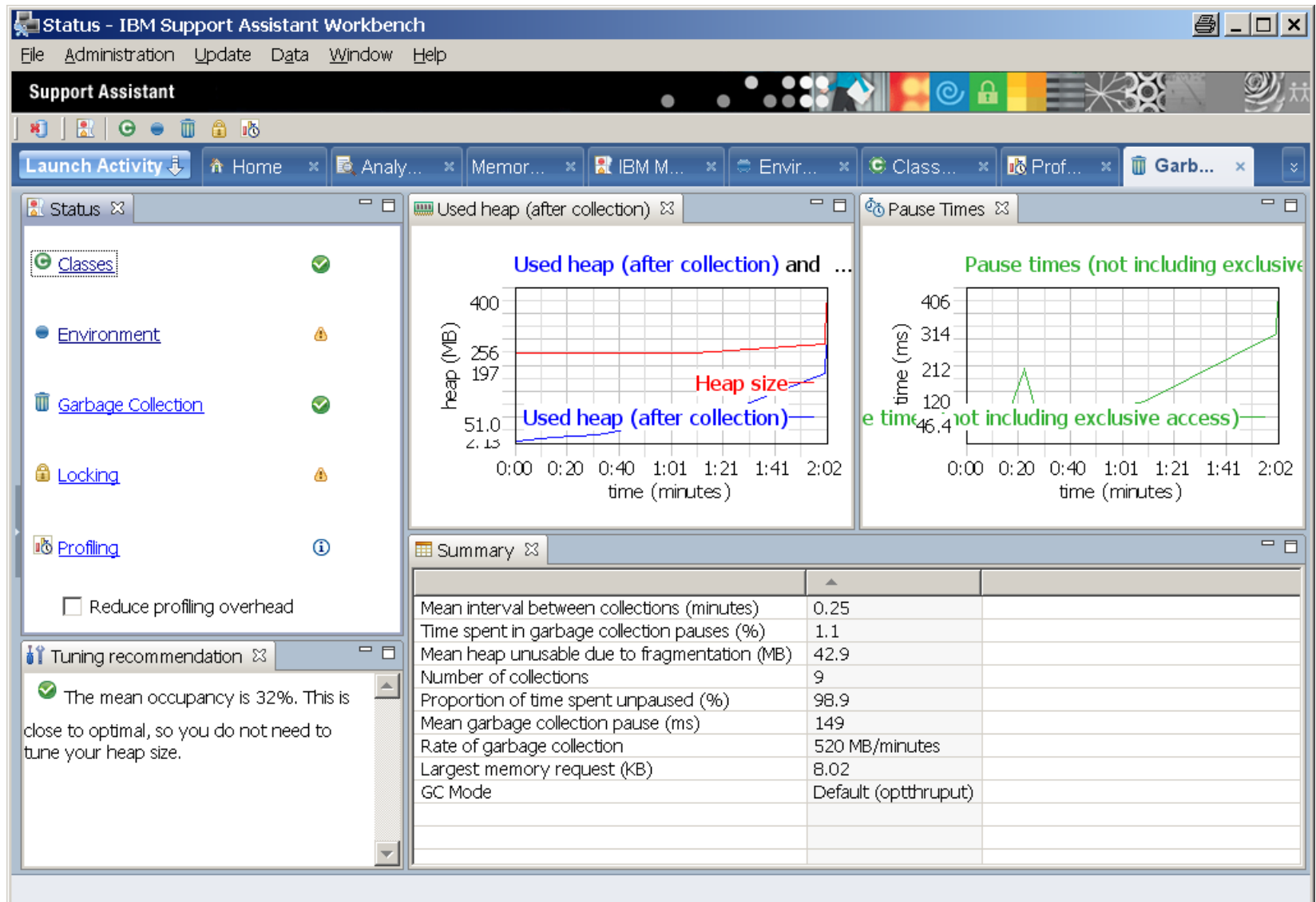
Property	Value
Boot classpath	
Classpath	
Java parameters	
	-Dcom.ibm.CORBA.iiop.noLocalCopies=false
	-Dcom.ibm.itp.location=/wasv7config/h2cell/h2nodeb/AppServer/bin
	-Dcom.ibm.oti.vm.bootstrap.library.path=/wasv7config/h2cell/h2nodeb/AppServer/java
	-Declipse.security
	-Dfile.encoding=ISO8859-1
	-Djava.awt.headless=true
	-Djava.class.path=/wasv7config/h2cell/h2nodeb/AppServer/profiles/default/properties:/w
	-Djava.ext.dirs=/wasv7config/h2cell/h2nodeb/AppServer/java/lib/ext
	-Djava.ext.dirs=/wasv7config/h2cell/h2nodeb/AppServer/java/lib/ext:/wasv7config/h2c

Property	Value
Full version	J2RE 1.6.0 IBM J9 2.4 z/C
Java home	/wasv7config/h2cell/h2nodeb
Java vendor	IBM Corporation
Java virtual machine name	IBM J9 VM
Process id	196834
Version	1.6

Property	Value
Architecture	s390
Number of available processors	2
Operating system	z/OS
Operating system version	01.10.00

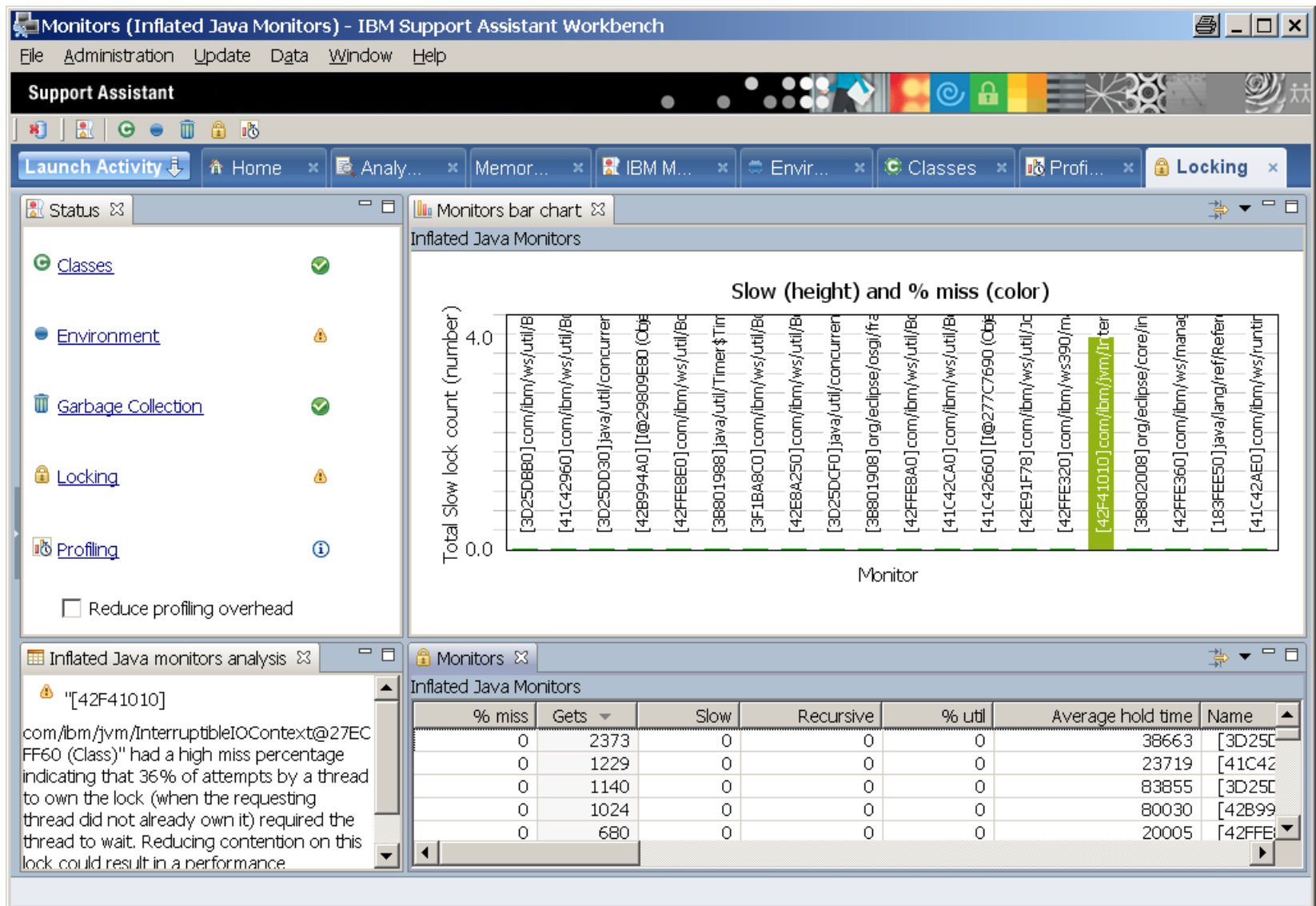
Health Center – Garbage Collection

- Graph shows Heap Use, Size, and Pause Times



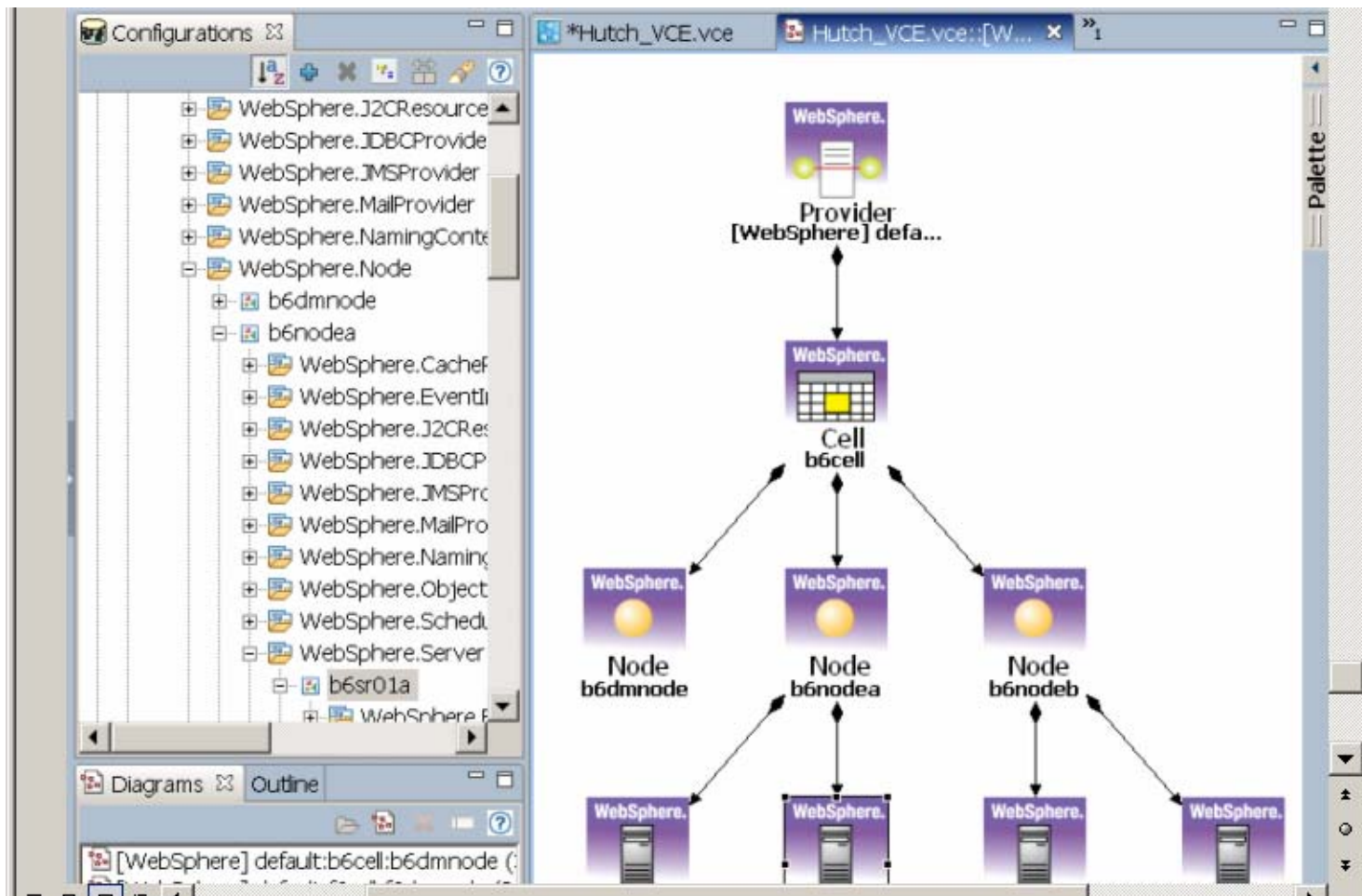
Health Center - Locking

- Identify Lock Contention and avg. Lock Hold Times



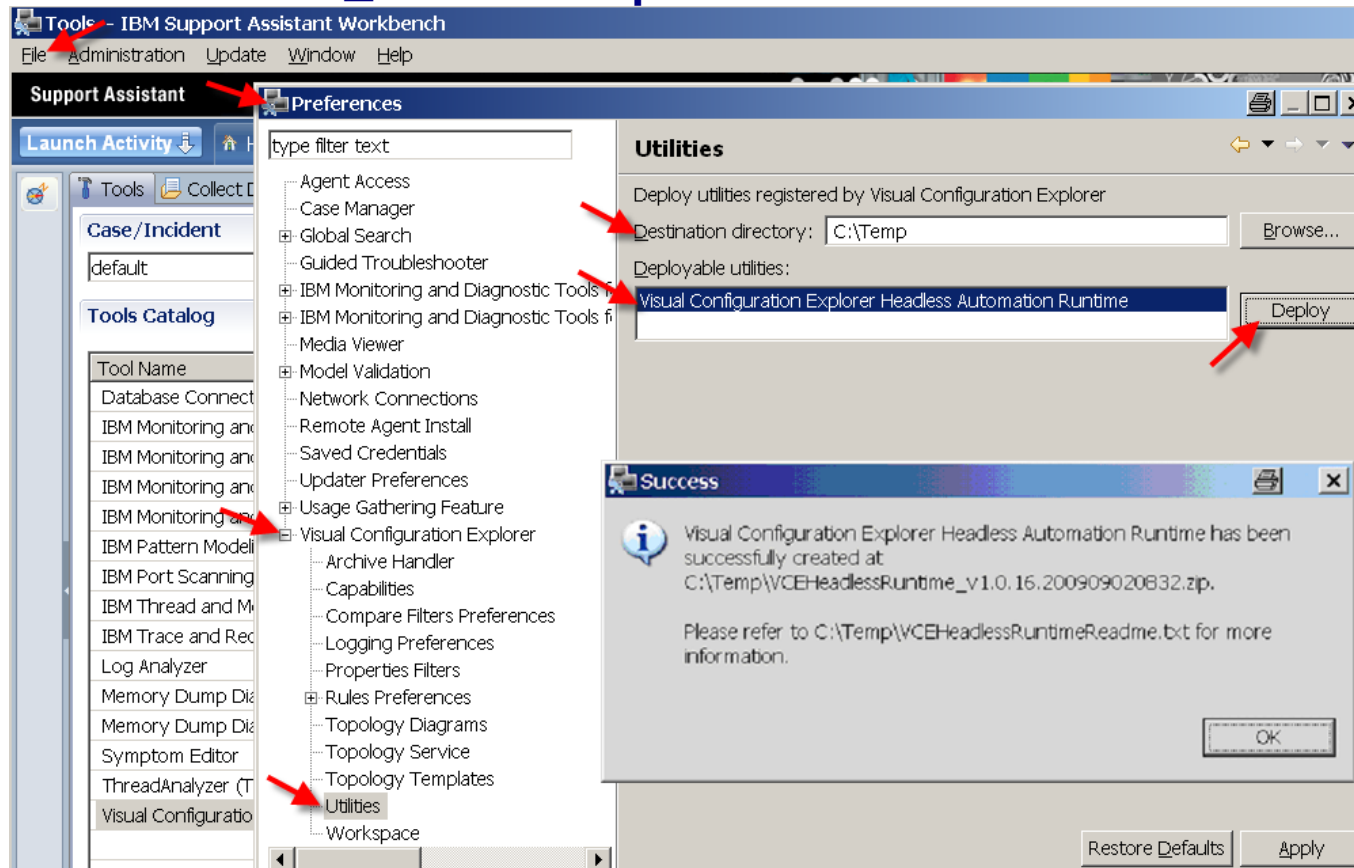
Visual Configuration Explorer (VCE)

Visualize, explore, and analyze configuration information
 Correlate configuration information between different products
 Collaborate with others during problem analysis
 Also see SHARE 113 Session 1153 for more examples...



ISA VCE “Headless Installation”

Click on File → Preferences → VCE → Utilities → “Deploy” to create **VCEHeadlessRuntime_V1.0...zip** file



Transfer zip file to your USS working directory, and unzip to ./vce dir.

```
jar -xvf VCEHeadlessRuntime_V1.0.15.20090624.0925.zip
```

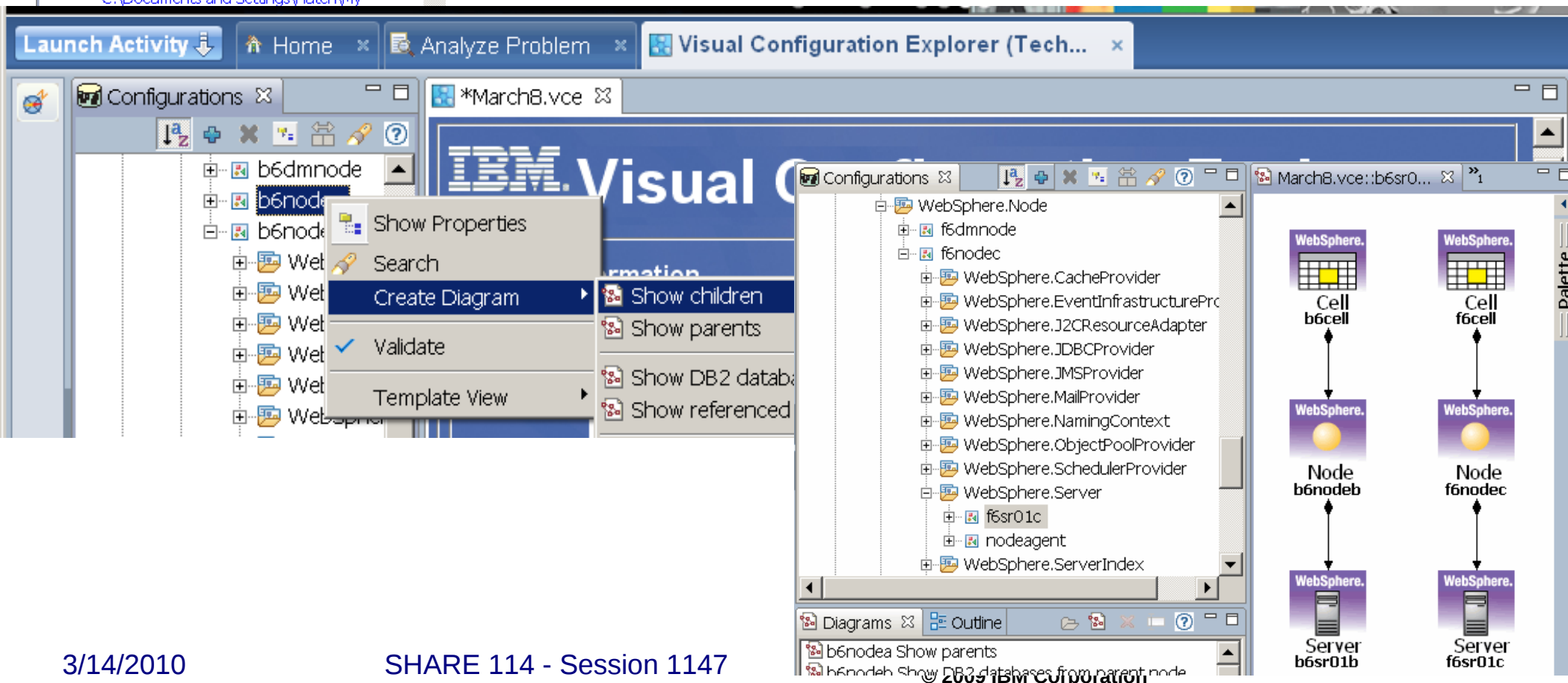
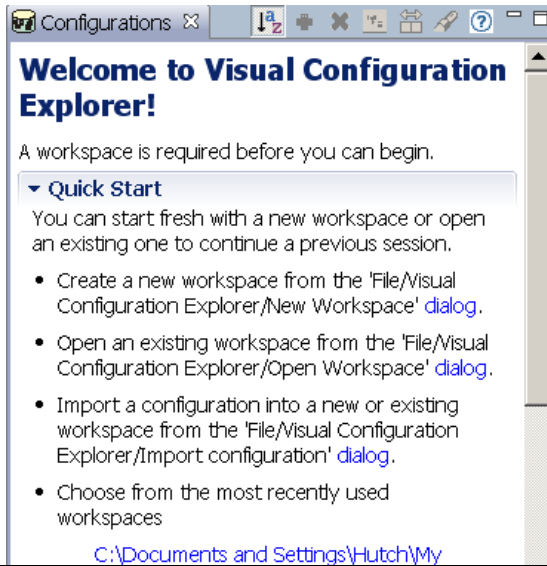
Run the exporter from ./vce/ directory after setting WAS_HOME:

```
Java jar startup.jar -buildfile wasexporter/wasexport.xml -Dwas.root=$WAS_HOME
```

FTP the wasexport.xml configuration file to your workstation and re-name it.

VCE Quick Start

- Create Workspace
- Add Configuration(s) Add Configuration  tool
- Create New Diagram New Diagram  tool
- Drag objects to diagram
- Show Parents or Children



Comparing Object Properties

- Right-Click on “Show Properties Node”
- Right-Click on “Compare Objects”



The screenshot shows the IBM Support Assistant Visual Configuration Explorer (Tech...) window. The left pane displays a tree view of configurations, with 'WebSphere.Security' selected and highlighted by a red arrow. The center pane shows a diagram of the security configuration, featuring two WebSphere cells (k1cell and b8cell) connected to a Security component. The right pane displays the 'Security/Security' configuration tree, with 'activeUserRegistry' selected and highlighted by a red arrow. Below the tree is a table with columns 'Property Name', 'Security Values', and 'Security Value'.

Property Name	Security Values	Security Value
≠ _WebSphere...	LocalOSUserRegistry	WIMUserRegistry
_WebSphere...	cells/b8cell security...	cells/k1cell security...
≠ _WebSphere...	{cell=b8cell}	{cell=k1cell}

Appendix

- **Installing the ISA**
- **Other Diagnostic Tools for WebSphere on z/OS**
 - MVS Modify (F) commands
- **Working with Dumps & Traces**
 - Triggering dumps & Traces
 - Extracting system dumps for ISA tools
- **Testing Tools & Sample Applications**
- **Documentation, Help & Web Resources**

WebSphere Application Server Sessions

Sess./Rm #	Day	Time	Title	Speaker
1076 / 303	Monday	11:00	WAS z/OS – Architecting Mixed-Platform Cells	Don Bagwell
1179 / 620	Monday	1:30	WAS z/OS – Java Out Of Memory (OOM) Analysis Hands-on Lab	Michael Stephen Ken Irwin
1065 / 303	Monday	4:30	WebSphere Application Server Latest Status	Dave Follis
1089 / 310	Tuesday	11:00	WebSphere for z/OS Migration – Walk Through, Warnings and Feedback	Mike Stephen Mickey Scott
1107 / 307	Tuesday	3:00	WebSphere for z/OS – I am no longer a dummy but...	Don Bagwell
1064 / 303	Tuesday	4:30	Which platform should I use for my WebSphere Application?	Mickey Scott
1147 / 310	Wednesday	3:00	Introduction to using IBM Support Assistant for WebSphere Application Server for z/OS	John Hutchinson
1143 / 310	Wednesday	4:30	Avoiding the potholes on the WebSphere Application Server for z/OS Onramp	Mike Loos
1172 / 310	Wednesday	6:00	WAS z/OS – Making Use of Optimized Local Adapters	Don Bagwell
1074 / 303	Thursday	8:00	Security Architecture – How does WebSphere play?	Bill O'Donnell
1075 / 303	Thursday	9:30	WebSphere Application Server Version 7 Management Strategies	Paul Houde
1077 / 6A	Thursday	1:30	WAS z/OS – High Availability Architectural Considerations	Don Bagwell

Installing the IBM Support Assistant (ISA)

- Download & Install ISA
 - <http://www.ibm.com/software/support/isa/>
 - See IEA (IBM Education Assistant) for tutorials:
 - http://publib.boulder.ibm.com/infocenter/ieduasst/v1r1m0/index.jsp?topic=/com.ibm.iea.selfassist/selfassist/ISAv41_Task.html
 - Install Product Add-ons: (100's)
 - ISA: Update > Find New... > Tools Add-ons
 - <http://www.ibm.com/support/docview.wss?uid=swg27013279>

Other Diagnostic Tools for WebSphere

- WebSphere “built-in” tools (See InfoCenter)
 - Display server - MVS Modify commands
 - Trace Dynamically - MVS Modify (F) commands
 - Performance Monitor (PMI) & Viewer
 - threadmonitor (WAS V7)
 - dumpNameSpace
 - wsadmin
 - ISC
- Other:
 - JinsightLive for IBM System z
<http://www.alphaworks.ibm.com/tech/jinsightlive>



The all-powerful MVS Modify command

F <server_name>, HELP

- TRACEALL - Set overall trace level
- TRACEBASIC - Set basic trace components
- TRACEDetail - Set detailed trace components
- TRACESPECIFIC - Set specific trace points
- TRACEINIT - Reset to initial trace settings
- TRACENONE - Turn off all tracing
- JAVACORE - Generate jvm core dump
- HEAPDUMP - Generate jvm heap dump
- JAVATDUMP - Generate jvm tdump
- TRACEJAVA - Set java trace options

F <server_name>, DISPLAY, HELP

- LISTENERS - Display listeners
- CONNECTIONS - Display connection information
- TRACE - Display information about trace settings
- JVMHEAP - Display jvm heap statistics
- WORK - Display work elements
- ERRLOG - Display the last 10 entries in the error log
- THREADS - Display thread status

Working with Dumps

- **Java Dumps** > /var/home/... MVS console commands
 - **Heap:** MVS command: **F <server_name>, HEAPDUMP**
 - **Core:** **F <server_name>, JAVACORE**
 - **JVM TDUMP:** **F <server_name>, JAVATDUMP**

Heapdumps (and javacore) written to home dir
(Default = /var/WebSphere/home/cell/<servant Group ID>)
- **WebSphere ABEND dumps** > /var/home/...
- **SYSABEND & CEE Dumps** > JES SPOOL
- **SVC Dumps, ABEND Dumps** > SYS1.DUMP.Dyy
 - Setup Dump Options:
 - CD SET, SDUMP=(RGN)
 - D DUMP, 0
 - SDUMP- ADD OPTIONS (LSQA, RGN, TRT)
 - MVS Dump console command:
 - Dump COMM='title'
 - R nn, jobname=H7SR01AS

jextract - Convert SVC dump for Dump Analyzer

- jextract is shipped with the IBM JVM in the ../java/bin/ directory
- Point directly to the Dump dataset:

```
/shared/zWebSphere/V7R0/java64/J6.0_64/bin/jextract SYS1.DUMP.D091014.T102814.SYSB.S00003
Loading dump file...
Read memory image from SYS1.DUMP.D091014.T102814.SYSB.S00003
Set debug scratch space size to 8 MB
VM set to 000000080B178548
Dumping JExtract file to SYS1.DUMP.D091014.T102814.SYSB.S00003.xml
<!-- extracting gpf state --> <!-- 5ms -->
<!-- extracting host network data --> <!-- 9ms -->
<!-- extracting classes --> <!-- 183200ms -->
<!-- extracting monitors --> ..<!-- 188234ms -->
<!-- extracting threads --> .<!-- 195727ms -->
<!-- extracting trace buffers --> <!-- 195740ms -->
<!-- extracting roots -->.<!-- 199500ms -->
<!-- extracting objects --> .<!-- 268266ms -->
Finished writing jextract XML file in 268268ms
Warning: found 14 inconsistencies in the dump file. Further information has been written to the
jextract XML file
Creating archive file: SYS1.DUMP.D091014.T102814.SYSB.S00003.zip
Adding "SYS1.DUMP.D091014.T102814.SYSB.S00003"
Adding "SYS1.DUMP.D091014.T102814.SYSB.S00003.xml"
Adding "/shared/zWebSphere/V7R0/java64/J6.0_64/lib/TraceFormat.dat"
Adding "/shared/zWebSphere/V7R0/java64/J6.0_64/lib/J9TraceFormat.dat"
jextract complete..
```

- FTP the resulting .zip file to your workstation.
- May have to specify these arguments:
export J9DBGEXT_SCRATCH_SIZE=8
jextract -J-DJavaio.tmpdir=/u/hutch/largezfs-Xmx1024 SYS1.DUMP.D091014.

jdumpview - Replaced by the ISA Dump Analyzer or Memory Analyzer?

Testing Tools

- Load Drivers
 - JMeter
 - Microsoft TM Web Application Stress Tool
 - LoadRunner, Silk, ...
- Sample Applications
 - Memory Leak
 - PD Application Tools – Techdoc 123456 (Ed Mc.)

ISA Documentation

- ISA Information (local eclipse)
 - Find Information & Search
 - ISA Help
 - ISA Media Viewer
- IEA (IBM Education Assistant) tutorials:
 - http://publib.boulder.ibm.com/infocenter/ieduasst/v1r1m0/index.jsp?topic=/com.ibm.iea.selfassist/selfassist/ISAv41_Task.html
- DeveloperWorks
 - <http://www.ibm.com/developerworks/websphere>
- ISA Forum
 - <http://www.ibm.com/developerworks/forums/forum.jspa?forumID=935>
- YouTube
 - 3 “How To” Demos for the ISA Health Center

ISA Find Information - Search

Support Assistant

Launch Activity ↓

Home ×

Analyze Problem ×

Find Information ×

Search Information

Media Viewer

Product Information

IBM Support Assistant Search

Support Assistant

Launch Activity ↓

Home ×

Analyze Problem ×

Find Information ×

Collect and Send Data ×

Search Information

Media Viewer

Product Information

IBM Support Assistant Search

Search: z/OS "Process Server"

Go!

[Advanced Search](#)

▼ Search Targets

☒ IBM Software Support Doc

☒ IBM developerWorks

☒ IBM Newsgroups and Foru

☒ Google

☒ **Product Information**

► Search Targets

▼ Search Results

[Stop Searching](#)

IBM Software Support Documents (50 of 1523 result

[-] IBM developerWorks

Information Management (45 of 45 results)

Lotus (22 of 22 results)

Rational (11 of 11 results)

Tivoli (46 of 46 results)

WebSphere (50 of 1436 results)

IBM Newsgroups and Forums **(Results in progress.**

Google (31000 results)

[-] Product Information Centers

☒ WebSphere Application Server 7.0

☒ WebSphere Business Services Fabric 6.2

WebSphere Process Server 6.1 > WebSphere Process Server, Version 6.1

Uninstalling WebSphere Process Server for z/OS

Uninstalling WebSphere Process Server for z/OS

How do I uninstall WebSphere Process Server for z/OS?

Installing the documentation: WebSphere Process Server for z/OS

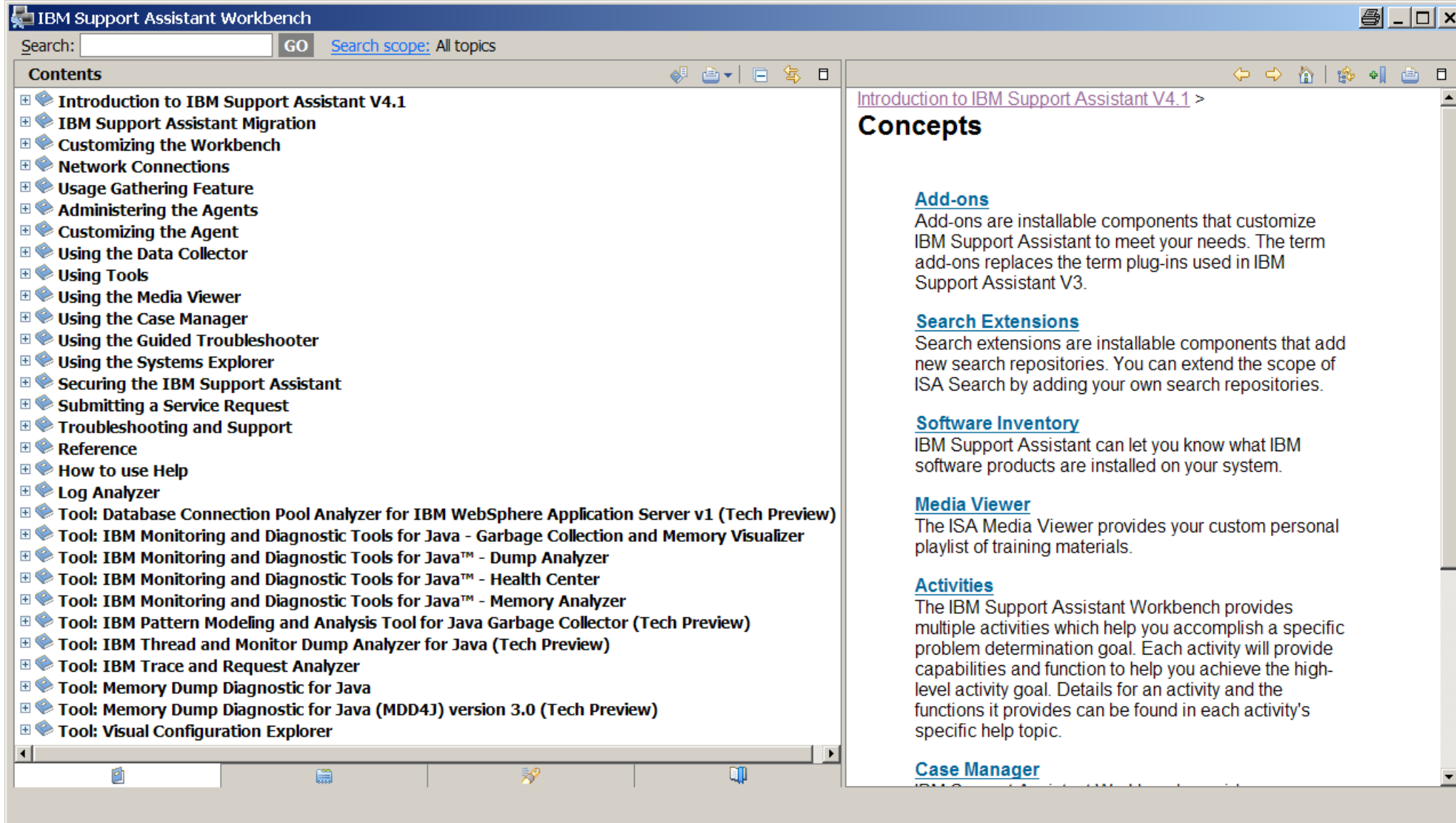
Coexisting WebSphere Process Server for z/OS in a single environment

Editing DB2 for z/OS scripts

Support for coexisting between WebSphere Process Server for z/OS and other products

ISA Help

- <http://localhost:1260/help/index.jsp>



The screenshot shows the IBM Support Assistant Workbench help interface. The title bar reads "IBM Support Assistant Workbench". Below the title bar is a search bar with the text "Search:" and a "GO" button, followed by a link "Search scope: All topics". The main content area is divided into two panes. The left pane, titled "Contents", lists various topics under a tree view, including "Introduction to IBM Support Assistant V4.1", "IBM Support Assistant Migration", "Customizing the Workbench", "Network Connections", "Usage Gathering Feature", "Administering the Agents", "Customizing the Agent", "Using the Data Collector", "Using Tools", "Using the Media Viewer", "Using the Case Manager", "Using the Guided Troubleshooter", "Using the Systems Explorer", "Securing the IBM Support Assistant", "Submitting a Service Request", "Troubleshooting and Support", "Reference", "How to use Help", "Log Analyzer", and several tools for IBM WebSphere Application Server v1 (Tech Preview), including Database Connection Pool Analyzer, Monitoring and Diagnostic Tools for Java (Garbage Collection and Memory Visualizer, Dump Analyzer, Health Center, Memory Analyzer), Pattern Modeling and Analysis Tool for Java Garbage Collector (Tech Preview), Thread and Monitor Dump Analyzer for Java (Tech Preview), Trace and Request Analyzer, Memory Dump Diagnostic for Java, and Visual Configuration Explorer. The right pane, titled "Introduction to IBM Support Assistant V4.1 > Concepts", contains sections for "Add-ons", "Search Extensions", "Software Inventory", "Media Viewer", "Activities", and "Case Manager". Each section provides a brief description of its functionality.

Contents

- Introduction to IBM Support Assistant V4.1
- IBM Support Assistant Migration
- Customizing the Workbench
- Network Connections
- Usage Gathering Feature
- Administering the Agents
- Customizing the Agent
- Using the Data Collector
- Using Tools
- Using the Media Viewer
- Using the Case Manager
- Using the Guided Troubleshooter
- Using the Systems Explorer
- Securing the IBM Support Assistant
- Submitting a Service Request
- Troubleshooting and Support
- Reference
- How to use Help
- Log Analyzer
- Tool: Database Connection Pool Analyzer for IBM WebSphere Application Server v1 (Tech Preview)
- Tool: IBM Monitoring and Diagnostic Tools for Java - Garbage Collection and Memory Visualizer
- Tool: IBM Monitoring and Diagnostic Tools for Java™ - Dump Analyzer
- Tool: IBM Monitoring and Diagnostic Tools for Java™ - Health Center
- Tool: IBM Monitoring and Diagnostic Tools for Java™ - Memory Analyzer
- Tool: IBM Pattern Modeling and Analysis Tool for Java Garbage Collector (Tech Preview)
- Tool: IBM Thread and Monitor Dump Analyzer for Java (Tech Preview)
- Tool: IBM Trace and Request Analyzer
- Tool: Memory Dump Diagnostic for Java
- Tool: Memory Dump Diagnostic for Java (MDD4J) version 3.0 (Tech Preview)
- Tool: Visual Configuration Explorer

Introduction to IBM Support Assistant V4.1 > Concepts

Add-ons
Add-ons are installable components that customize IBM Support Assistant to meet your needs. The term add-ons replaces the term plug-ins used in IBM Support Assistant V3.

Search Extensions
Search extensions are installable components that add new search repositories. You can extend the scope of ISA Search by adding your own search repositories.

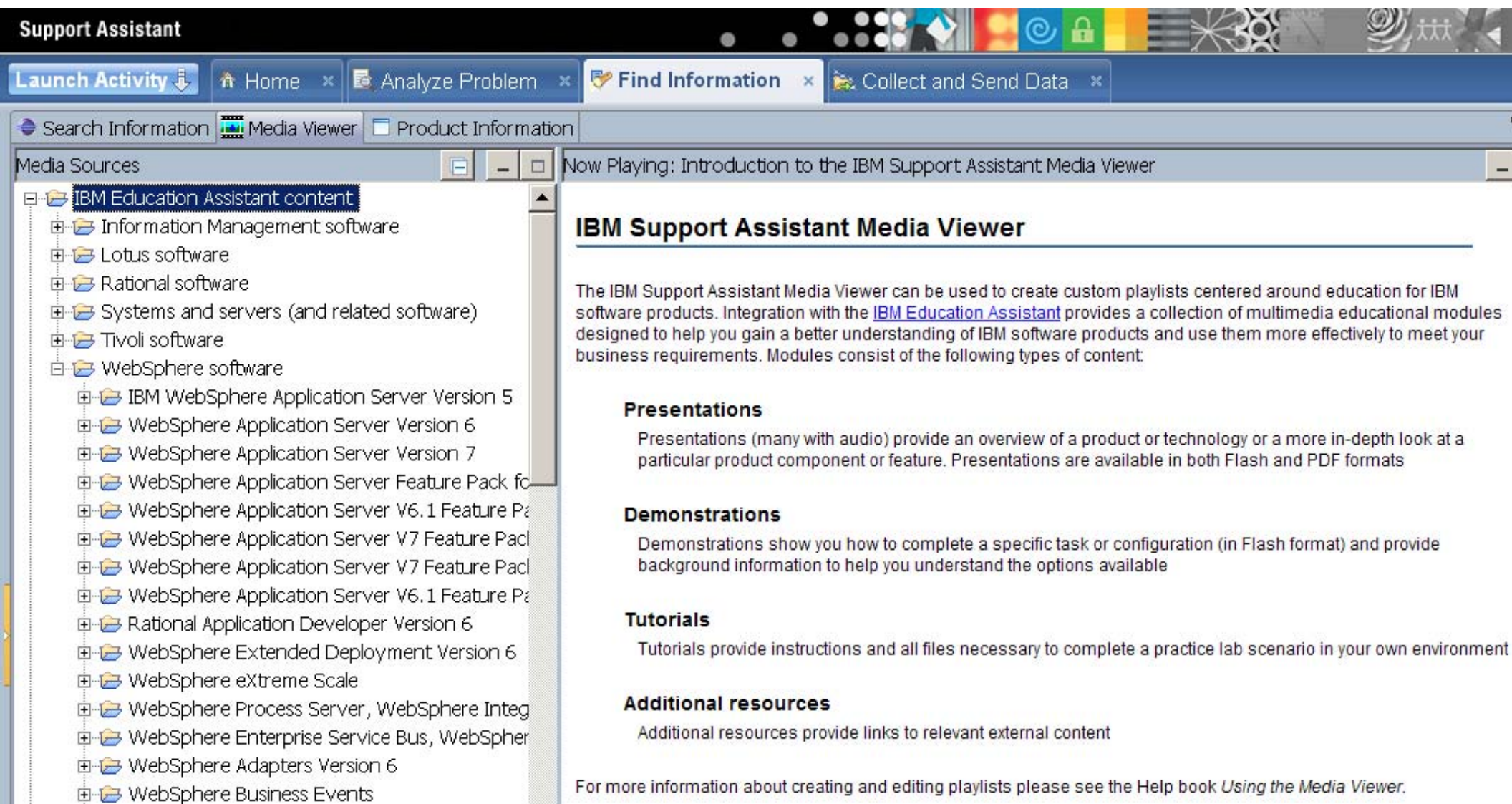
Software Inventory
IBM Support Assistant can let you know what IBM software products are installed on your system.

Media Viewer
The ISA Media Viewer provides your custom personal playlist of training materials.

Activities
The IBM Support Assistant Workbench provides multiple activities which help you accomplish a specific problem determination goal. Each activity will provide capabilities and function to help you achieve the high-level activity goal. Details for an activity and the functions it provides can be found in each activity's specific help topic.

Case Manager

ISA Media Viewer (uses local eclipse)



The screenshot shows the IBM Support Assistant Media Viewer application. The top bar includes a 'Support Assistant' title and a navigation menu with 'Launch Activity', 'Home', 'Analyze Problem', 'Find Information', and 'Collect and Send Data'. Below this is a search bar and tabs for 'Search Information', 'Media Viewer', and 'Product Information'. The 'Media Viewer' tab is active, showing a tree view of 'Media Sources' on the left and a main content area on the right. The tree view is expanded to show 'IBM Education Assistant content', which includes folders for 'Information Management software', 'Lotus software', 'Rational software', 'Systems and servers (and related software)', 'Tivoli software', and 'WebSphere software'. The 'WebSphere software' folder is further expanded, showing various versions and feature packs of WebSphere Application Server, Rational Application Developer, and WebSphere Extended Deployment. The main content area displays the title 'IBM Support Assistant Media Viewer' and a description of the application. It lists three types of content: Presentations, Demonstrations, and Tutorials, each with a brief description. At the bottom, there is a link to the Help book 'Using the Media Viewer'.

Support Assistant

Launch Activity | Home | Analyze Problem | Find Information | Collect and Send Data

Search Information | Media Viewer | Product Information

Media Sources

- IBM Education Assistant content
 - Information Management software
 - Lotus software
 - Rational software
 - Systems and servers (and related software)
 - Tivoli software
 - WebSphere software
 - IBM WebSphere Application Server Version 5
 - WebSphere Application Server Version 6
 - WebSphere Application Server Version 7
 - WebSphere Application Server Feature Pack for...
 - WebSphere Application Server V6.1 Feature Pa...
 - WebSphere Application Server V7 Feature Pac...
 - WebSphere Application Server V7 Feature Pac...
 - WebSphere Application Server V6.1 Feature Pa...
 - Rational Application Developer Version 6
 - WebSphere Extended Deployment Version 6
 - WebSphere eXtreme Scale
 - WebSphere Process Server, WebSphere Integ...
 - WebSphere Enterprise Service Bus, WebSpher...
 - WebSphere Adapters Version 6
 - WebSphere Business Events

Now Playing: Introduction to the IBM Support Assistant Media Viewer

IBM Support Assistant Media Viewer

The IBM Support Assistant Media Viewer can be used to create custom playlists centered around education for IBM software products. Integration with the [IBM Education Assistant](#) provides a collection of multimedia educational modules designed to help you gain a better understanding of IBM software products and use them more effectively to meet your business requirements. Modules consist of the following types of content:

Presentations

Presentations (many with audio) provide an overview of a product or technology or a more in-depth look at a particular product component or feature. Presentations are available in both Flash and PDF formats

Demonstrations

Demonstrations show you how to complete a specific task or configuration (in Flash format) and provide background information to help you understand the options available

Tutorials

Tutorials provide instructions and all files necessary to complete a practice lab scenario in your own environment

Additional resources

Additional resources provide links to relevant external content

For more information about creating and editing playlists please see the Help book *Using the Media Viewer*.

Resources

ISA website:

www.ibm.com/support/docview.wss?rs=3455&uid=swg27012682

www.ibm.com/support/docview.wss?rs=3455&context=SSLLVC&q1=vce&uid=swg27013116

ISA Download website www.ibm.com/software/support/isa/download.html

ISA V4.1.1 ReadMe www.ibm.com/support/docview.wss?uid=swg27016886

IBM Support Assistant Team www.ibm.com/software/support/isa

ISA Forum www.ibm.com/developerworks/forums/forum.jspa?forumID=935

Comments/feedback to: IBMSA@us.ibm.com

IBM Education Assistant (IEA) tutorials:

publib.boulder.ibm.com/infocenter/ieduasst/v1r1m0/index.jsp?topic=/com.ibm.iea.selfassist/selfassist/ISAv41_Task.html

IBM Diagnostics Guides www.ibm.com/developerworks/java/jdk/diagnosis/index.html

IBM Techdocs www.ibm.com/support/techdocs/WP101575 and [WP101612](http://www.ibm.com/support/techdocs/WP101612)