

THE VIEW
LOTUS
DEVELOPER 2007

Writing, Debugging and Troubleshooting Domino Agents with Eclipse

Bob Balaban
Programming Services Architect
Lotus Notes & Domino
IBM Software Group

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What We'll Cover

- **Introduction**

- Java in Domino — why? (Reminder)
- Eclipse – It's not just about astronomy anymore
- The "Two-Headed Beast"
 - And why you will love him/her/it
- Demos: Simple and less-simple agents
- Demo: Building a real Java agent in Eclipse
- Java troubleshooting and performance issues
- Wrap-up

Introduction: Bob Balaban

- **Developer at Lotus/Iris 1987-1997**
- **123/G, 123/W, Notes Agent Manager, LotusScript/Java back-end classes for Notes...**
- **Founded Looseleaf Software, 1997**
- **Wrote many articles**
- **Wrote a book (*Programming Domino 4.6 With Java*)**
- **Re-joined IBM August, 2005**
- **Architect for Notes/SAP integration**
- **Currently Programming Services Architect for Notes and Domino**

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Assumption

- **You've already decided to build part of your application as an agent**
- **Why?**
 - **WQO/WQS agents are the core of Domino hosted Web applications**
 - **You might need scheduled functionality**
 - **You might need triggered functionality**
- **Agents: Not dead yet**

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Java in Domino

- **Why would we do that?**
 - Work with existing Java code
 - Multithreading
 - Easy network access
 - You might move it to J2EE later
- **Why would we NOT do that?**
 - No Java debugging in Designer
 - Domino support for Java lags the rest of the world

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Well, At Least We Can Fix the Debugging Problem

- **Eclipse!**
 - (Everything we're showing you can also be done in Rational Application Developer (RAD)...)
- **Actually, you could use ANY Java Integrated Development Environment (IDE)**
 - The Two-Headed Beast is friendly, works everywhere!

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The Two-Headed Beast Domino Agent

- **Head 1:**
 - A regular Java agent
 - Extends `lotus.domino.AgentBase`
 - Logic implemented in `NotesMain()`
 - Get Session from `AgentBase`
 - Get `AgentContext` from Session
 - Does its normal thing

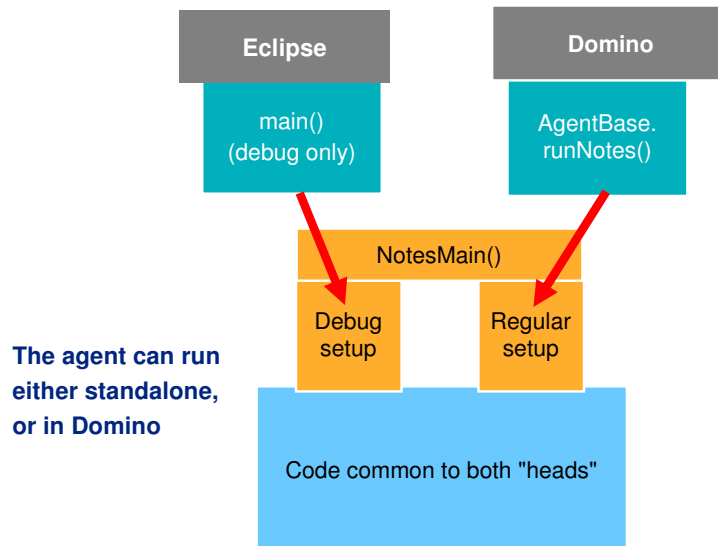
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Two-Headed Beast

- **Head 2:**
 - A standalone Java program
 - ▶ So we can debug it!
 - ▶ Has a `main()`
 - The `main()` function does all debugging setup:
 - ▶ Creates a Session
 - ▶ Points to "current" database, etc.
 - ▶ Invokes `NotesMain()`
 - ▶ Cleans up

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Two-Headed Beast, Diagram



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Notes on the Two-Headed-Beast Technique

- Works for any agent
- You might have to do extra setup
 - (We'll get to that in the second demo)
- You can remove the "debug head" for production
 - But why bother?
- You want as much of the code to be common to both heads as possible

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Setting up Eclipse to Use Notes JRE

- Needs to be done for compile-time (project properties)
- And for run-time (run configuration)

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Edit Project Properties

- Libraries tab
- “Add External Jar”, browse to notes\jvm\lib\ext\Notes.jar
- Or.... Set Notes as the default JRE:
 - Window menu → Preferences → Java → Installed JREs
 - Search, or add the Notes JRE
 - Select its checkbox

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Create a "Run Configuration"

- This is used at runtime, when you execute your program
 - You want Eclipse to use the Notes JRE for this too
- Run menu, "Run..." for EACH JAVA main program:
 - On the Arguments tab, add the following:
 - ▶ `-Dsun.boot.library.path=c:\\notes7:c:\\notes7\\jvm\\bin`
 - ▶ `-Djava.library.path=c:\\notes7:c:\\notes7\\jvm\\bin`
 - On the JRE tab, select Project JRE (Notes)
 - On the Environment tab, add a PATH variable pointing to your Notes/Domino executable directory
- I have not found a way to do this globally in Eclipse, but would gladly buy beer for anyone who can teach me

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Demo 1: Simple (Debuggable) Agent

- **Basic two-headed beast**
- **Really just a template**
 - Only prints the file path of the "current" database

Agent1.java

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Demo 2: Two-Headed Agent With Extra Setup

- **Shows extended customization technique:**
 - We want the agent to work on the UnprocessedDocuments collection
 - We write a class that extends AgentContext, ONLY used in debug case
 - We fake a DocumentCollection for testing
 - Custom AgentContext delivers the DocumentCollection to the Agent

Agent2.java
DebugAgentContext.java

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A Real Demo: Create a Domino Agent for a Web Service

- **Use RAD to automatically generate a Web Services client for Java**
 - Provide URL to the Web Service Definition Language (WSDL)
 - Use the client proxy class in your agent to invoke the service
 - Paste the proxy (and supporting JARs!) into a Domino agent

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A Real Demo: Create a Domino Agent for a Web Service

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 - ~~Paste the proxy (and supporting JARs!) into a Domino agent~~

TOO MUCH TYPING!!!

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Let's Use Notes 8 Instead

- (Ok, that "demo" was really just an excuse to show you a kewl new feature in Hannover...)
- **Web Services consumer in 8.0 — Java or LotusScript!**
- **Create a ScriptLib**
- **Import WSDL (from local file or URL)**
- **Wrap proxy class (Java or LS) with your code**
- **Done!**



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Wrap-Up

- **Web Services**
 - Very powerful technology to build applications around “loosely coupled components”
- Using code generators simplifies the task for the developer
- Domino 7 has the ability to host LotusScript and Java Web Services
- Notes 8 has the ability to consume Web Services using either LotusScript or Java

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Resources

- **WSDL Specs**
 - <http://www.w3.org/TR/wsdl>
- **SOAP Specs**
 - <http://www.w3.org/TR/soap/>
- **Bob Balaban's blog**
 - <http://www.bobzblog.com>

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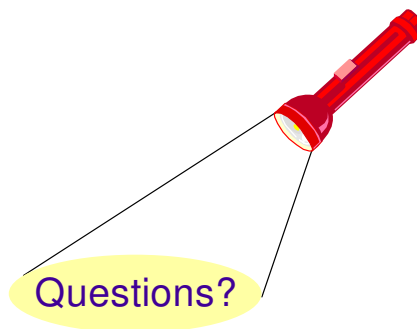
7 Key Points to Take Home

- **Two-Headed-Beast** technique makes it easy to debug
- **Always** provide a default constructor
- **Keep** as much of the code as common as possible
- **Create** your own Domino-extended objects to customize the debug case
- **Use** real data whenever possible

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Your Turn!

- **Please remember to fill out your evaluation**



How to Contact Me:
Bob Balaban
Email: Bob_balaban@us.ibm.com
Blog: www.bobzblog.com

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