Eclipse Memory Analyzer
1.1 Release Review

Review Date: 1-8 June 2011
Community Channel:
• mailto:mat-dev@eclipse.org
• http://www.eclipse.org/forums/eclipse.memory-analyzer

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Introduction

• Memory Analyzer is a tool for heap dump analysis, which helps in analyzing memory leaks and high memory consumption of Java applications. It works fine with multi-million objects heap dumps and can quickly point to the suspicious objects and who is retaining them in the heap.

• Memory Analyzer was created as a sub-project under the Technology TLP in 2008 and moved under the Tools project in 2010

• It is part of the simultaneous release since Galileo

• [http://www.eclipse.org/mat](http://www.eclipse.org/mat)
Features

- Report memory leak suspects
- Report memory waste – redundant Strings, empty collections
- Calculate retained sizes
- Find who is keeping objects alive
- Query heap with an SQL-like language
- Works with multi GB heap dumps
- Supports various dump formats, e.g. HPROF, IBM PHD and system dumps
- Thread stack Information + Java locals
- Trigger heap dumps from within the tool
- Compare any two or more table-formatted results

+ Extract Ruby Related Details from the Heap Dumps
+ Set operations (union, etc...) on compared tables (from the same dump)
+ Accessibility improvements
Non-Code Aspects

• Documentation is generated using DITA
• Online documentation via
  – WIKI http://wiki.eclipse.org/index.php/MemoryAnalyzer
  – Webinar http://live.eclipse.org/node/520
  – Blog http://dev.eclipse.org/blogs/memoryanalyzer
• Cheat sheets

+ “Extending MAT Guide” (in Wiki):
  http://wiki.eclipse.org/index.php?title=MemoryAnalyzer/Contributor_Reference#Writing_plugins_for_the_Memory_Analyzer
The Memory Analyzer provides two major interfaces:

a) The **Snapshot API** provides access to the logical object graph inside the heap. It enables inspections that analyze collections, identify leak suspects etc.

b) The **Parser API** makes reading the raw heap dump format pluggable.

APIs conform with Eclipse Quality Standards.
Architectural Issues

Summary: Architecture is settled and performs well on multi-GB heap dumps
Tool Usability

• The Memory Analyzer tool is very helpful for troubleshooting of OutOfMemoryErrors. It can be also used proactively to analyze and reduce memory consumption.
• The tool provides rich and responsive UI.
• The sheer number of heap inspections can be overwhelming for a novice user.
End-Of-Life

• No features are removed
• No API has been deprecated / removed
Bugzilla

• Messages statistics
  – State 1.0, June 2010 (Total: 152, Open 40, Closed 112)
  – Current State, May 2011 (Total: 266, Open 59, Closed 207)

• Bugzilla used for discussions on new features / modifications
Standards

• MAT can work with:
  – HPROF binary dumps
  – IBM PHD dumps
  – IBM System dumps

• MAT Requires
  – Execution Environment J2SE-1.5
  – Eclipse Platform 3.4 – 3.7
  – Compatibility with Eclipse 4 has not been tested
  – BIRT Chart Runtime 2.3.0 or higher
UI Usability

• Follow User Interface Guidelines
• Multi-language support
  – UI Strings are externalized via Eclipse NLS
  – Memory Analyzer is part of Babel
• Accessibility improvements made since 1.0
  – Tracked in https://bugs.eclipse.org/bugs/show_bug.cgi?id=300655
  – Followed guidelines: http://www-03.ibm.com/able/guidelines/software/accesssoftware.html
Schedule

• Release 1.1.0 (June 2011)
  – Participate in the Indigo release

• Release 1.1.1 (TBD, Probably Indigo SP1)
  – Bugfixes for 1.1.0

• Release 1.2.0 (or 2.0.0 if API needs to be changed) (TBD, Juno)
  – Assure compliance with Eclipse 4
Communities

• Contributors and committers
  – Committers (total number 5): 4 from SAP, 1 from IBM
  – Active Committers are 2: 1 from SAP, 1 from IBM
  – Recently increasing number of non-committer contributions done via Bugzilla
    • A series of contributions related to Accessibility was made by several IBM developers

• Adopters
  – Integrated into SAP NetWeaver CE
  – Integrated into IBM Support Assistant
  – Integrated in Motorola’s MOTODEV Studio for Android
  – Some additional query and parser plugins are being written as shown by questions on the forum

• Users
  – A large user community (for the special niche of the tool)
  – The standalone RCP application has about 2000 downloads per week
  – Part of Helios update site (downloads not counted)
  – Forums and Bugzilla used as communication channel
IP Issues

- All plugins contain appropriate license files
- All committers have completed Eclipse Committer Agreements and have been approved by the PMC
- All non-committer contributions are properly marked in Bugzilla
- IP Log is submitted for approval
Project Plan

Available at

Future Themes

• Research / provide comparison based analysis
• Detect more anti-patterns automatically
• Assure compliance with Eclipse 4
• Continue work on a RAP version of MAT