REPLAY SOLUTIONS
accelerating you to market

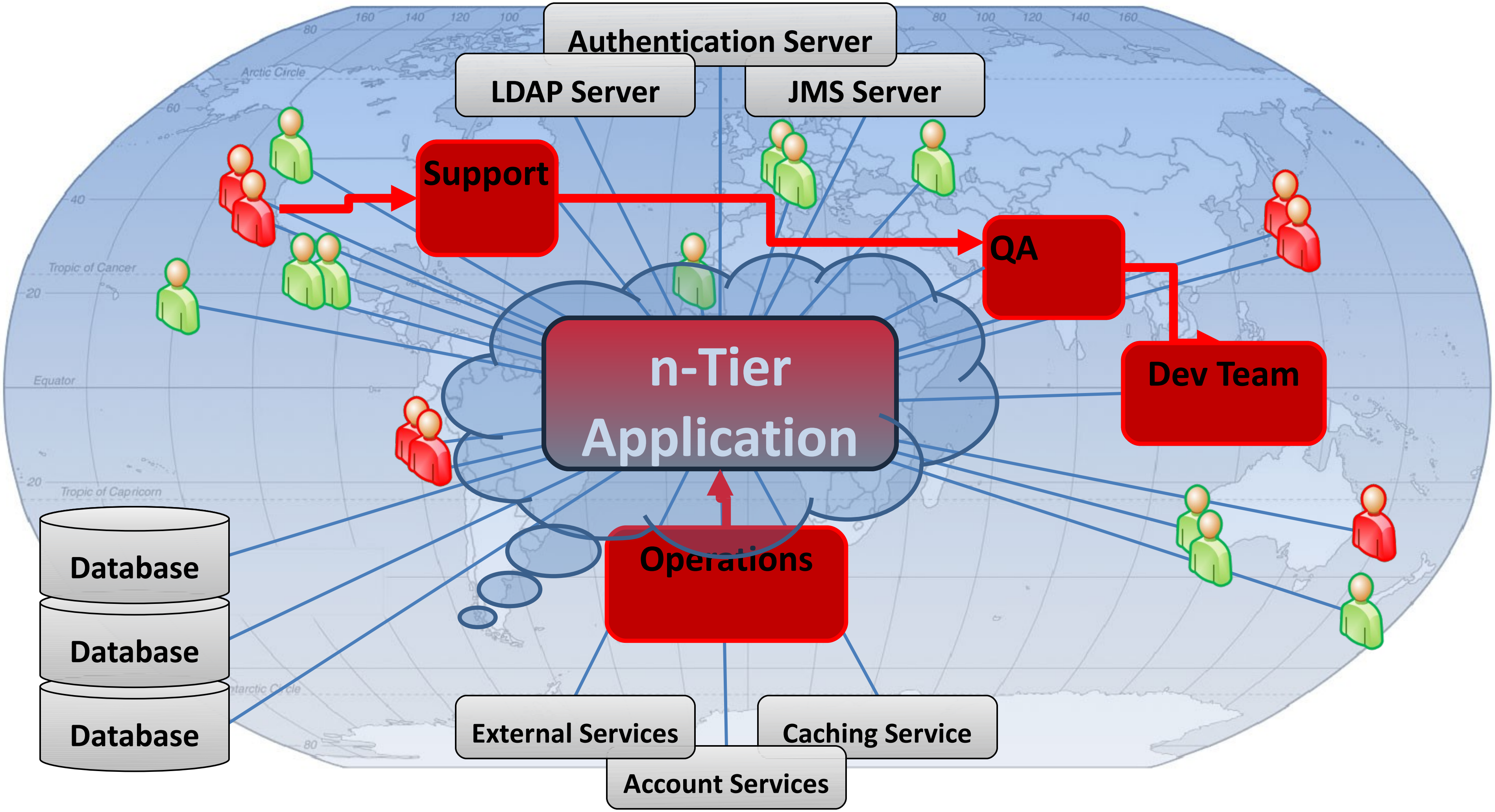
# Stop Wasting Time on Bugs!

## New Eclipse Record/Replay Plug-in

Jeff Daudel, CTO, Replay Solutions

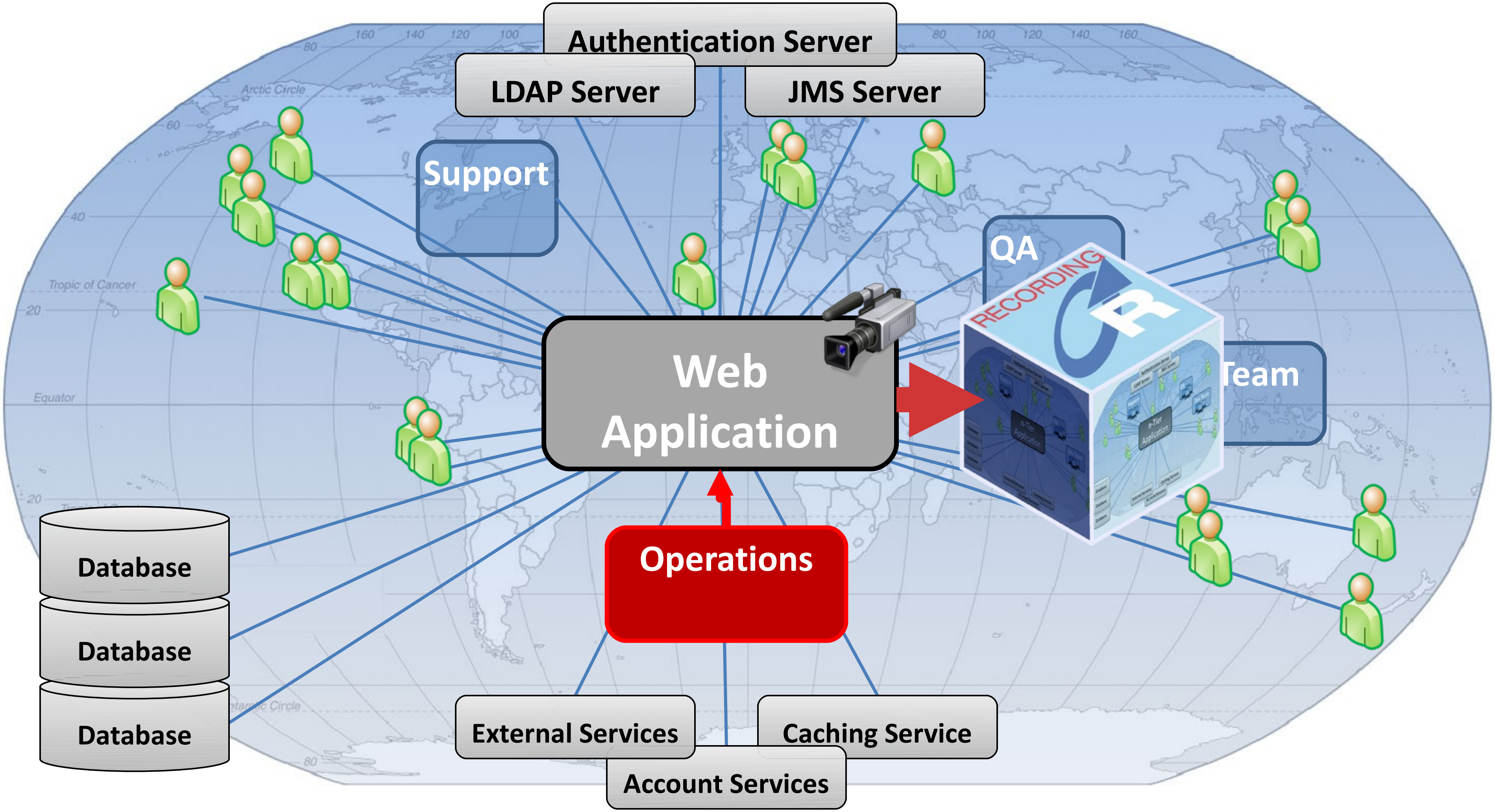
eclipse
FOUNDATION MEMBER ™

# Issues take time to reproduce and fix…


Authentication Server
LDAP Server
JMS Server
Support
QA
Dev Team
n-Tier Application
Operations
Database
Database
Database
External Services
Caching Service
Account Services
Arctic Circle
Tropic of Cancer
Equator
Tropic of Capricorn

**Free Whitepaper - http://bit.ly/replay_wp**

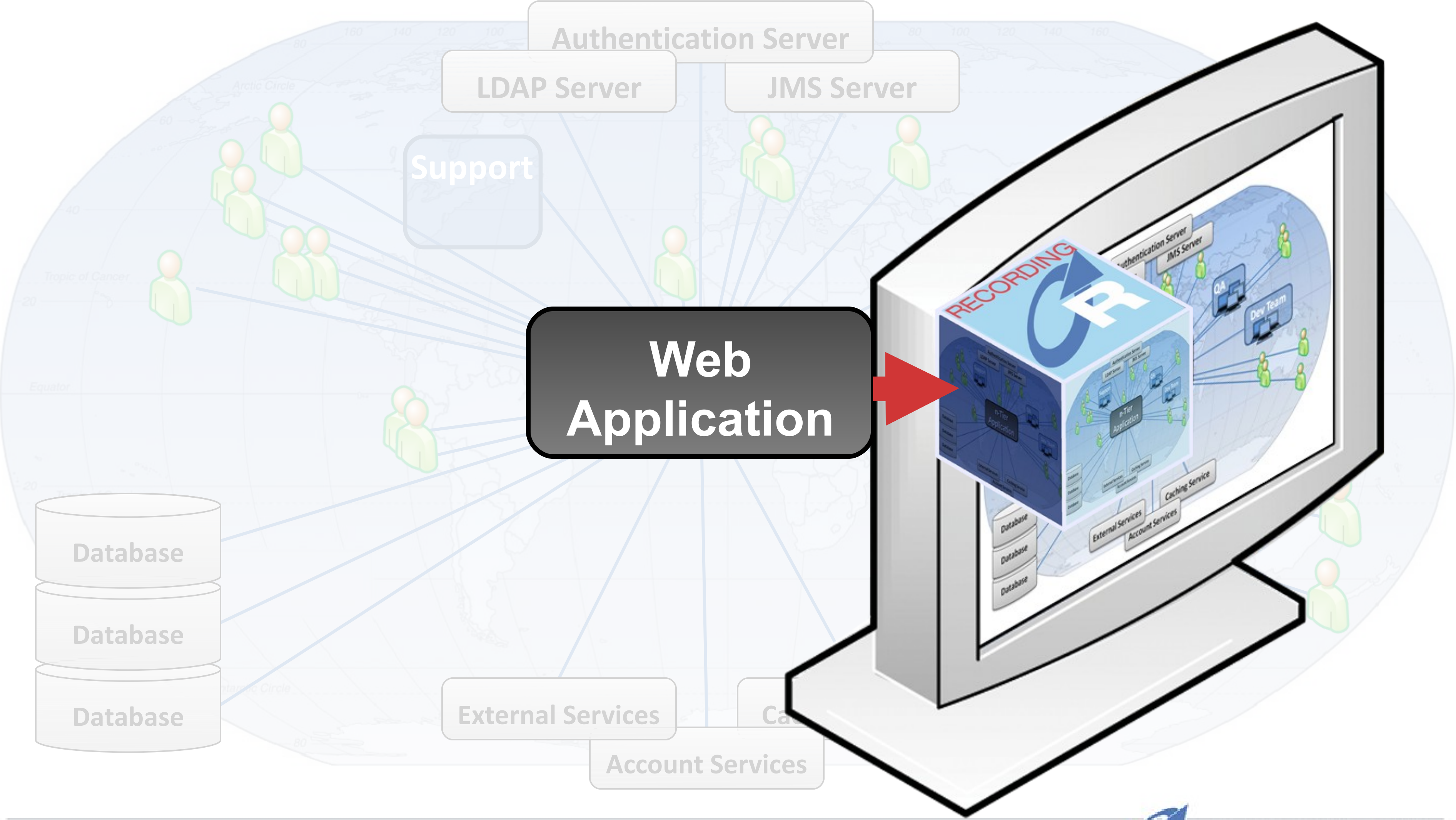
# ReplayDIRECTOR Records Everything


Authentication Server
LDAP Server
JMS Server
Support
QA
RECORDING
R
Team
Web Application
Operations
Database
Database
Database
External Services
Caching Service
Account Services
Arctic Circle
Tropic of Cancer
Equator

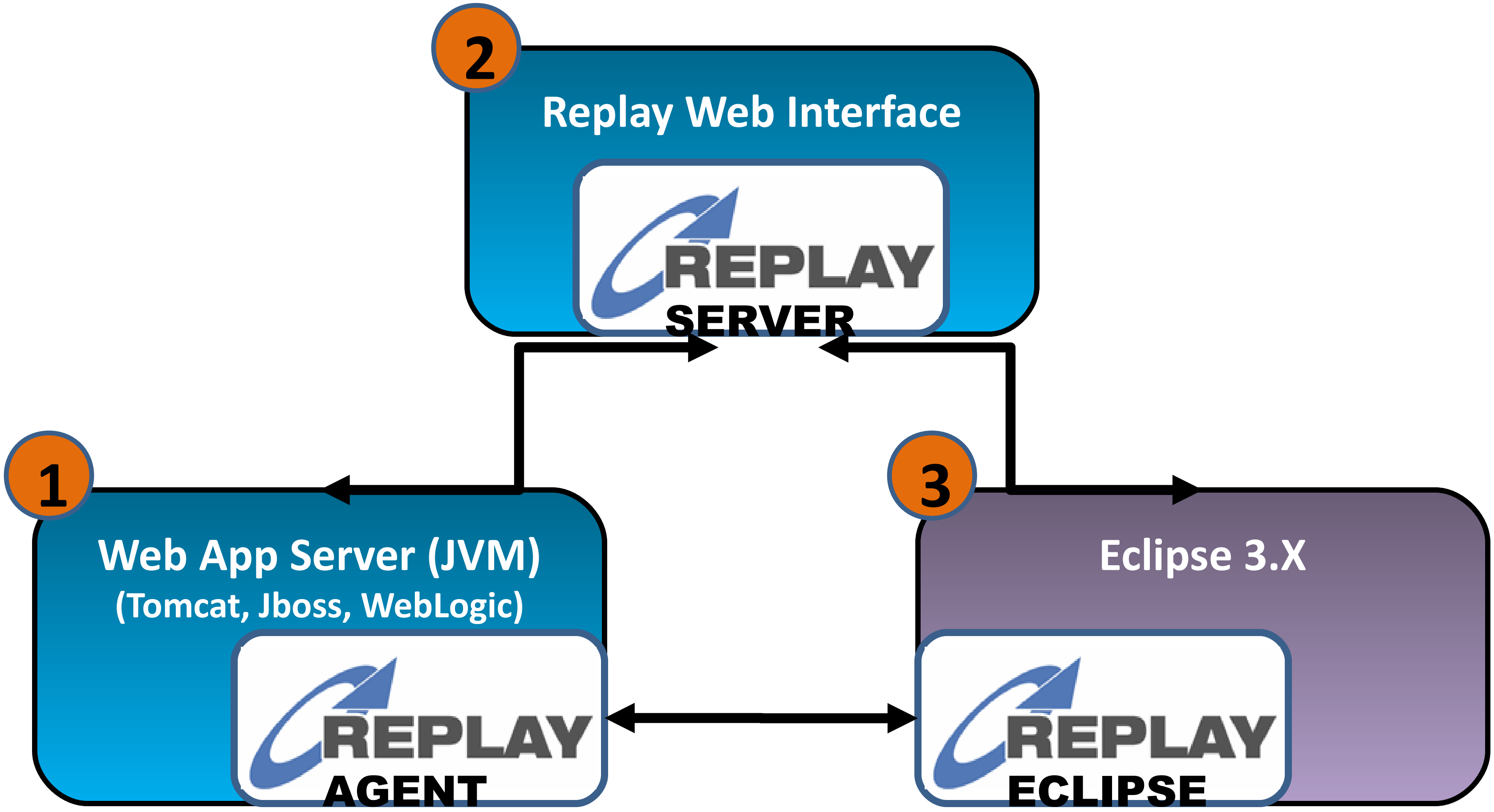
Download now - http://replaysolutions.com/download

REPLAY SOLUTIONS

# Allows you to Replay on a Single Workstation

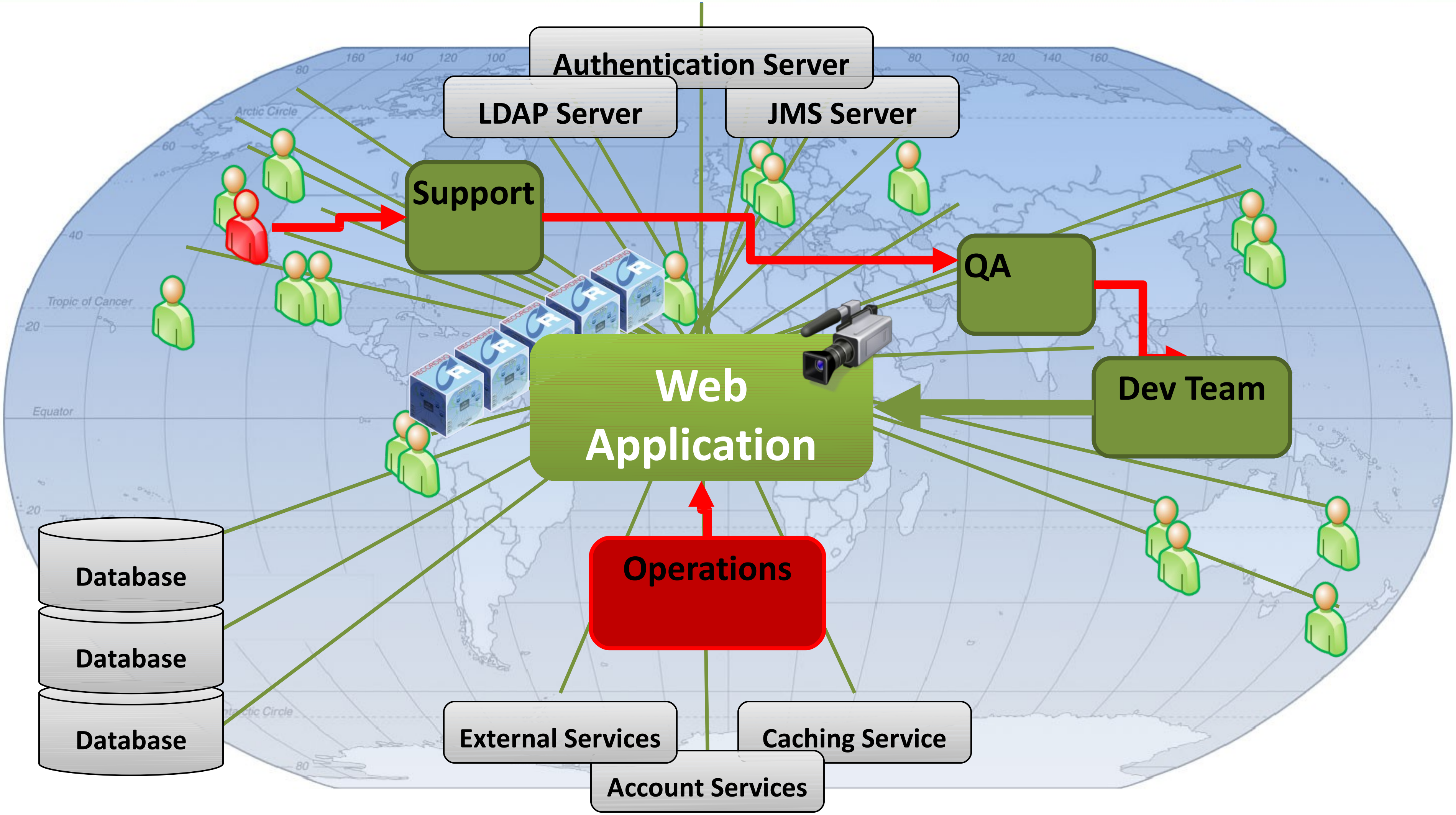

Authentication Server
LDAP Server
JMS Server
Support
Web Application
Database
Database
Database
External Services
Ca
Account Services
RECORDING
R
Authentication Server
JMS Server
QA
Dev Team
n-Tier Application
Caching Service
External Services
Account Services
Database
Database
Database

# ReplayDIRECTOR Architecture



2
Replay Web Interface
REPLAY
SERVER
1
Web App Server (JVM)
(Tomcat, Jboss, WebLogic)
REPLAY
AGENT
3
Eclipse 3.X
REPLAY
ECLIPSE

# Resolve Issues in Half The Time


Authentication Server
LDAP Server
JMS Server
Support
QA
Dev Team
Web Application
Operations
Database
Database
Database
External Services
Caching Service
Account Services
RECORDING
Arctic Circle
Tropic of Cancer
Equator

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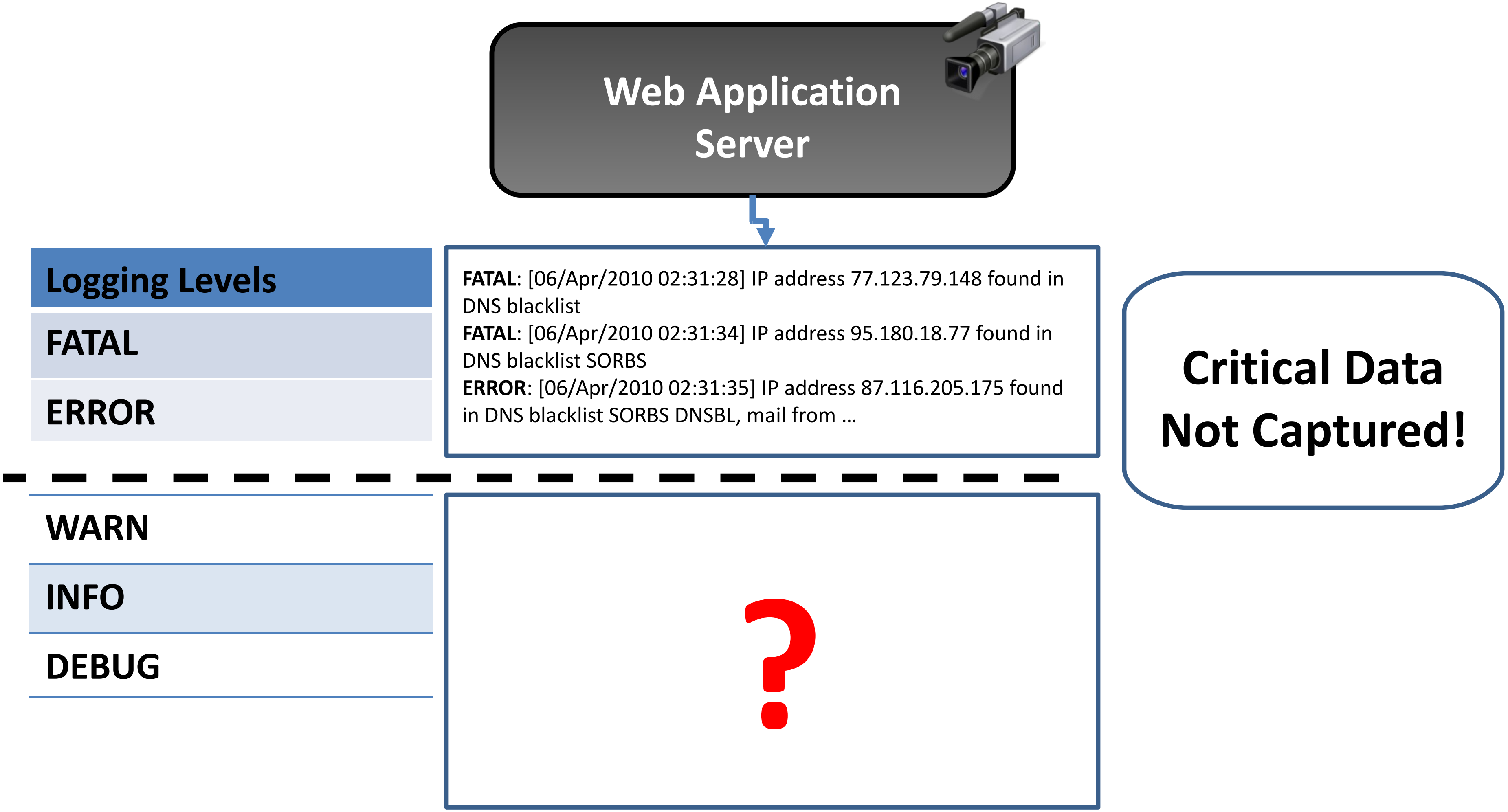
# Logging levels often too limited.

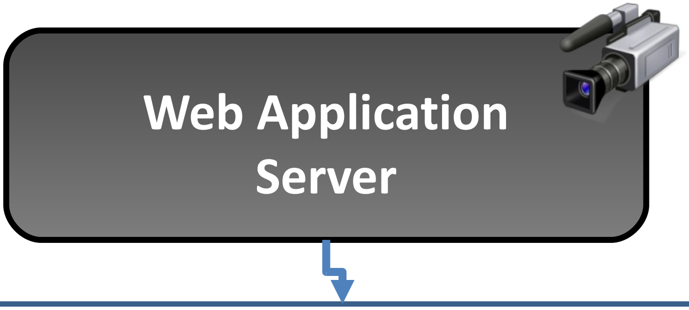


| Logging Levels |
|---|
| FATAL |
| ERROR |
| WARN |
| INFO |
| DEBUG |

```
FATAL: [06/Apr/2010 02:31:28] IP address 77.123.79.148 found in DNS blacklist
FATAL: [06/Apr/2010 02:31:34] IP address 95.180.18.77 found in DNS blacklist SORBS
ERROR: [06/Apr/2010 02:31:35] IP address 87.116.205.175 found in DNS blacklist SORBS DNSBL, mail from …
```

**Critical Data Not Captured!**

# Go Back in Time… Retrieve Critical Data



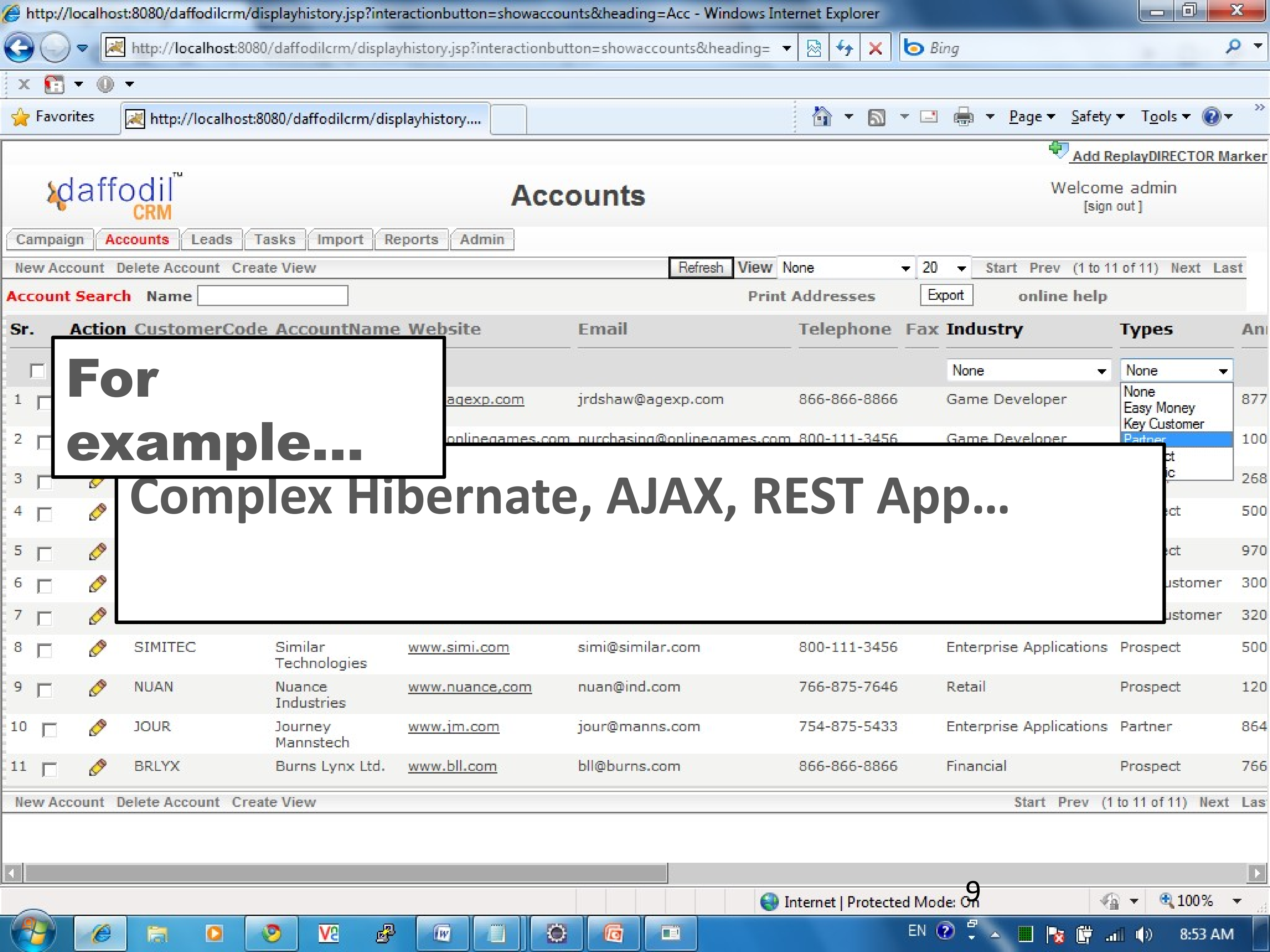
| Logging Levels |
|---|
| FATAL |
| ERROR |

```
FATAL: [06/Apr/2010 02:31:28] IP address 77.123.79.148 found in
DNS blacklist
FATAL: [06/Apr/2010 02:31:34] IP address 95.180.18.77 found in
DNS blacklist SORBS
ERROR: [06/Apr/2010 02:31:35] IP address 87.116.205.175 found
in DNS blacklist SORBS DNSBL, mail from …
```

| |
|---|
| WARN |
| INFO |
| DEBUG |

```
WARNING: [06/Apr/2010 02:31:28] IP address 77.123.79.148
found in DNS
WARNING: [06/Apr/2010 02:31:34] IP address 95.180.18.77
found in DNS
INFO: [06/Apr/2010 02:31:35] IP address 87.116.205.175 found in
DNS blacklist
DEBUG: SORBS DNSBL, mail from
[06/Apr/2010 02:32:57] IP address
DEBUG: SORBS DNSBL, mail from
[06/Apr/2010 02:32:57] IP address 74.77.70.88
```

**View detailed Log Messages after the Event during Replay**


http://localhost:8080/daffodilcrm/displayhistory.jsp?interactionbutton=showaccounts&heading=Acc - Windows Internet Explorer
Bing
Favorites
Page
Safety
Tools
Add ReplayDIRECTOR Marker
daffodil CRM
Campaign
Accounts
Leads
Tasks
Import
Reports
Admin
New Account
Delete Account
Create View
Refresh
Start
Prev
Next
Last
Print Addresses
Export
online help
Internet | Protected Mode: On
100%
EN
8:53 AM

# For example...

## Complex Hibernate, AJAX, REST App...

**Accounts**

Welcome admin
[sign out ]

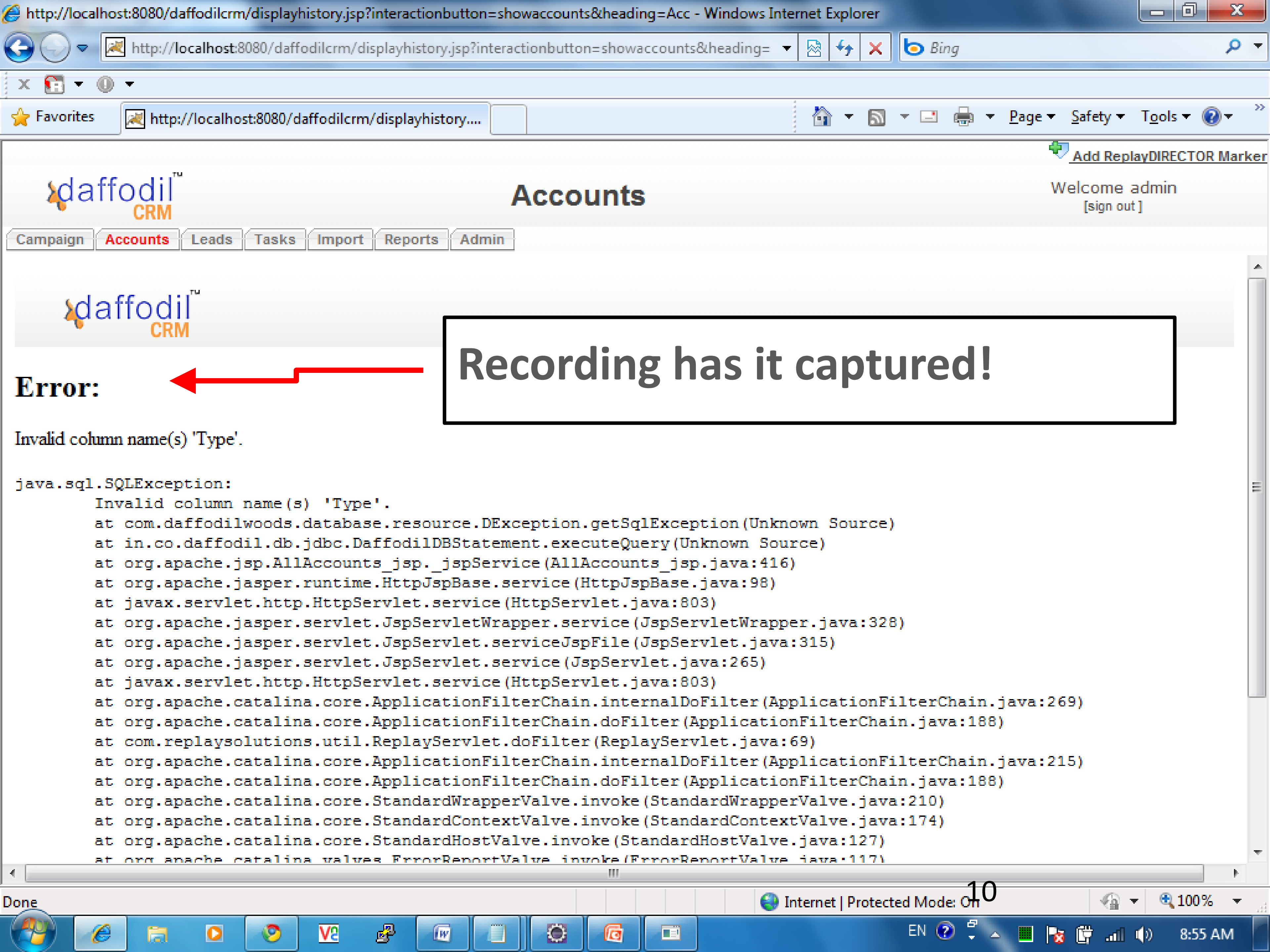
View None 20 (1 to 11 of 11)

**Account Search** **Name**

| Sr. | Action | CustomerCode | AccountName | Website | Email | Telephone | Fax | Industry | Types | An |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | | | | | | | | None | None | |
| 1 ☐ | | | | agexp.com | jrdshaw@agexp.com | 866-866-8866 | | Game Developer | | 877 |
| 2 ☐ | | | | onlinegames.com | purchasing@onlinegames.com | 800-111-3456 | | Game Developer | | 100 |
| 3 ☐ | | | | | | | | | | 268 |
| 4 ☐ | | | | | | | | | ct | 500 |
| 5 ☐ | | | | | | | | | ct | 970 |
| 6 ☐ | | | | | | | | | ustomer | 300 |
| 7 ☐ | | | | | | | | | ustomer | 320 |
| 8 ☐ | | SIMITEC | Similar Technologies | www.simi.com | simi@similar.com | 800-111-3456 | | Enterprise Applications | Prospect | 500 |
| 9 ☐ | | NUAN | Nuance Industries | www.nuance.com | nuan@ind.com | 766-875-7646 | | Retail | Prospect | 120 |
| 10 ☐ | | JOUR | Journey Mannstech | www.jm.com | jour@manns.com | 754-875-5433 | | Enterprise Applications | Partner | 864 |
| 11 ☐ | | BRLYX | Burns Lynx Ltd. | www.bll.com | bll@burns.com | 866-866-8866 | | Financial | Prospect | 766 |

Types: None
- None
- Easy Money
- Key Customer
- Partner
- ct
- ic

New Account Delete Account Create View Start Prev (1 to 11 of 11) Next Las

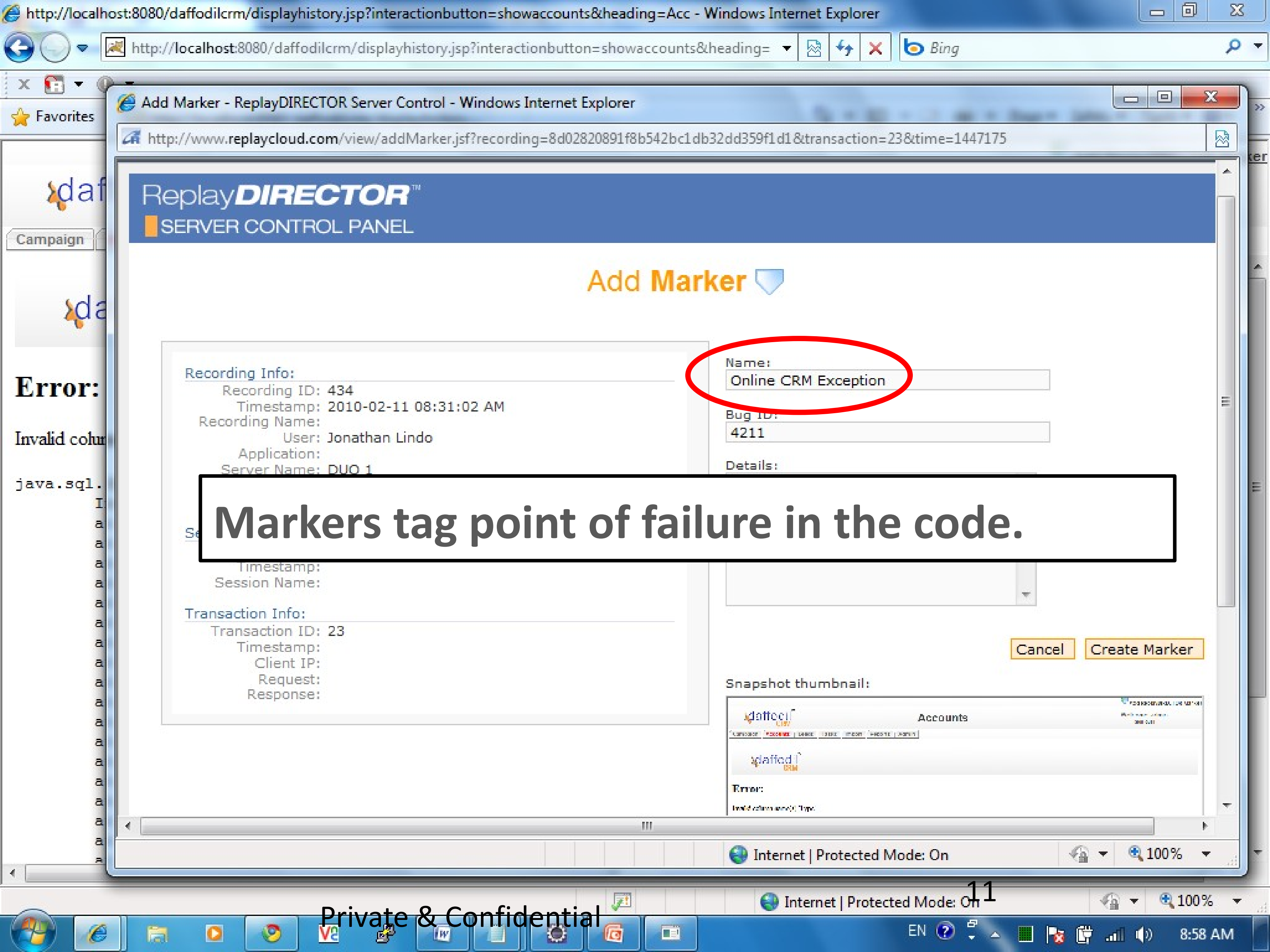

http://localhost:8080/daffodilcrm/displayhistory.jsp?interactionbutton=showaccounts&heading=Acc - Windows Internet Explorer
Bing
Favorites
Page
Safety
Tools
Add ReplayDIRECTOR Marker
daffodil CRM
Accounts
Welcome admin
[sign out ]
Campaign
Accounts
Leads
Tasks
Import
Reports
Admin
Done
Internet | Protected Mode: On
100%
EN
8:55 AM

**Recording has it captured!**

# Error:

Invalid column name(s) 'Type'.

```
java.sql.SQLException:
        Invalid column name(s) 'Type'.
        at com.daffodilwoods.database.resource.DException.getSqlException(Unknown Source)
        at in.co.daffodil.db.jdbc.DaffodilDBStatement.executeQuery(Unknown Source)
        at org.apache.jsp.AllAccounts_jsp._jspService(AllAccounts_jsp.java:416)
        at org.apache.jasper.runtime.HttpJspBase.service(HttpJspBase.java:98)
        at javax.servlet.http.HttpServlet.service(HttpServlet.java:803)
        at org.apache.jasper.servlet.JspServletWrapper.service(JspServletWrapper.java:328)
        at org.apache.jasper.servlet.JspServlet.serviceJspFile(JspServlet.java:315)
        at org.apache.jasper.servlet.JspServlet.service(JspServlet.java:265)
        at javax.servlet.http.HttpServlet.service(HttpServlet.java:803)
        at org.apache.catalina.core.ApplicationFilterChain.internalDoFilter(ApplicationFilterChain.java:269)
        at org.apache.catalina.core.ApplicationFilterChain.doFilter(ApplicationFilterChain.java:188)
        at com.replaysolutions.util.ReplayServlet.doFilter(ReplayServlet.java:69)
        at org.apache.catalina.core.ApplicationFilterChain.internalDoFilter(ApplicationFilterChain.java:215)
        at org.apache.catalina.core.ApplicationFilterChain.doFilter(ApplicationFilterChain.java:188)
        at org.apache.catalina.core.StandardWrapperValve.invoke(StandardWrapperValve.java:210)
        at org.apache.catalina.core.StandardContextValve.invoke(StandardContextValve.java:174)
        at org.apache.catalina.core.StandardHostValve.invoke(StandardHostValve.java:127)
        at org.apache.catalina.valves.ErrorReportValve.invoke(ErrorReportValve.java:117)
```


http://localhost:8080/daffodilcrm/displayhistory.jsp?interactionbutton=showaccounts&heading=Acc - Windows Internet Explorer
Favorites
Campaign
Error:
Invalid colu
java.sql.
Add Marker - ReplayDIRECTOR Server Control - Windows Internet Explorer
http://www.replaycloud.com/view/addMarker.jsf?recording=8d02820891f8b542bc1db32dd359f1d1&transaction=23&time=1447175
ReplayDIRECTOR™
SERVER CONTROL PANEL
Cancel
Create Marker
Snapshot thumbnail:
Accounts
Internet | Protected Mode: On
100%
EN
8:58 AM

## Add Marker

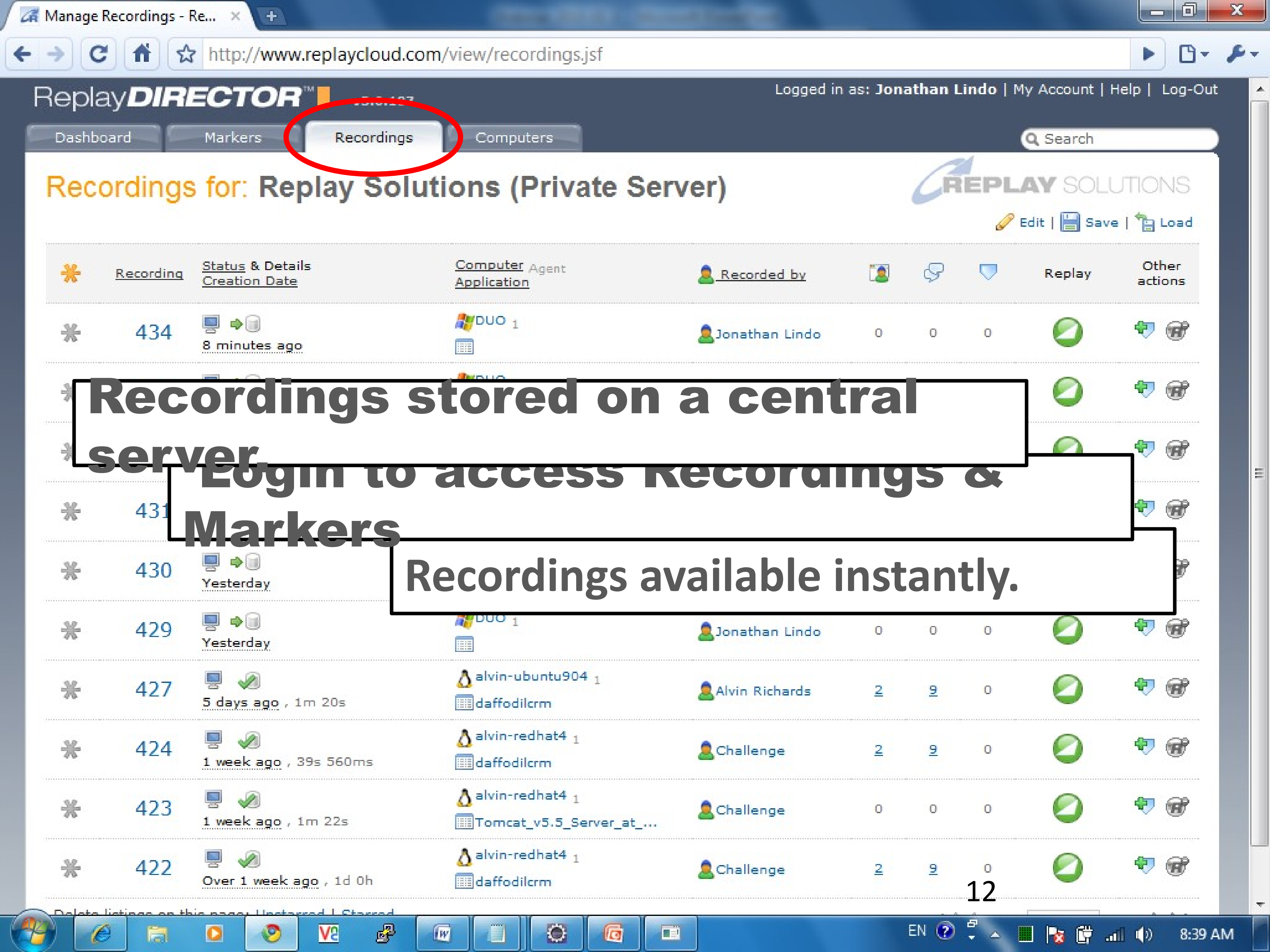
Recording Info:
Recording ID: 434
Timestamp: 2010-02-11 08:31:02 AM
Recording Name:
User: Jonathan Lindo
Application:
Server Name: DUO 1

Timestamp:
Session Name:

Transaction Info:
Transaction ID: 23
Timestamp:
Client IP:
Request:
Response:

Name: Online CRM Exception
Bug ID: 4211
Details:

**Markers tag point of failure in the code.**


Manage Recordings - Re...
http://www.replaycloud.com/view/recordings.jsf
ReplayDIRECTOR™
Logged in as: **Jonathan Lindo** | My Account | Help | Log-Out
Dashboard
Markers
Recordings
Computers
Search
REPLAY SOLUTIONS
Edit | Save | Load

Recordings for: **Replay Solutions (Private Server)**

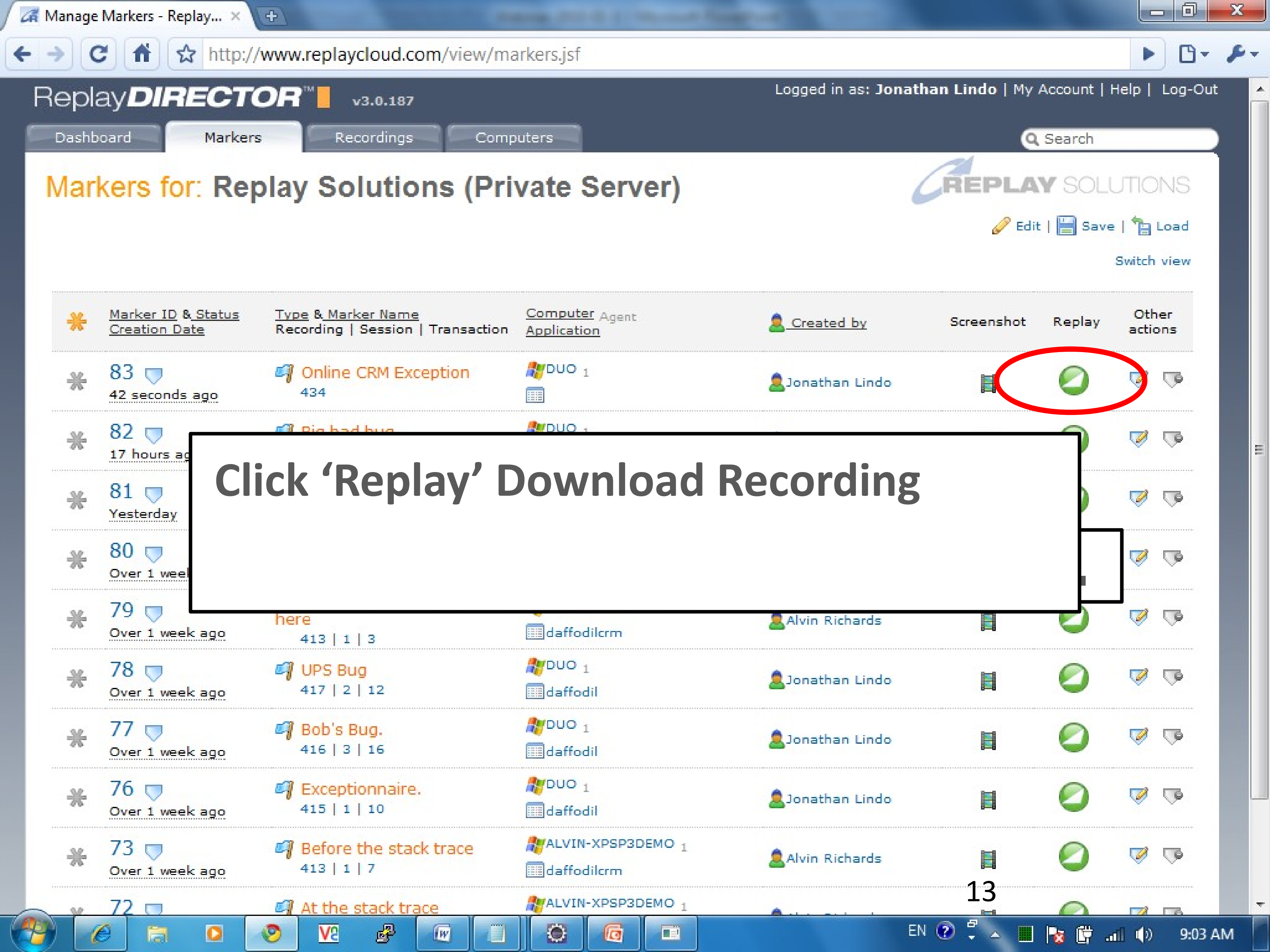
| | Recording | Status & Details<br>Creation Date | Computer Agent<br>Application | Recorded by | | | | Replay | Other actions |
|---|---|---|---|---|---|---|---|---|---|
| | 434 | 8 minutes ago | DUO 1 | Jonathan Lindo | 0 | 0 | 0 | | |
| | | | DUO | | | | | | |
| | | | | | | | | | |
| | 431 | | | | | | | | |
| | 430 | Yesterday | | | | | | | |
| | 429 | Yesterday | DUO 1 | Jonathan Lindo | 0 | 0 | 0 | | |
| | 427 | 5 days ago , 1m 20s | alvin-ubuntu904 1<br>daffodilcrm | Alvin Richards | 2 | 9 | 0 | | |
| | 424 | 1 week ago , 39s 560ms | alvin-redhat4 1<br>daffodilcrm | Challenge | 2 | 9 | 0 | | |
| | 423 | 1 week ago , 1m 22s | alvin-redhat4 1<br>Tomcat_v5.5_Server_at_... | Challenge | 0 | 0 | 0 | | |
| | 422 | Over 1 week ago , 1d 0h | alvin-redhat4 1<br>daffodilcrm | Challenge | 2 | 9 | 0 | | |

Delete listings on this page: Unstarred | Starred

**Recordings stored on a central server**

**Login to access Recordings & Markers**

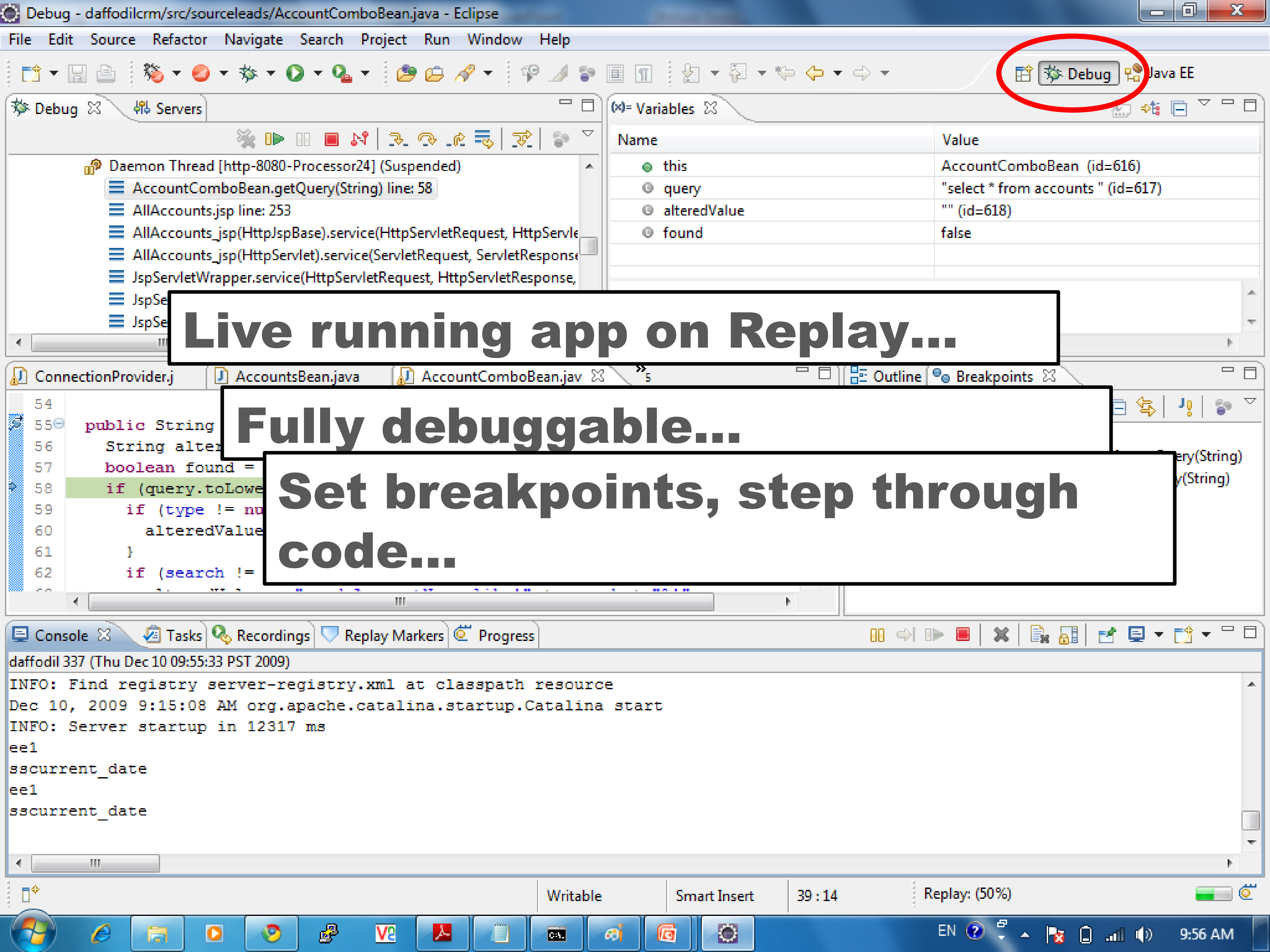
**Recordings available instantly.**


Manage Markers - Replay...
http://www.replaycloud.com/view/markers.jsf
ReplayDIRECTOR™ v3.0.187
Logged in as: Jonathan Lindo | My Account | Help | Log-Out
Dashboard
Markers
Recordings
Computers
Search
REPLAY SOLUTIONS
Edit | Save | Load
Switch view
EN
9:03 AM

Markers for: Replay Solutions (Private Server)

| Marker ID & Status<br>Creation Date | Type & Marker Name<br>Recording \| Session \| Transaction | Computer Agent<br>Application | Created by | Screenshot | Replay | Other actions |
|---|---|---|---|---|---|---|
| 83<br>42 seconds ago | Online CRM Exception<br>434 | DUO 1 | Jonathan Lindo | | | |
| 82<br>17 hours ag | Big bad bug | DUO 1 | | | | |
| 81<br>Yesterday | | | | | | |
| 80<br>Over 1 weel | | | | | | |
| 79<br>Over 1 week ago | here<br>413 \| 1 \| 3 | daffodilcrm | Alvin Richards | | | |
| 78<br>Over 1 week ago | UPS Bug<br>417 \| 2 \| 12 | DUO 1<br>daffodil | Jonathan Lindo | | | |
| 77<br>Over 1 week ago | Bob's Bug.<br>416 \| 3 \| 16 | DUO 1<br>daffodil | Jonathan Lindo | | | |
| 76<br>Over 1 week ago | Exceptionnaire.<br>415 \| 1 \| 10 | DUO 1<br>daffodil | Jonathan Lindo | | | |
| 73<br>Over 1 week ago | Before the stack trace<br>413 \| 1 \| 7 | ALVIN-XPSP3DEMO 1<br>daffodilcrm | Alvin Richards | | | |
| 72 | At the stack trace | ALVIN-XPSP3DEMO 1 | | | | |

# Click ‘Replay’ Download Recording


Debug - daffodilcrm/src/sourceleads/AccountComboBean.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Debug
Java EE
Debug
Servers
Variables
ConnectionProvider.j
AccountsBean.java
AccountComboBean.jav
Outline
Breakpoints
ery(String)
y(String)
Console
Tasks
Recordings
Replay Markers
Progress
Writable
Smart Insert
39 : 14
Replay: (50%)
EN
9:56 AM

**Live running app on Replay…**

**Fully debuggable…**

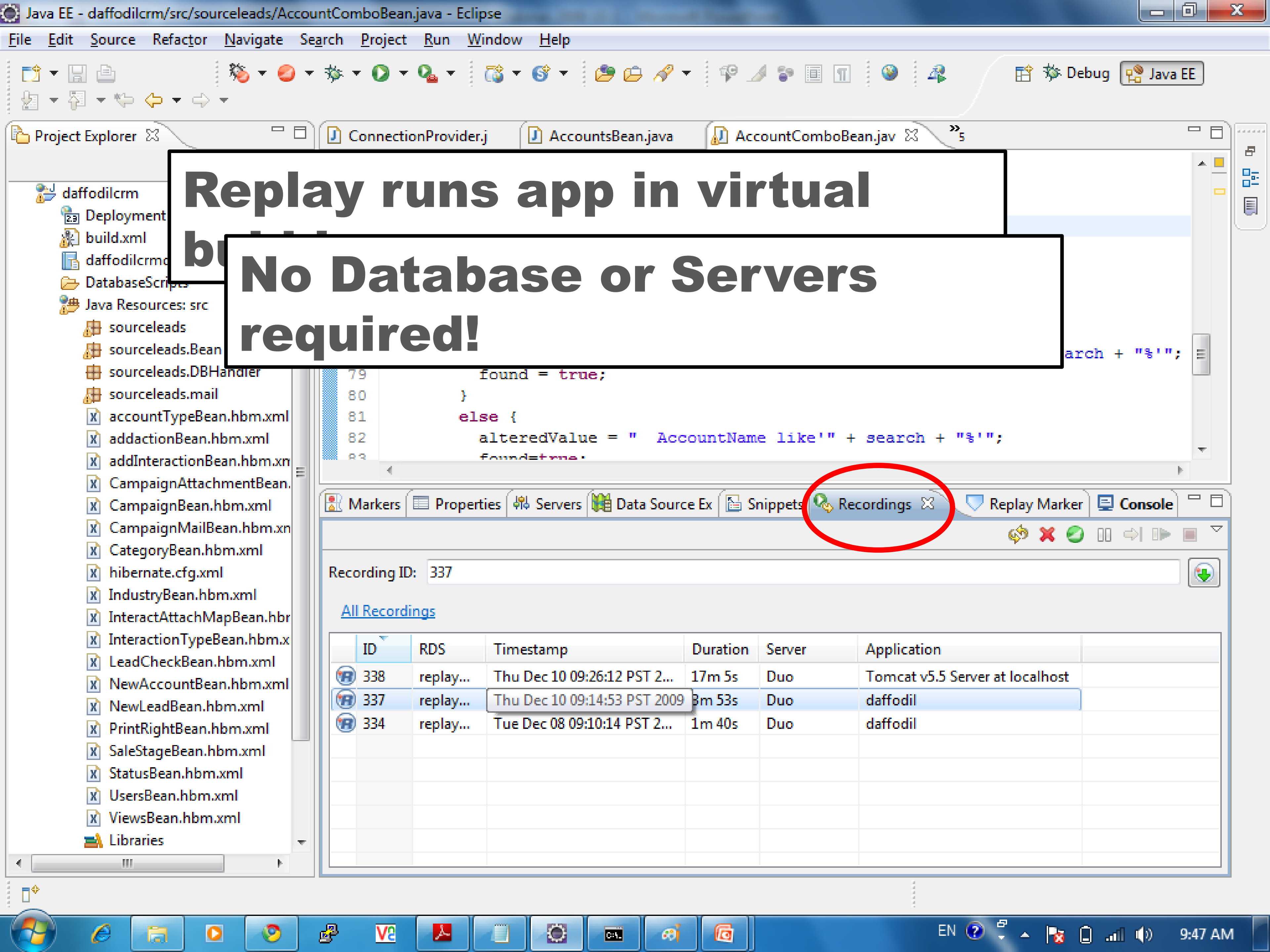
**Set breakpoints, step through code…**

Daemon Thread [http-8080-Processor24] (Suspended)
- AccountComboBean.getQuery(String) line: 58
- AllAccounts.jsp line: 253
- AllAccounts_jsp(HttpJspBase).service(HttpServletRequest, HttpServle
- AllAccounts_jsp(HttpServlet).service(ServletRequest, ServletResponse
- JspServletWrapper.service(HttpServletRequest, HttpServletResponse,
- JspSe
- JspSe

| Name | Value |
|---|---|
| this | AccountComboBean (id=616) |
| query | "select * from accounts " (id=617) |
| alteredValue | "" (id=618) |
| found | false |

```
public String
  String alter
  boolean found =
  if (query.toLowe
    if (type != nu
      alteredValue
    }
    if (search !=
```

```
daffodil 337 (Thu Dec 10 09:55:33 PST 2009)
INFO: Find registry server-registry.xml at classpath resource
Dec 10, 2009 9:15:08 AM org.apache.catalina.startup.Catalina start
INFO: Server startup in 12317 ms
ee1
sscurrent_date
ee1
sscurrent_date
```



**Replay runs app in virtual bu**

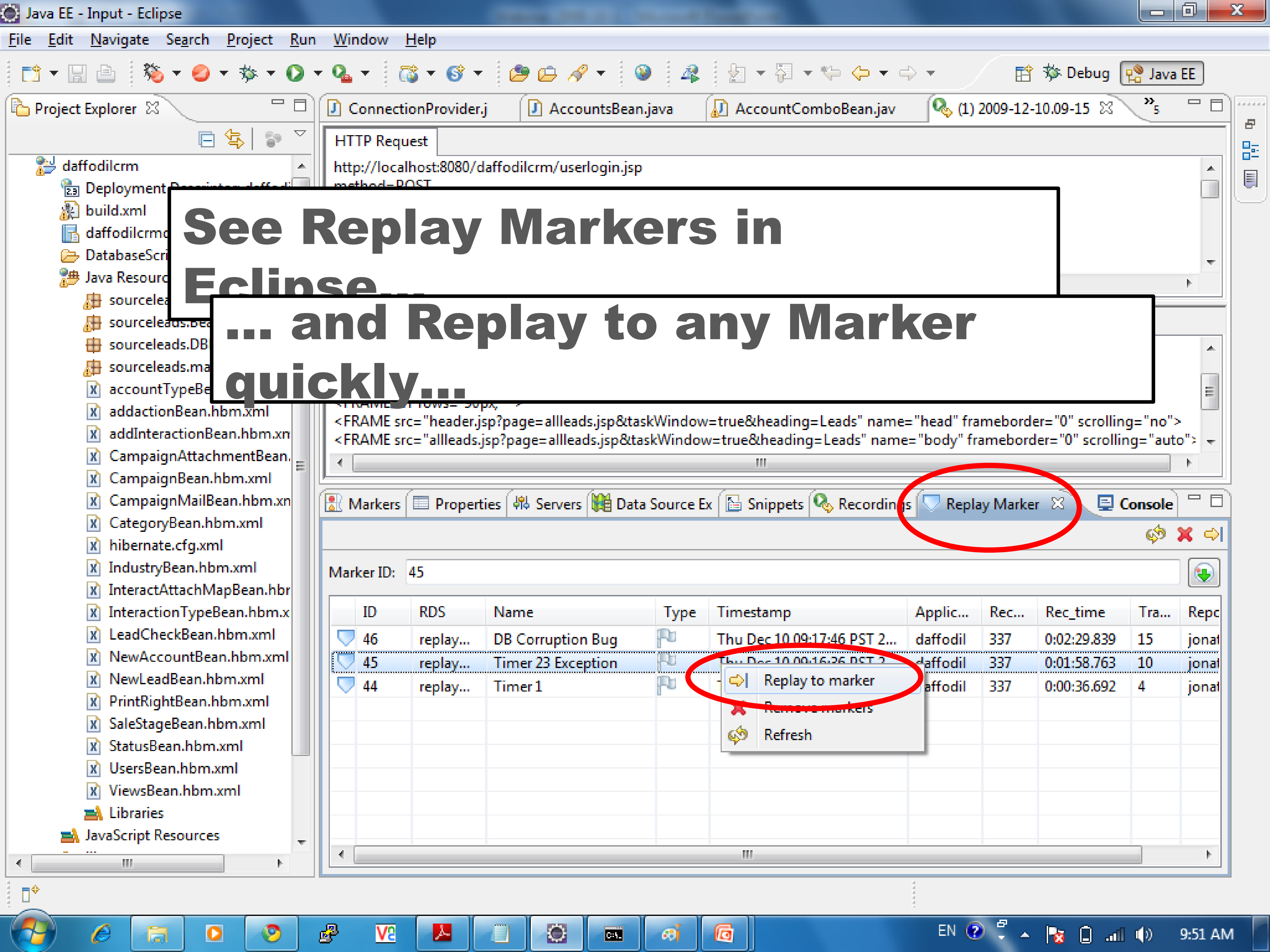
**No Database or Servers required!**

Java EE - daffodilcrm/src/sourceleads/AccountComboBean.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Debug
Java EE
Project Explorer
ConnectionProvider.j
AccountsBean.java
AccountComboBean.jav
daffodilcrm
Deployment
build.xml
daffodilcrm
DatabaseScripts
Java Resources: src
sourceleads
sourceleads.Bean
sourceleads.DBHandler
sourceleads.mail
accountTypeBean.hbm.xml
addactionBean.hbm.xml
addInteractionBean.hbm.xn
CampaignAttachmentBean.
CampaignBean.hbm.xml
CampaignMailBean.hbm.xn
CategoryBean.hbm.xml
hibernate.cfg.xml
IndustryBean.hbm.xml
InteractAttachMapBean.hbr
InteractionTypeBean.hbm.x
LeadCheckBean.hbm.xml
NewAccountBean.hbm.xml
NewLeadBean.hbm.xml
PrintRightBean.hbm.xml
SaleStageBean.hbm.xml
StatusBean.hbm.xml
UsersBean.hbm.xml
ViewsBean.hbm.xml
Libraries
Markers
Properties
Servers
Data Source Ex
Snippets
Recordings
Replay Marker
Console
All Recordings
EN
9:47 AM

```
arch + "%'";
            found = true;
          }
          else {
            alteredValue = "  AccountName like'" + search + "%'";
            found=true;
```

Recording ID: 337

| ID | RDS | Timestamp | Duration | Server | Application |
|---|---|---|---|---|---|
| 338 | replay... | Thu Dec 10 09:26:12 PST 2... | 17m 5s | Duo | Tomcat v5.5 Server at localhost |
| 337 | replay... | Thu Dec 10 09:14:53 PST 2009 | 3m 53s | Duo | daffodil |
| 334 | replay... | Tue Dec 08 09:10:14 PST 2... | 1m 40s | Duo | daffodil |


Java EE - Input - Eclipse
File Edit Navigate Search Project Run Window Help
Debug
Java EE
Project Explorer
daffodilcrm
Deployment
build.xml
daffodilcrm
DatabaseScri
Java Resour
sourcelea
sourceleads.bea
sourceleads.DB
sourceleads.ma
accountTypeBe
addactionBean.hbm.xml
addInteractionBean.hbm.xn
CampaignAttachmentBean.
CampaignBean.hbm.xml
CampaignMailBean.hbm.xn
CategoryBean.hbm.xml
hibernate.cfg.xml
IndustryBean.hbm.xml
InteractAttachMapBean.hbr
InteractionTypeBean.hbm.x
LeadCheckBean.hbm.xml
NewAccountBean.hbm.xml
NewLeadBean.hbm.xml
PrintRightBean.hbm.xml
SaleStageBean.hbm.xml
StatusBean.hbm.xml
UsersBean.hbm.xml
ViewsBean.hbm.xml
Libraries
JavaScript Resources
ConnectionProvider.j
AccountsBean.java
AccountComboBean.jav
(1) 2009-12-10.09-15
HTTP Request
Markers
Properties
Servers
Data Source Ex
Snippets
Recordings
Replay Marker
Console
Replay to marker
Remove markers
Refresh
EN
9:51 AM

## See Replay Markers in Eclipse...

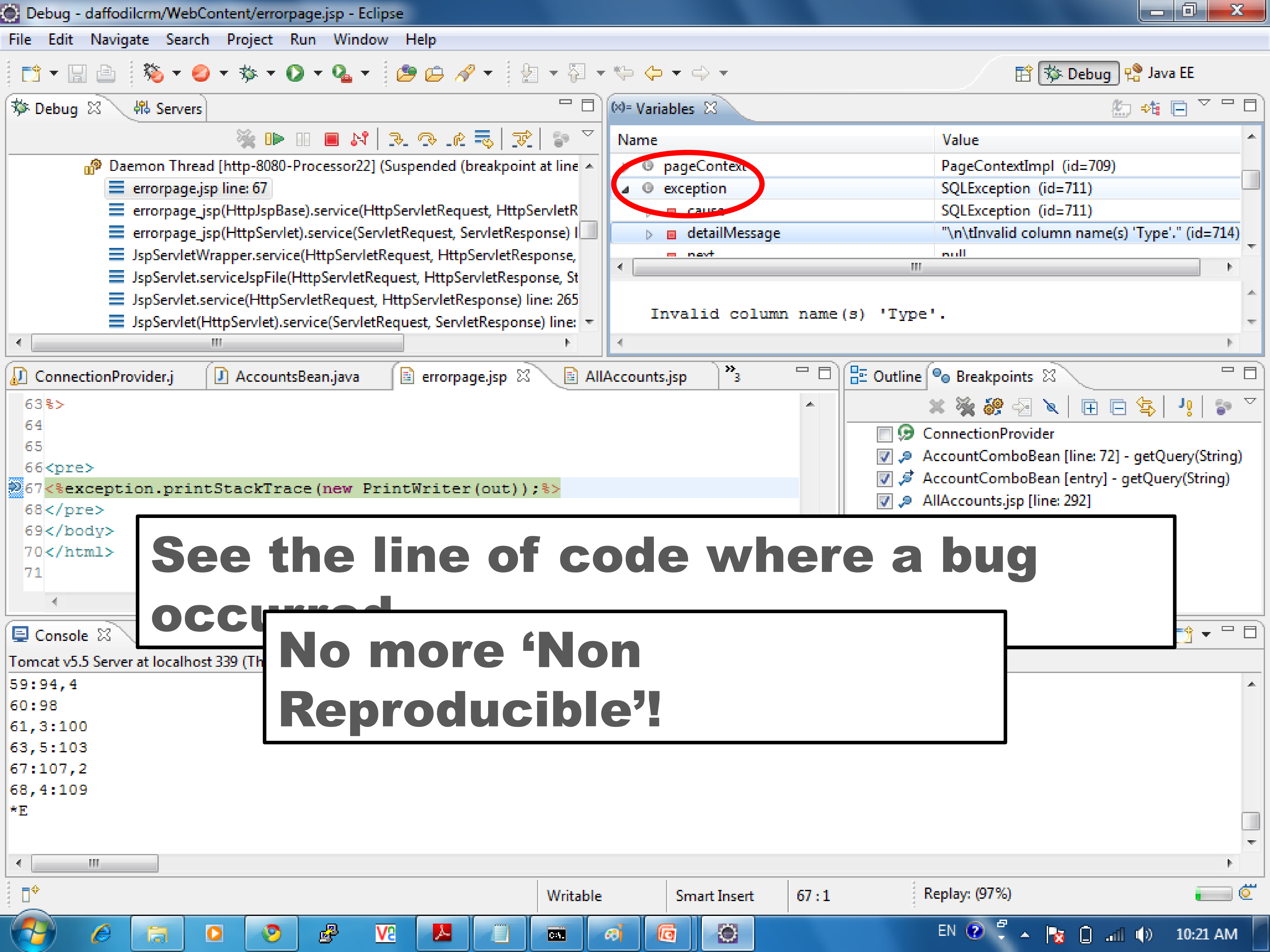
## ... and Replay to any Marker quickly...

```
http://localhost:8080/daffodilcrm/userlogin.jsp
method=POST
```

```
<FRAME src="header.jsp?page=allleads.jsp&taskWindow=true&heading=Leads" name="head" frameborder="0" scrolling="no">
<FRAME src="allleads.jsp?page=allleads.jsp&taskWindow=true&heading=Leads" name="body" frameborder="0" scrolling="auto">
```

Marker ID: 45

| ID | RDS | Name | Type | Timestamp | Applic... | Rec... | Rec_time | Tra... | Repc |
|---|---|---|---|---|---|---|---|---|---|
| 46 | replay... | DB Corruption Bug | | Thu Dec 10 09:17:46 PST 2... | daffodil | 337 | 0:02:29.839 | 15 | jonat |
| 45 | replay... | Timer 23 Exception | | Thu Dec 10 09:16:36 PST 2 | daffodil | 337 | 0:01:58.763 | 10 | jonat |
| 44 | replay... | Timer 1 | | | affodil | 337 | 0:00:36.692 | 4 | jonat |


Debug - daffodilcrm/WebContent/errorpage.jsp - Eclipse
File Edit Navigate Search Project Run Window Help
Debug
Java EE
Debug
Servers
Variables
Name
Value
ConnectionProvider.j
AccountsBean.java
errorpage.jsp
AllAccounts.jsp
Outline
Breakpoints
Console
Writable
Smart Insert
67 : 1
Replay: (97%)
EN
10:21 AM

```
Daemon Thread [http-8080-Processor22] (Suspended (breakpoint at line
    errorpage.jsp line: 67
    errorpage_jsp(HttpJspBase).service(HttpServletRequest, HttpServletR
    errorpage_jsp(HttpServlet).service(ServletRequest, ServletResponse) l
    JspServletWrapper.service(HttpServletRequest, HttpServletResponse,
    JspServlet.serviceJspFile(HttpServletRequest, HttpServletResponse, St
    JspServlet.service(HttpServletRequest, HttpServletResponse) line: 265
    JspServlet(HttpServlet).service(ServletRequest, ServletResponse) line:
```

| Name | Value |
|---|---|
| pageContext | PageContextImpl (id=709) |
| exception | SQLException (id=711) |
| cause | SQLException (id=711) |
| detailMessage | "\n\tInvalid column name(s) 'Type'." (id=714) |
| next | null |

```
Invalid column name(s) 'Type'.
```

```
%>



<pre>
<%exception.printStackTrace(new PrintWriter(out));%>
</pre>
</body>
</html>
```

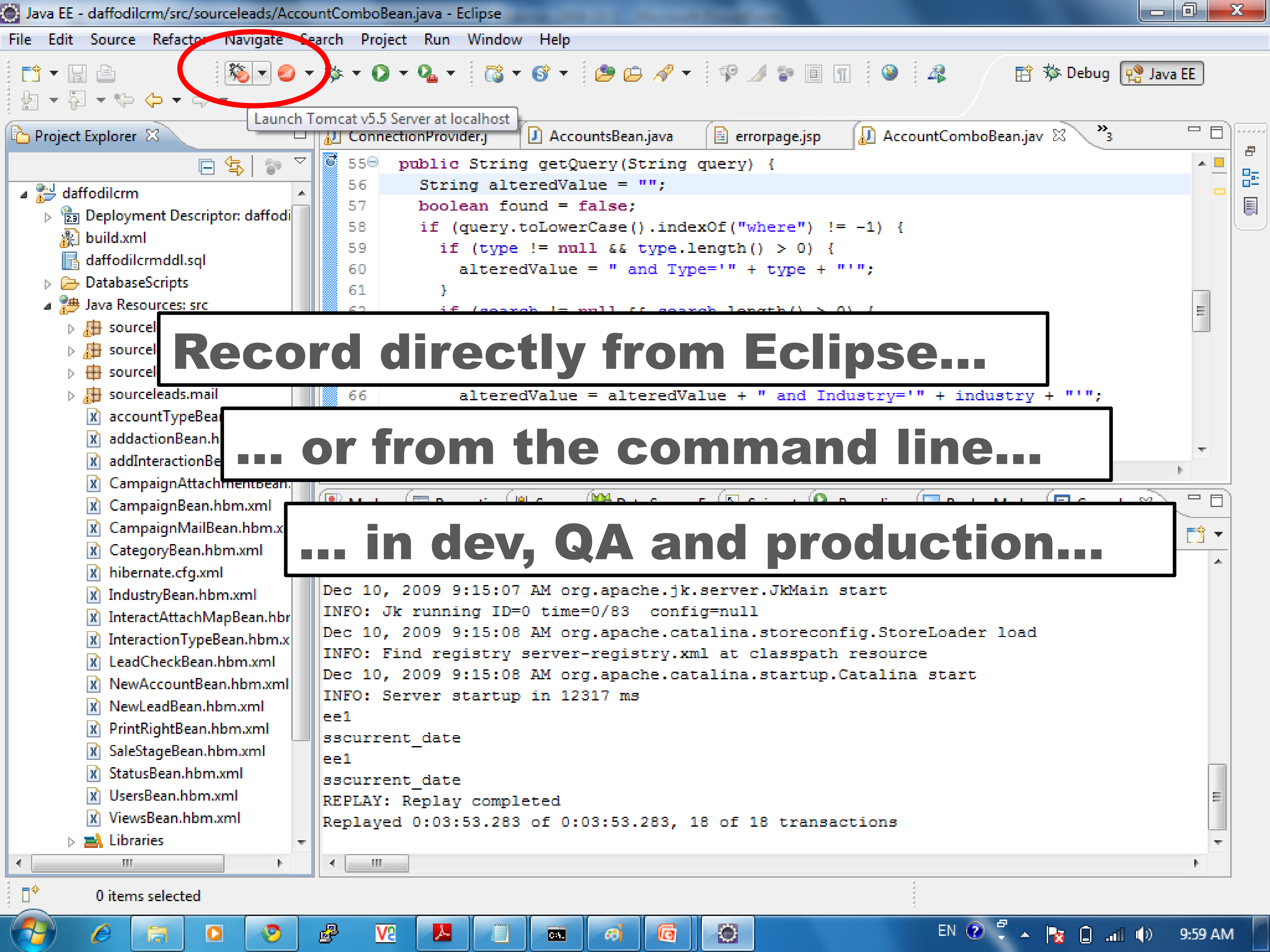
- ☐ ConnectionProvider
- ☑ AccountComboBean [line: 72] - getQuery(String)
- ☑ AccountComboBean [entry] - getQuery(String)
- ☑ AllAccounts.jsp [line: 292]

Tomcat v5.5 Server at localhost 339 (Th

```
59:94,4
60:98
61,3:100
63,5:103
67:107,2
68,4:109
*E
```

**See the line of code where a bug occurred**

**No more 'Non Reproducible'!**


Java EE - daffodilcrm/src/sourceleads/AccountComboBean.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Debug
Java EE
Launch Tomcat v5.5 Server at localhost
Project Explorer
ConnectionProvider.j
AccountsBean.java
errorpage.jsp
AccountComboBean.jav
daffodilcrm
Deployment Descriptor: daffodi
build.xml
daffodilcrmddl.sql
DatabaseScripts
Java Resources: src
sourcel
sourcel
sourcel
sourceleads.mail
accountTypeBea
addactionBean.h
addInteractionBe
CampaignAttachmentBean.
CampaignBean.hbm.xml
CampaignMailBean.hbm.x
CategoryBean.hbm.xml
hibernate.cfg.xml
IndustryBean.hbm.xml
InteractAttachMapBean.hbr
InteractionTypeBean.hbm.x
LeadCheckBean.hbm.xml
NewAccountBean.hbm.xml
NewLeadBean.hbm.xml
PrintRightBean.hbm.xml
SaleStageBean.hbm.xml
StatusBean.hbm.xml
UsersBean.hbm.xml
ViewsBean.hbm.xml
Libraries
0 items selected
EN
9:59 AM

**Record directly from Eclipse…**

**… or from the command line…**

**… in dev, QA and production…**

```
public String getQuery(String query) {
  String alteredValue = "";
  boolean found = false;
  if (query.toLowerCase().indexOf("where") != -1) {
    if (type != null && type.length() > 0) {
      alteredValue = " and Type='" + type + "'";
    }
```

```
      alteredValue = alteredValue + " and Industry='" + industry + "'";
```

```
Dec 10, 2009 9:15:07 AM org.apache.jk.server.JkMain start
INFO: Jk running ID=0 time=0/83  config=null
Dec 10, 2009 9:15:08 AM org.apache.catalina.storeconfig.StoreLoader load
INFO: Find registry server-registry.xml at classpath resource
Dec 10, 2009 9:15:08 AM org.apache.catalina.startup.Catalina start
INFO: Server startup in 12317 ms
ee1
sscurrent_date
ee1
sscurrent_date
REPLAY: Replay completed
Replayed 0:03:53.283 of 0:03:53.283, 18 of 18 transactions
```

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