

Tivoli Directory Integrator (TDI)

The Best Free Tool You've Never Heard Of (The Developer's Perspective)

Marie Scott

Thomas "Duffbert" Duff

The Consultant In Your Pocket Series



Agenda

- Introduction to TDI architecture/concepts
- Discuss TDI entitlement
- Install TDI
- Example – Import CSV data into a Notes database
- Example – Export Notes database data as XML
- Resources



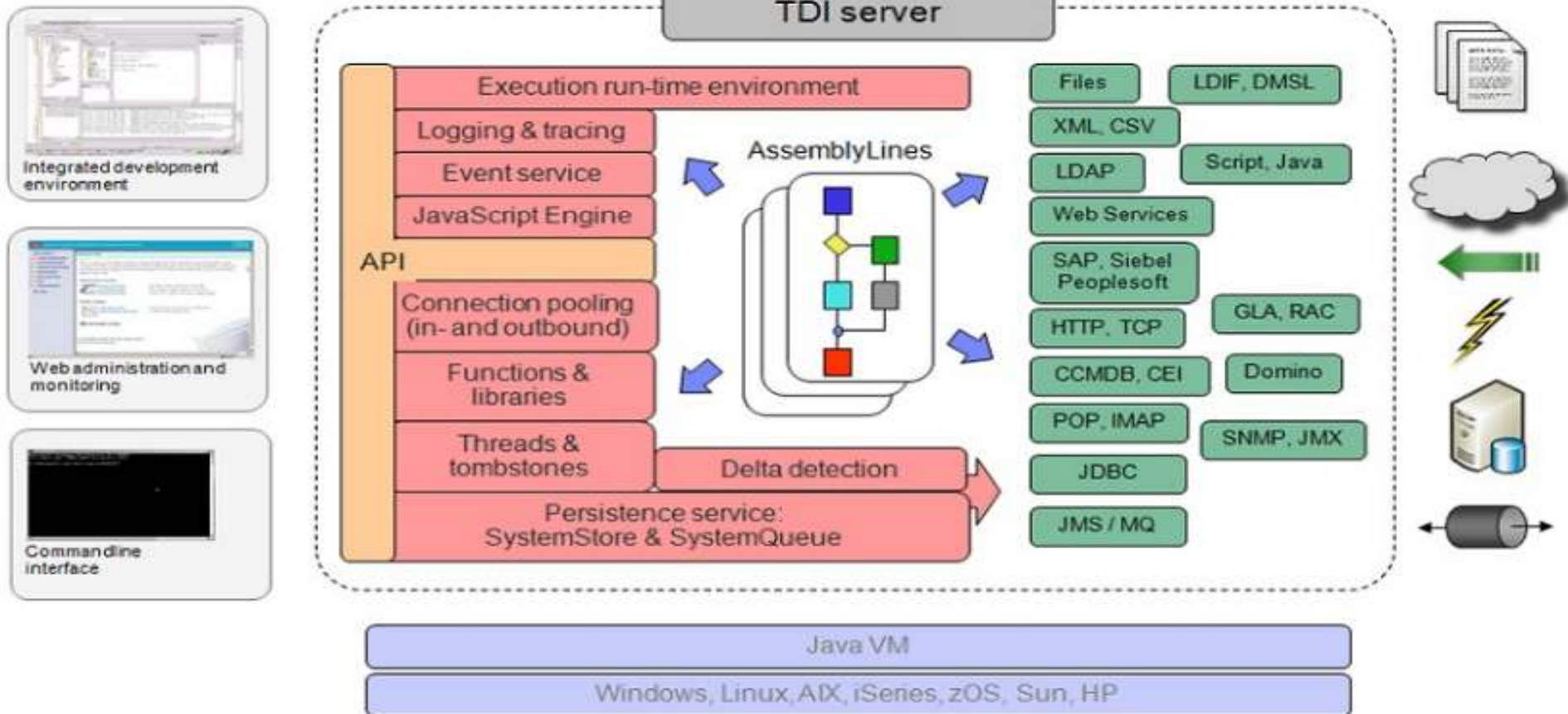
IBM Tivoli® Directory Integrator®:

“Tivoli Directory Integrator (TDI) is a graphical integration toolkit for accessing and detecting changes in practically any type of system, data store, protocol, or API. It also lets you transform, filter, and validate this data before driving it to the output targets of your choosing.”

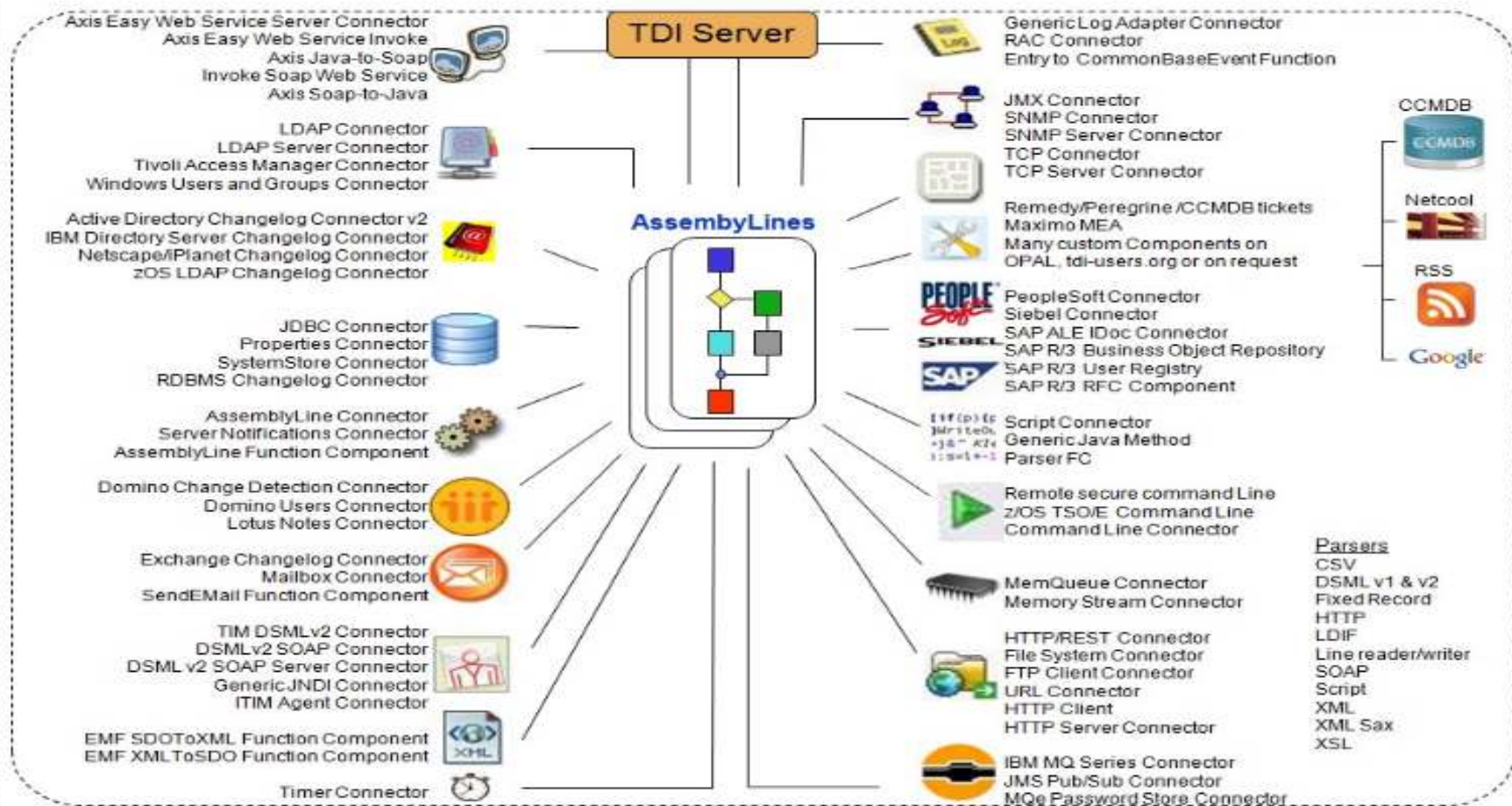
Source: Redpaper IBM Lotus Domino Integration Using IBM Tivoli Directory Integrator

- **Use for migration**
- **Use for integration**
- **Use for synchronization**

TDI Architecture



What Will TDI Connect To?





TDI Definitions/Concepts (Part 1)

- An **AssemblyLine**, just like a factory assembly line, is what TDI uses to identify, move, transform, push, pull or synch data between various **Data Sources**. TDI can run any number of these AssemblyLines at any given time. These AssemblyLines are what the developers and administrators of TDI will put together to accomplish their data needs.
- A **Data Source** is the data system or group of data objects that you are going to connect via the AssemblyLine. And a **Connector** acts as your means of setting up a logical connection to the **Data Source**.

TDI Definitions/Concepts (Part 2)

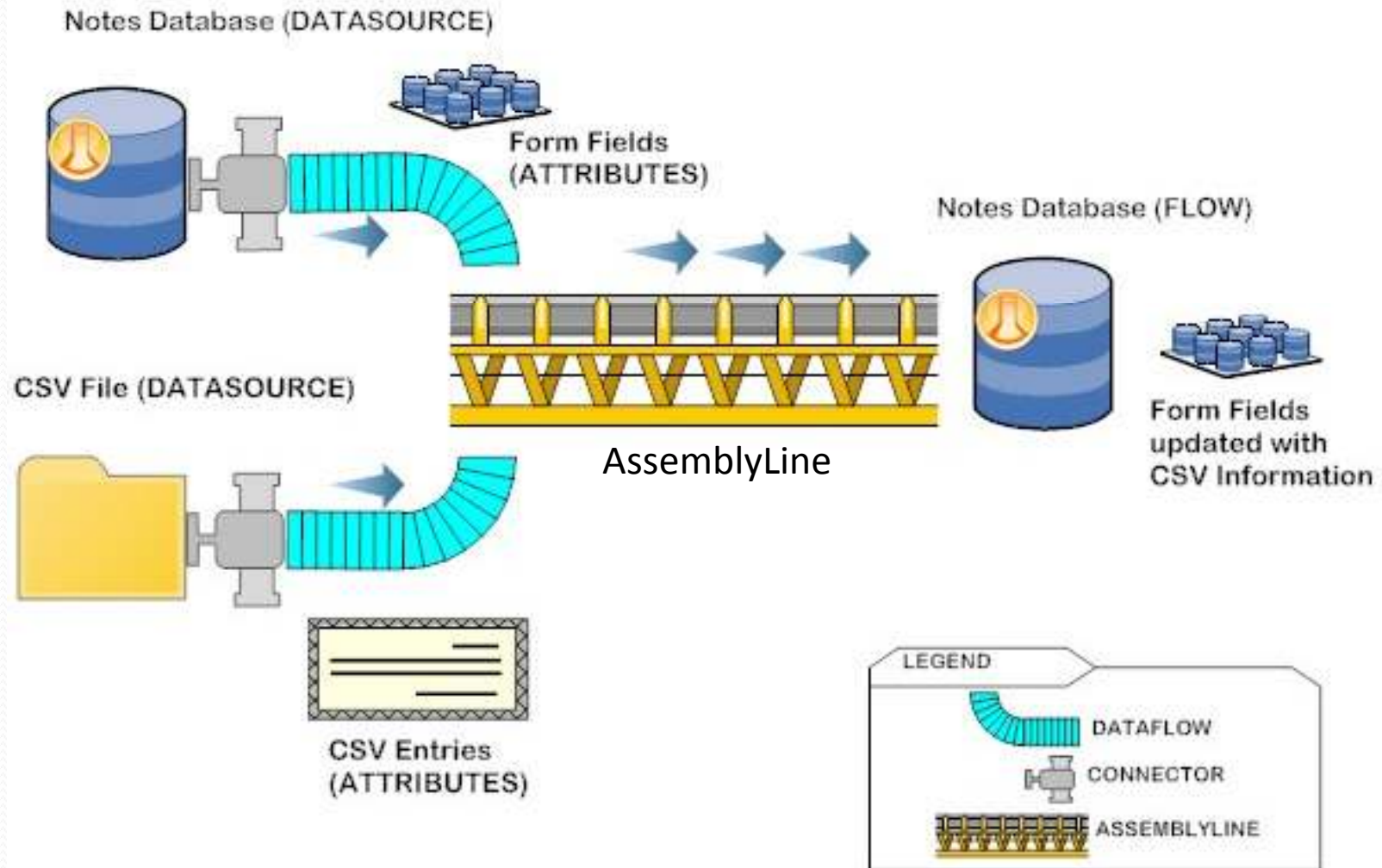
- **Connectors** use authenticated processes like LDAP, DIIOP, JDBC, AD, etc., that provide dialog boxes for configuring exactly how the **Data Source** will be accessed. These are batch or event-driven processes that handle the identification, routing, and transformation of data between data sources.
- Within the **Data Source** are **Entries**.
 - **Entries** are the “data buckets” - these are the data objects.
 - Each entry may have **Attributes** – or sub parts.
- **Attributes** describe and or contain the data values from the various data sources that you’re linking together in the AssemblyLine. **Values** are the objects that contain the actual data values that are being stored and transported through the AssemblyLine.
- **Entries** contain **Attributes** and **Attributes** contain **Values**

TDI Definitions/Concepts (Part 3)

- **Work Entry** – entry that is being manipulated in the AssemblyLine
- **Conn Entry** – entry that is the local work store for each Connector
- **Attribute Map** – links the data movement between the Conn Entry and Work Entry for each Connector.

TDI AssemblyLine Overview

TIVOLI DIRECTORY INTEGRATOR: CSV FILE/NOTES DATABASE OVERVIEW DIAGRAM





TDI Entitlement – “It’s free!”

- Domino license holders are entitled to TDI
- Check your IBM Passport Advantage download site
- Remember to visit IBM Fix Central for TDI Fixpack downloads.
- AssemblyLine should include Domino as a data source
- For additional information go to:
 - <http://www-01.ibm.com/software/lotus/notesanddomino/additionalswentitlements.html>

Finding TDI on the IBM Passport Advantage Site

Download options

You will see downloads for the most current version. In addition:

If available, would you like to see previous versions of this product?

Yes No

If available, would you like to see associated products included at no additional charge?

Yes No

Select optional downloads, if desired

Additional software, which you may or may not require, is bundled with your main product (at no additional charge) and is available for downloading. Refer to the license agreements for specifics.

Associated products included at no additional charge

<input type="checkbox"/>	<input checked="" type="checkbox"/>	IBM Tivoli Directory Integrator 6.1.1 for Domino 8.0.x Multiplatform Multilingual eAssembly(CR5TQML)	
		Size	6 files (2490mb)
		Date posted	17-Aug-2007
		<input type="checkbox"/> Multi-product package terms	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	IBM Tivoli Directory Integrator 7.0 for Lotus Domino 8.5.x Multiplatform Multilingual eAssembly(CR9ZVML)	
		Size	8 files (3388mb)
		Date posted	12-Oct-2009

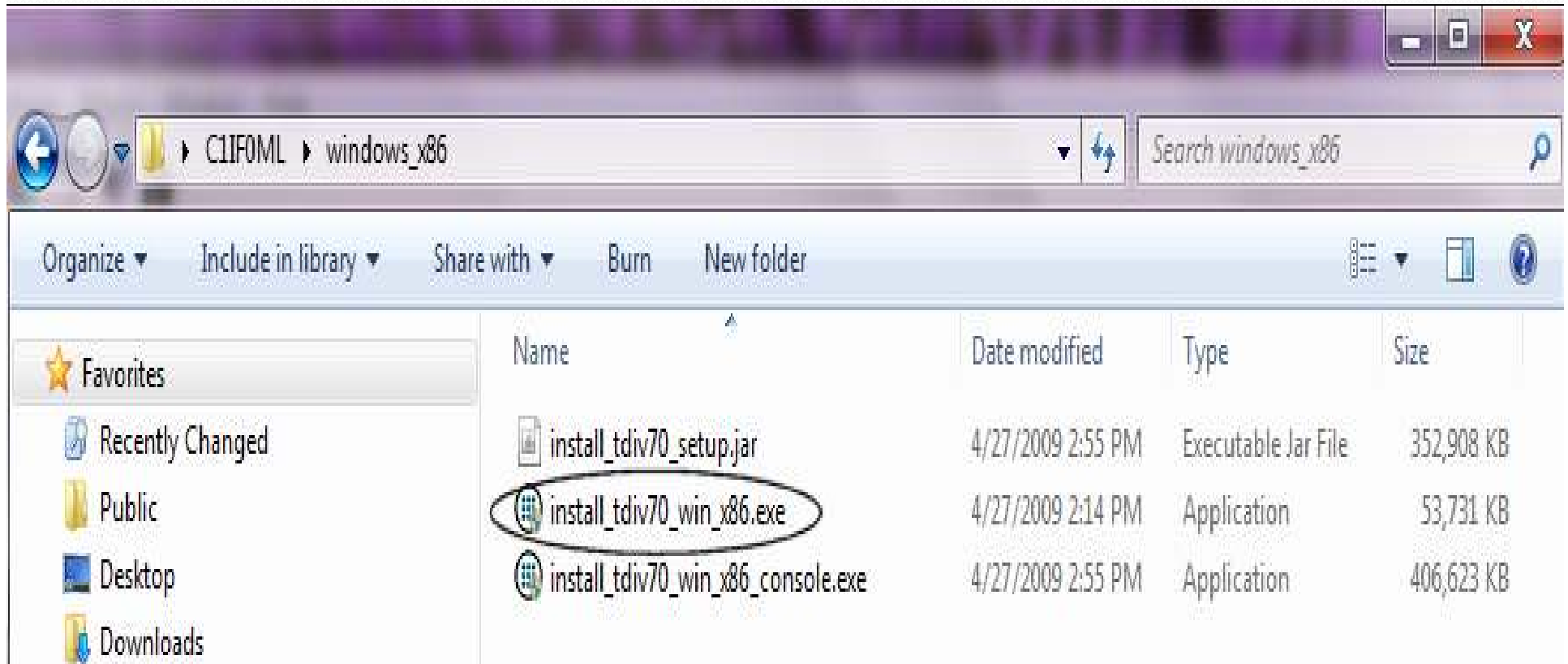
1. Select your Domino software type
2. Next screen – be sure to select the Download options – “If available would you like to see associated products included at no additional charge.”
3. Expand the “Associated products included at no additional charge” selection
4. Choose the version of TDI you’d like to download



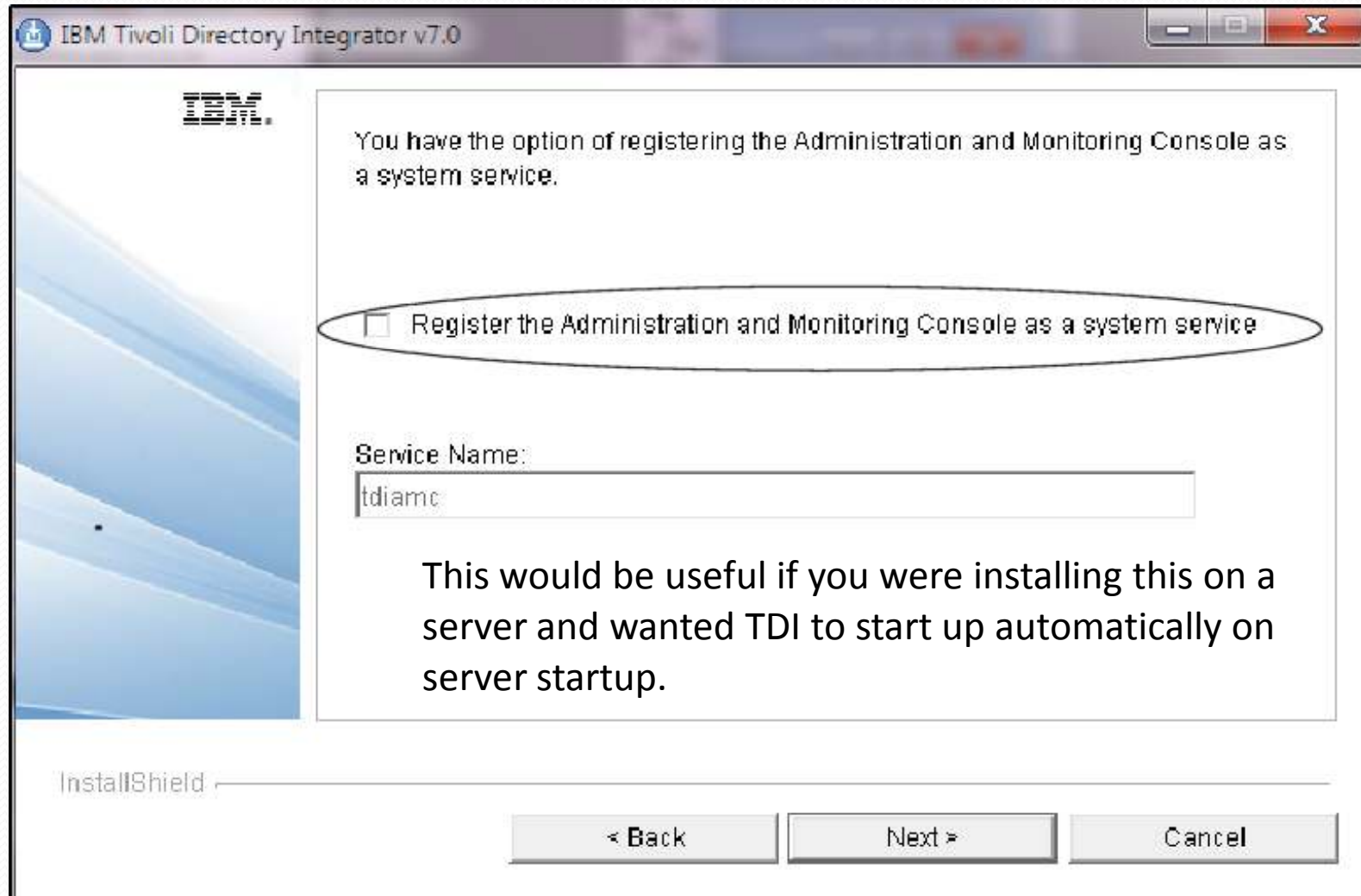
Installing TDI

- TDI 7.0 and 6.1 currently supported versions
- We're going to cover 7.0 in our slides
- Let's get started!

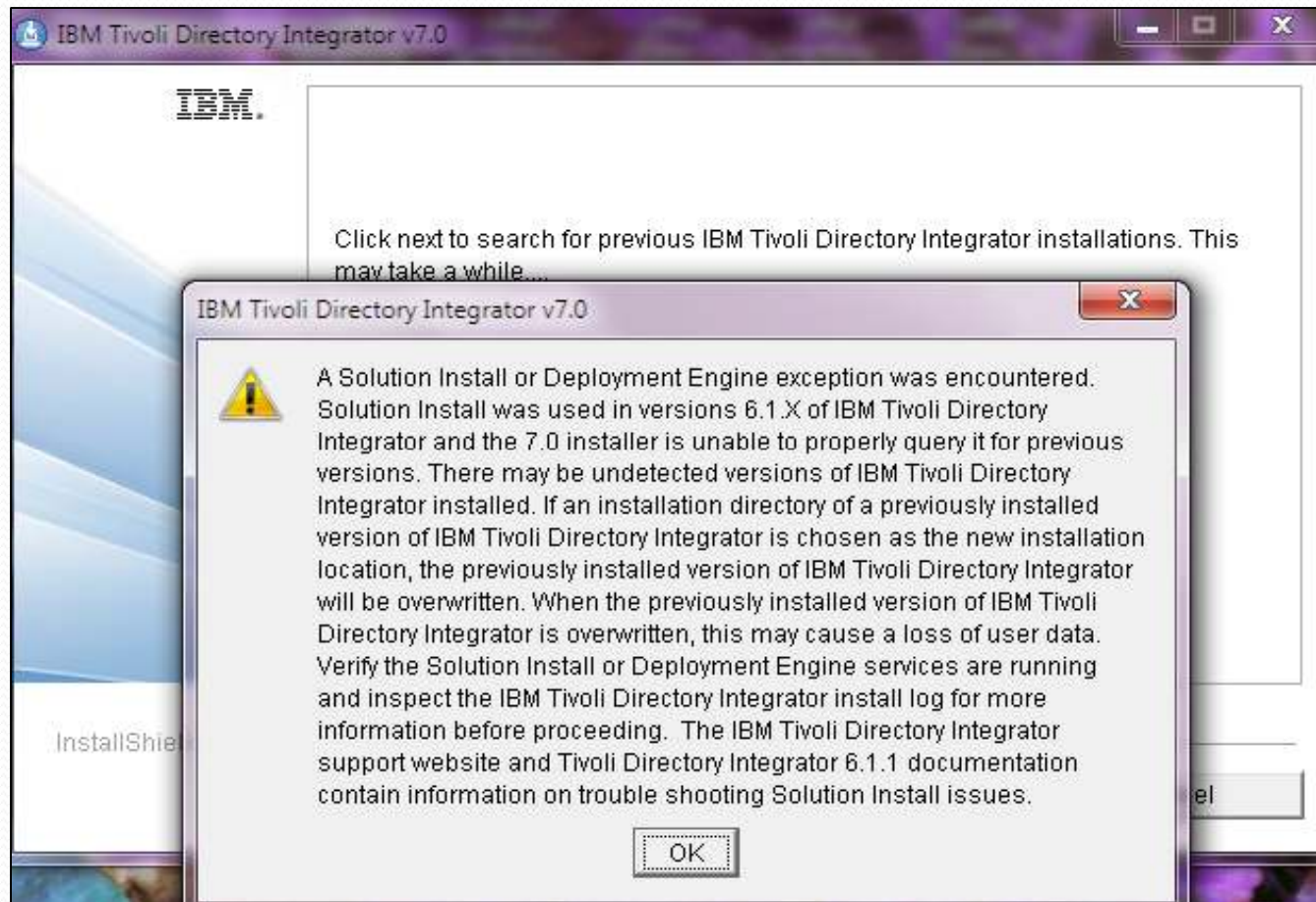
Use the `install_tdiv70_win_x86.exe` instead of `launchpad.exe`... It works better



If you want to have console start at bootup...

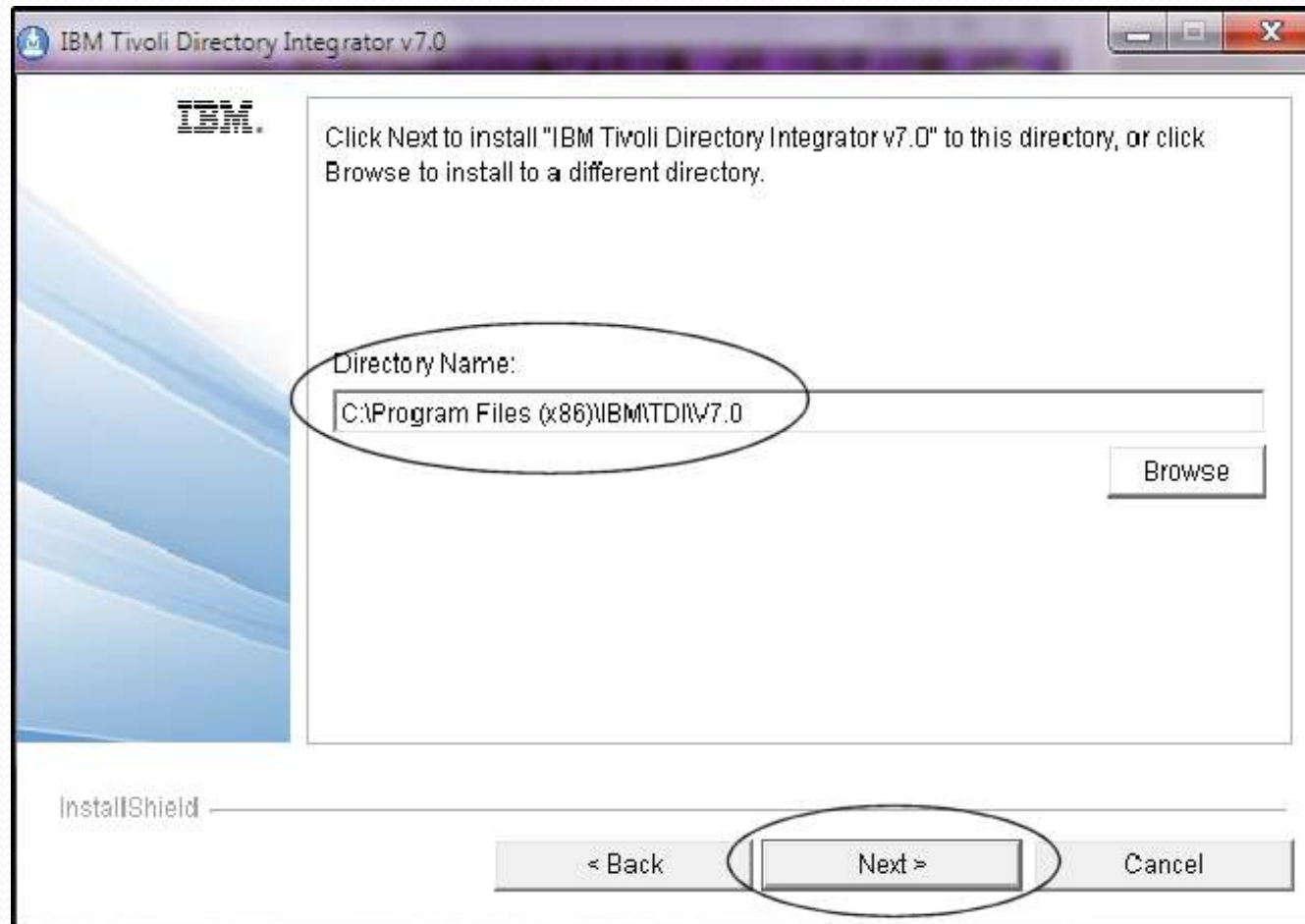


You might see this if TDI was previously installed...



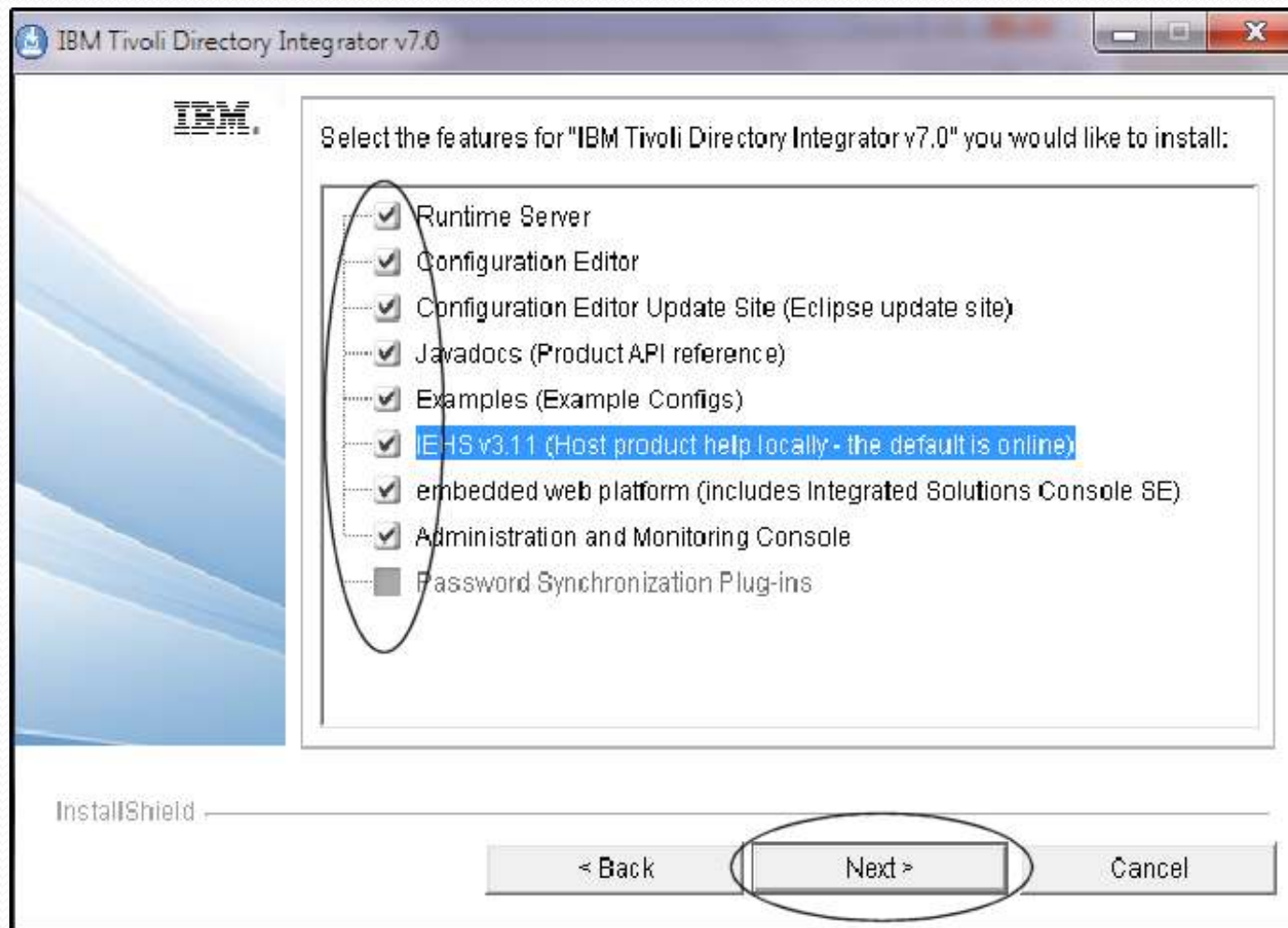
This seems to be quite common on install, even when I think I have everything “cleaned up”. So long as you're not upgrading, you can ignore it.

Choose your install directory...



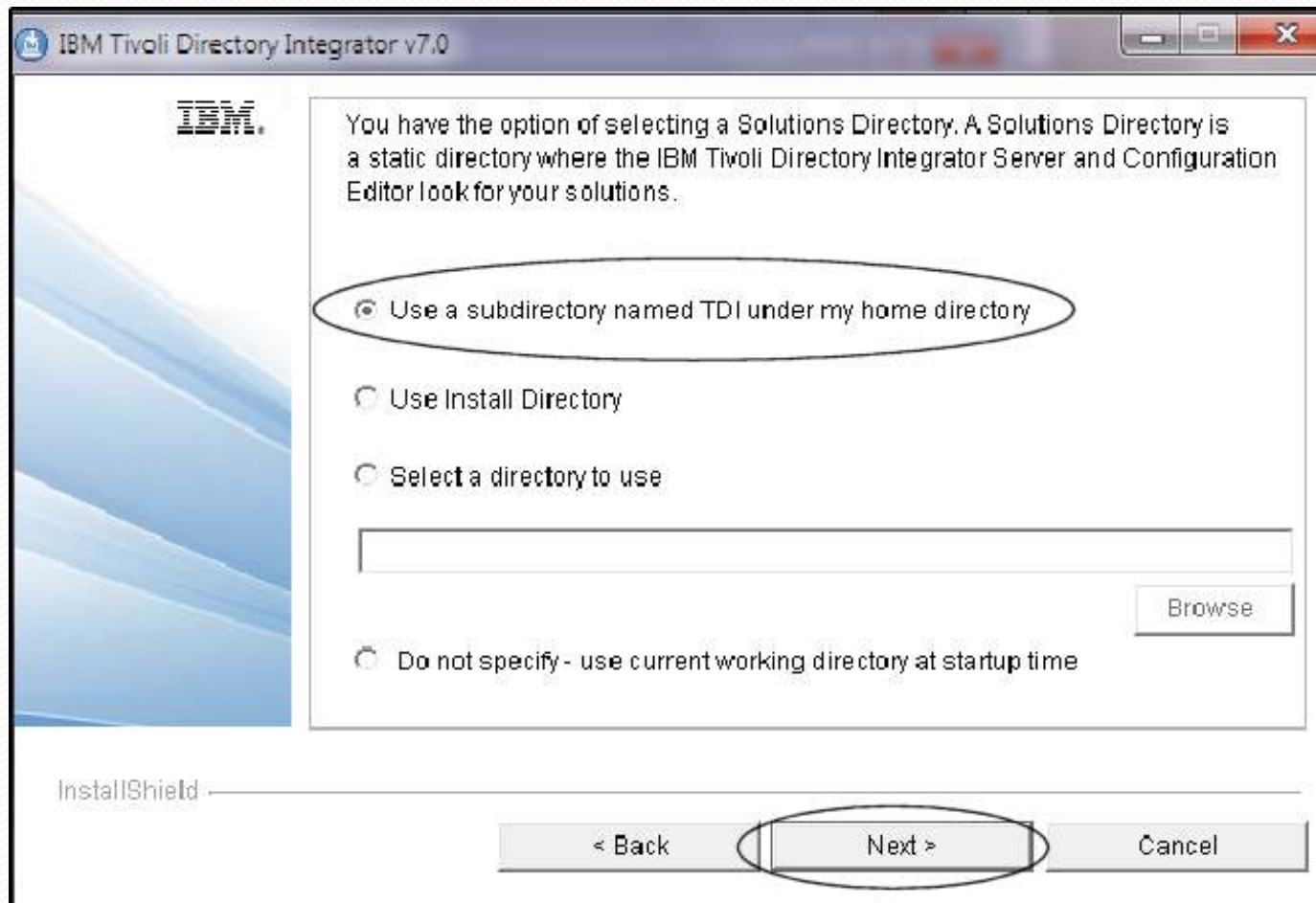
This is my default directory when installing onto a Microsoft Windows 7 platform on my laptop

Installing everything (disk space is cheap!)



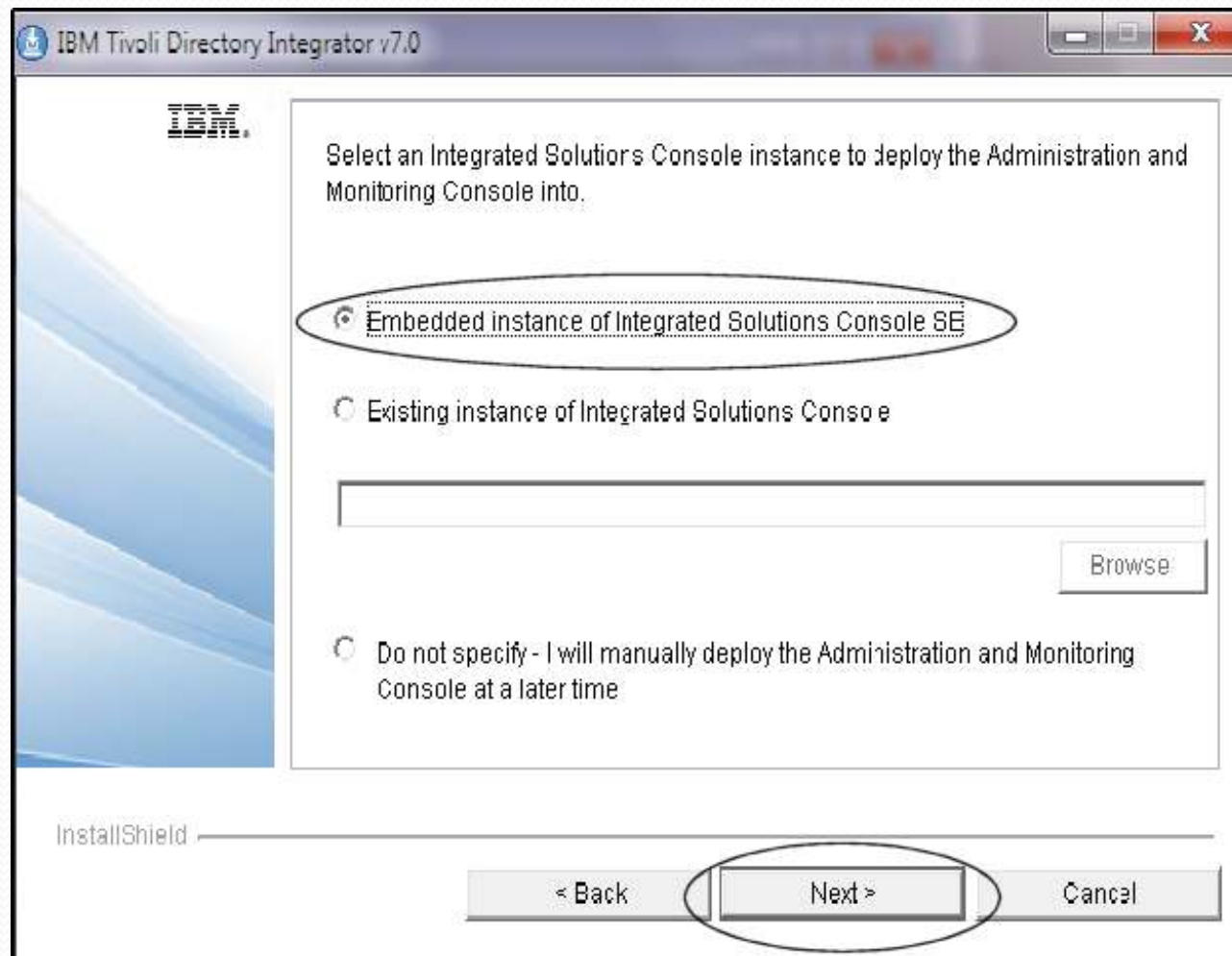
A true server installation would leave out Javadocs, examples, and IEHS. I'm installing here so that I have access to everything locally.

Choose your solutions directory...



You will have a chance to change this when you start up TDI.
Your AssemblyLines and jobs will be stored in this directory.

Select the embedded console...



Again, choosing this for local installation and no existing ISC anywhere.

Taking the default ports for TDI...

IBM Tivoli Directory Integrator v7.0

IBM

Enter the port values to be used by Integrated Solutions Console SE.

HTTP port:

HTTPS port:

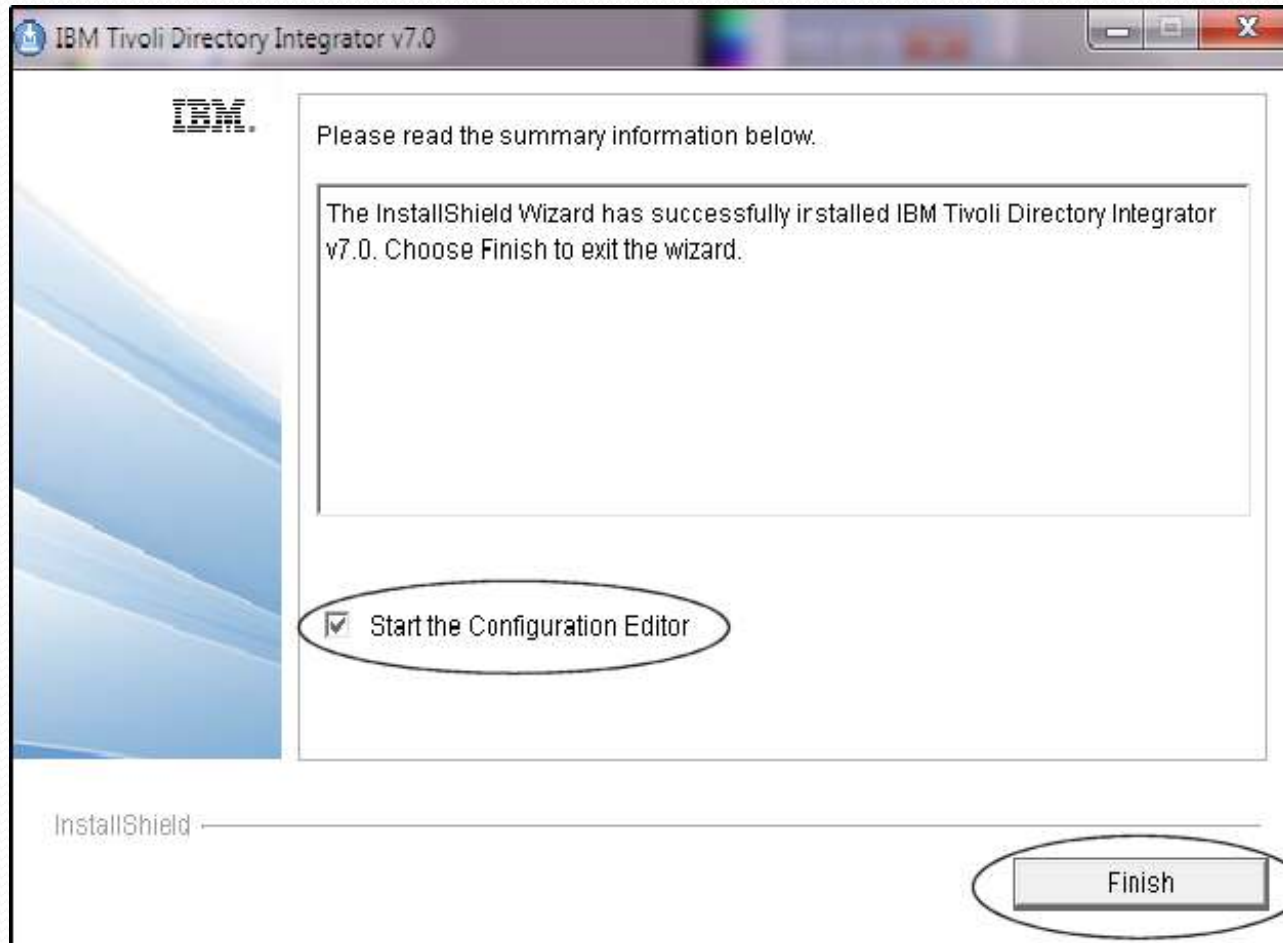
Action Manager API port:

InstallShield

< Back Next > Cancel

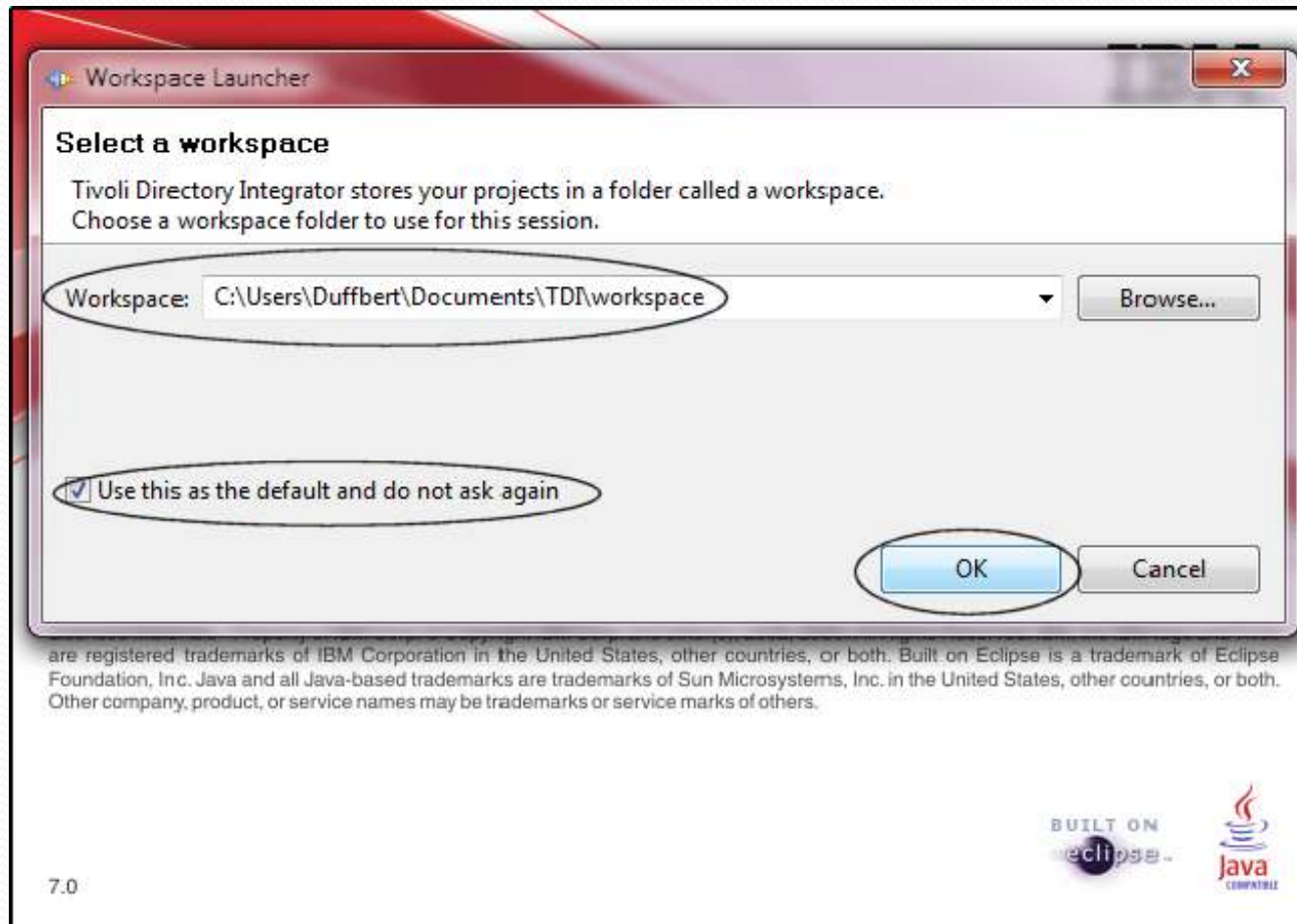
The screenshot shows a configuration window for IBM Tivoli Directory Integrator v7.0. The window title is "IBM Tivoli Directory Integrator v7.0". The main content area has the IBM logo on the left and a text prompt: "Enter the port values to be used by Integrated Solutions Console SE." Below this prompt are three text input fields. The first field is labeled "HTTP port:" and contains the value "13100". The second field is labeled "HTTPS port:" and contains the value "13101". The third field is labeled "Action Manager API port:" and contains the value "13104". A large black oval is drawn around these three input fields. At the bottom of the window, there is a navigation bar with three buttons: "< Back", "Next >", and "Cancel". The "Next >" button is highlighted with a black oval.

If all goes well, you're good to go!



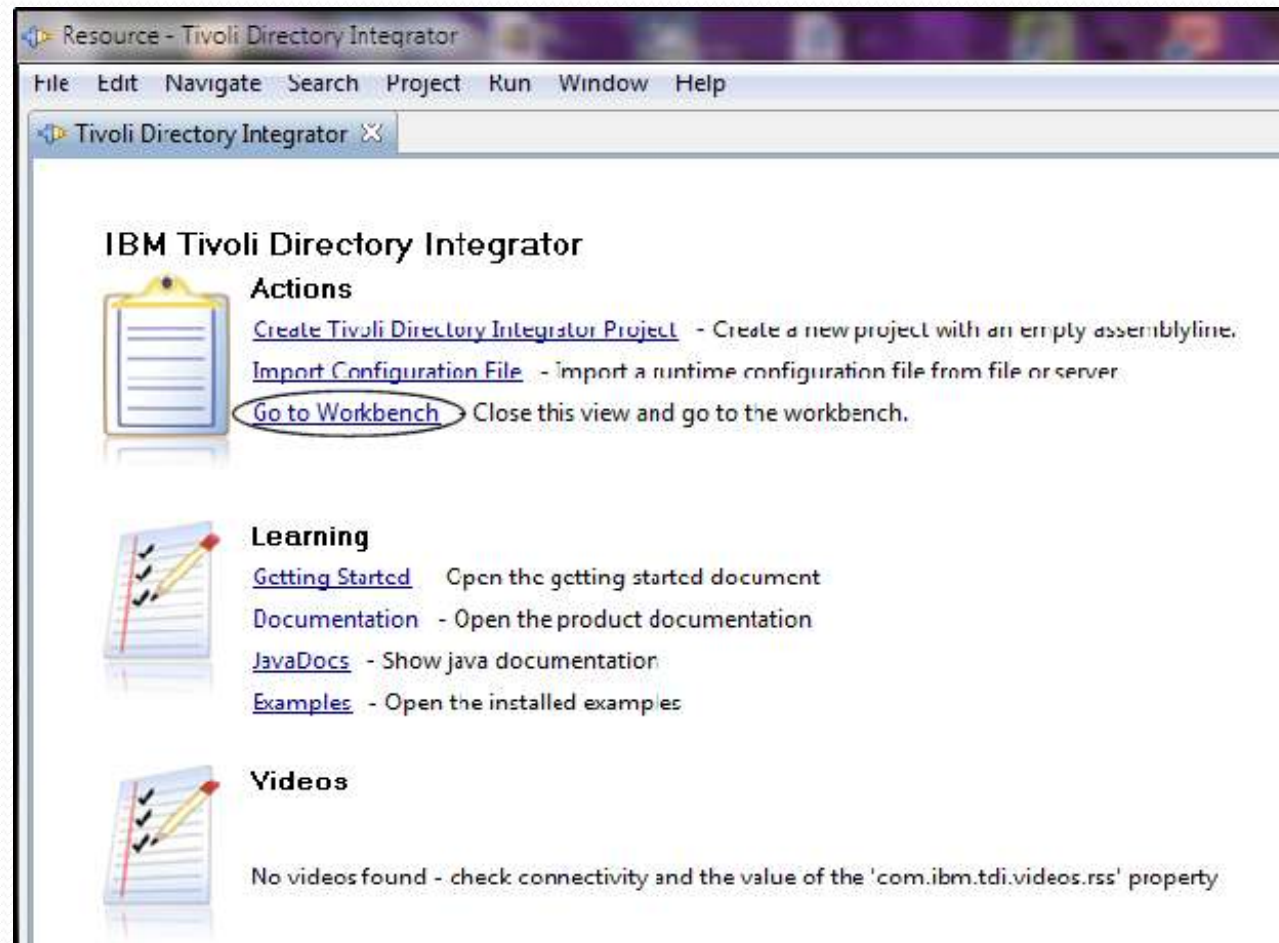
Since we're going directly into testing to see if TDI starts up, the Start the Configuration Editor option can remain selected.

Starting up TDI and selecting my solution directory



This is where you can change your solution directory, aka the “Workspace”. This can be useful if you want to have separate workspaces for different customers or jobs.

And we're there!



If all goes well, this is the screen we'll first see. Once you select the Go to Workbench option, you'll open up to that screen when you start up in subsequent sessions.

Job #1 after install... install fix packs!

The screenshot shows the IBM Fix Central website interface. At the top left is the IBM logo. To the right is a 'Country/region [select]' dropdown and a search bar with a 'Search' button. Below the header is a navigation menu with links for Home, Solutions, Services, Products, Support & downloads, and My IBM. On the right side of the header, it says 'Welcome [IBM Sign in] [Register]'. The main content area is titled 'Fix Central' and includes a left-hand navigation menu with options like 'Fix Central', 'Supported products', 'Enhancements', 'Help', 'Feedback', and 'Support questionnaire'. The main text explains that Fix Central provides fixes and updates for systems software, hardware, and operating systems, and includes a link for 'Getting started with Fix Central'. Below this, there are four dropdown menus for filtering search results: 'Product Group' (set to 'Tivoli'), 'Product' (set to 'IBM Tivoli Directory Integrator'), 'Installed Version' (set to '7.0.0'), and 'Platform' (set to 'Windows'). A 'Continue' button is located below these filters. At the bottom of the page, there are links for 'E-mail this page', 'Print this page', 'Digg this', and 'Save to del.icio.us', along with footer links for 'About IBM', 'Privacy', 'Contact', 'Terms of use', and 'IBM Feeds'.

As I learned, admins get really peeved if you don't do this. Fix Central is very easy to navigate, and should be a “must visit” site for the IBM software that you run and maintain.

<http://www.ibm.com/support/fixcentral/>

And to connect to Domino...

The screenshot shows a Windows Explorer window with the following details:

- Address bar: << Program Files (x86) > IBM > Lotus > Notes > jvm > lib > ext
- Search: Search ext
- Navigation: Organize, Include in library, Share with, Burn, New folder
- Left pane: Documents, Music, Pictures, Videos, Computer, Local Disk (C:), SINPLACE.~TR, SRECYCLE.BIN, SWINDOWS.~Q, ATI, boot, Config.Msi, Documents and Settings, HP, MSOCache, PerfLogs, Program Files, Program Files (x86), ProgramData, Recovery
- Right pane (Table):

Name	Date modified	Type	Size
healthcenter.jar	8/20/2009 10:51 AM	Executable Jar File	19 KB
ibmallt.jar	8/20/2009 10:55 AM	Executable Jar File	3,565 KB
ibmjcefiles.jar	8/20/2009 10:51 AM	Executable Jar File	235 KB
ibmjceprovider.jar	8/20/2009 10:51 AM	Executable Jar File	988 KB
ibmpkcs11impl.jar	8/20/2009 10:51 AM	Executable Jar File	343 KB
localedata.jar	8/20/2009 10:51 AM	Executable Jar File	458 KB
njempl.jar	9/29/2009 2:38 AM	Executable Jar File	132 KB
Notes.jar	9/29/2009 3:33 AM	Executable Jar File	1,938 KB
websvc.jar	9/29/2009 3:36 AM	Executable Jar File	1,449 KB
xsp.http.bootstrap.jar	9/26/2009 3:00 AM	Executable Jar File	17 KB

10 items

In order to connect to IBM Lotus Domino with TDI, you will need to copy the Notes.jar file from your IBM Lotus Notes installation...

Into the TDI directory...

Windows Explorer window showing the directory path: Program Files (x86) > IBM > TDI > V7.0 > jars > 3rdparty > IBM. The file list includes various .jar files, with 'Notes.jar' highlighted.

Name	Date modified	Type	Size
dsmI2.jar	2/9/2009 4:07 PM	Executable Jar File	410 KB
enroleagent.jar	2/9/2009 4:07 PM	Executable Jar File	294 KB
ibmjms.jar	2/9/2009 4:06 PM	Executable Jar File	26 KB
ibmjms.jar	4/23/2009 5:02 PM	Executable Jar File	889 KB
IBMLDAPJavaBer.jar	2/9/2009 4:08 PM	Executable Jar File	44 KB
icu4j_4_0.jar	2/9/2009 4:08 PM	Executable Jar File	5,515 KB
ITLMTToolkit.jar	2/9/2009 4:06 PM	Executable Jar File	33 KB
jffdc.jar	2/9/2009 4:06 PM	Executable Jar File	80 KB
jlog.jar	2/9/2009 4:06 PM	Executable Jar File	231 KB
LUMClient.jar	2/9/2009 4:08 PM	Executable Jar File	18 KB
MQeBase.jar	2/9/2009 4:06 PM	Executable Jar File	332 KB
MQeJMS.jar	2/9/2009 4:06 PM	Executable Jar File	110 KB
MQeSecurity.jar	2/9/2009 4:06 PM	Executable Jar File	73 KB
Notes.jar	9/28/2009 11:33 PM	Executable Jar File	1,938 KB
regex4j.jar	2/9/2009 4:07 PM	Executable Jar File	86 KB
remoteaccess.jar	11/29/2009 1:27 PM	Executable Jar File	609 KB
rx-langpack.jar	2/11/2009 4:00 PM	Executable Jar File	76 KB
snmp.jar	2/9/2009 4:07 PM	Executable Jar File	421 KB

... into the TDI installation under /IBM/TDI/V7.0/jars/3rdparty/IBM.
Without this, you'll get Java errors when trying to connect.

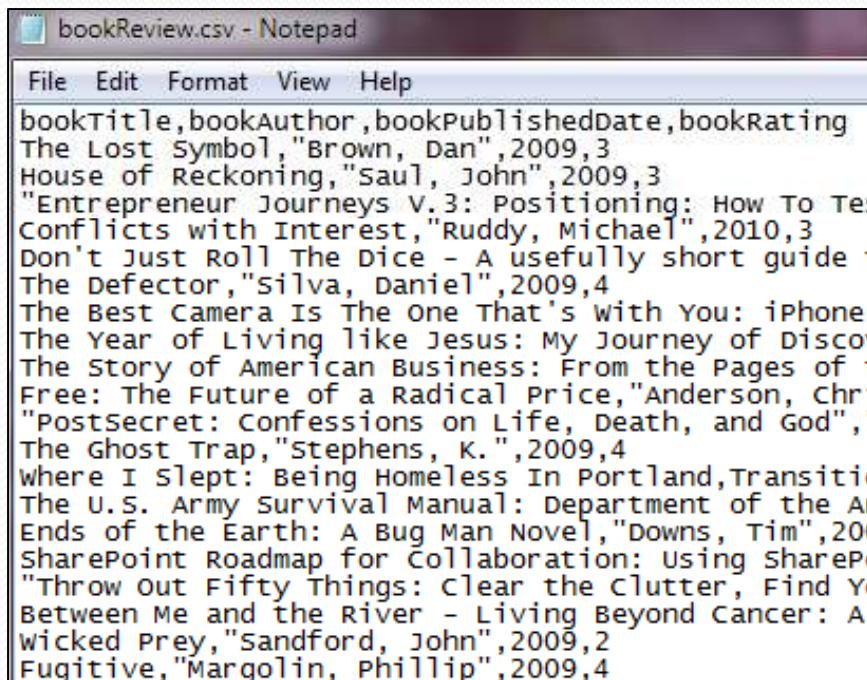


Example – CSV to Notes

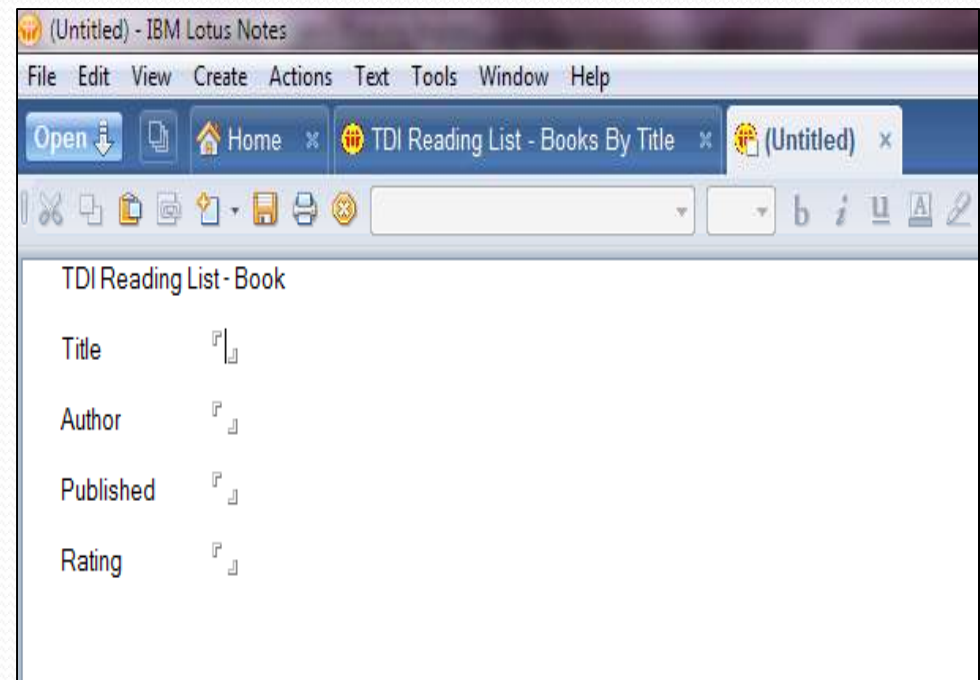
- In this scenario, we're going to demonstrate the creation of an Assembly Line that imports data from a CSV file into a Notes database

To begin...

You have a comma-separated values (.csv) file with data that you want to get into a Notes database.

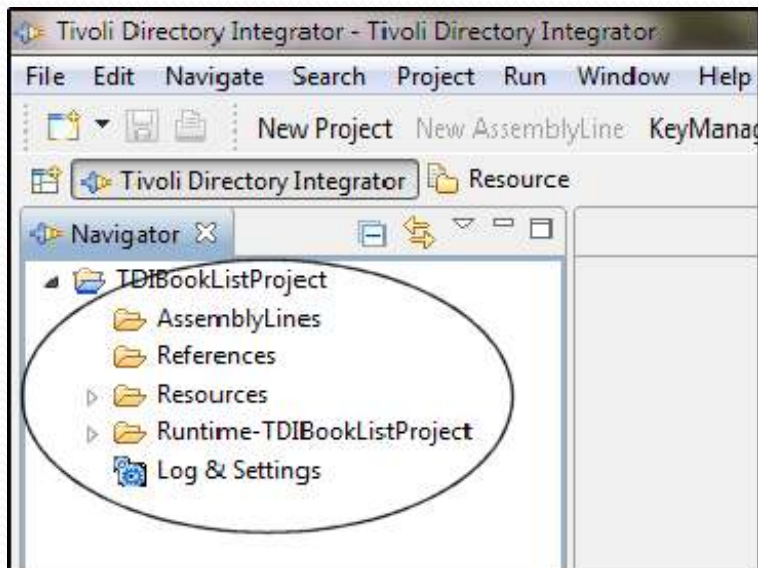
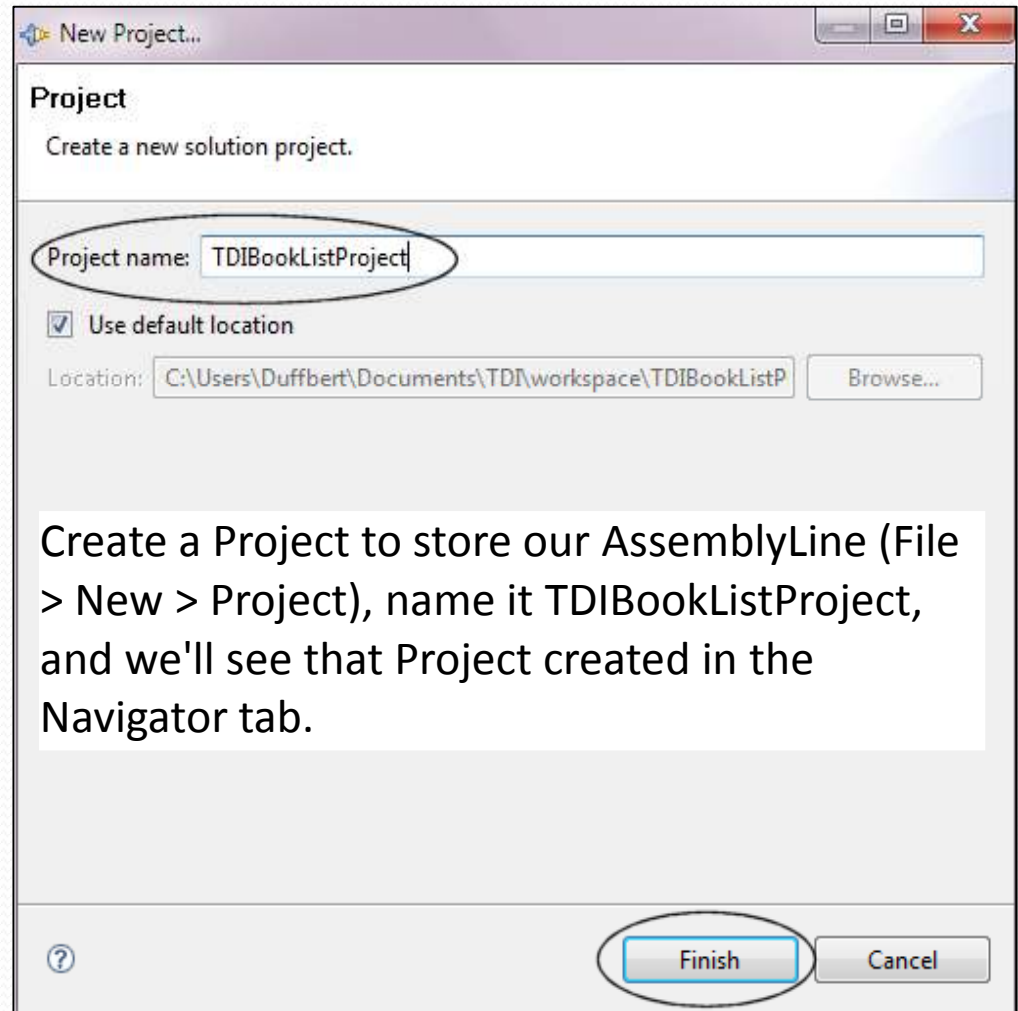
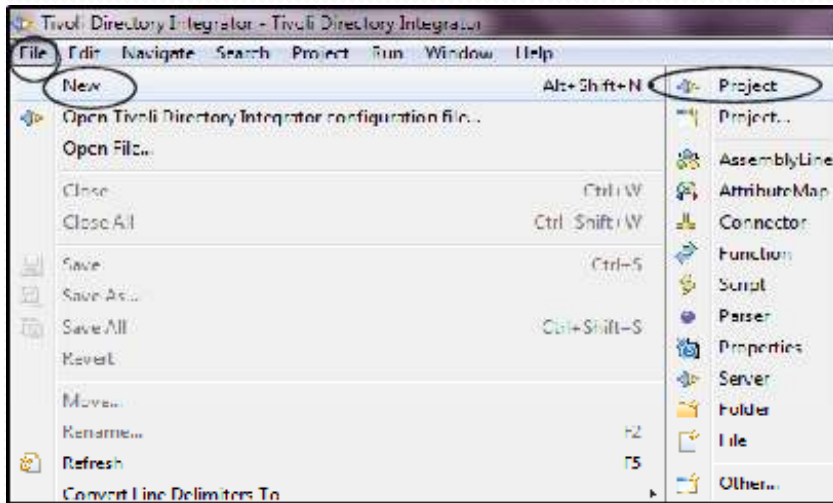


```
bookTitle,bookAuthor,bookPublishedDate,bookRating
The Lost Symbol,"Brown, Dan",2009,3
House of Reckoning,"Saul, John",2009,3
"Entrepreneur Journeys V.3: Positioning: How To Test
Conflicts with Interest,"Ruddy, Michael",2010,3
Don't Just Roll The Dice - A usefully short guide to
The Defector,"silva, Daniel",2009,4
The Best Camera Is The One That's with You: iPhone
The Year of Living like Jesus: My Journey of Discovery
The Story of American Business: From the Pages of the
Free: The Future of a Radical Price,"Anderson, Chris",2009,4
"PostSecret: Confessions on Life, Death, and God",
The Ghost Trap,"stephens, K.",2009,4
where I Slept: Being Homeless In Portland,Transitio
The U.S. Army Survival Manual: Department of the Army
Ends of the Earth: A Bug Man Novel,"Downs, Tim",2009,4
SharePoint Roadmap for Collaboration: Using SharePoint
"Throw Out Fifty Things: Clear the Clutter, Find Your
Between Me and the River - Living Beyond Cancer: A
Wicked Prey,"sandford, John",2009,2
Fugitive,"Marqolin, Phillip",2009,4
```



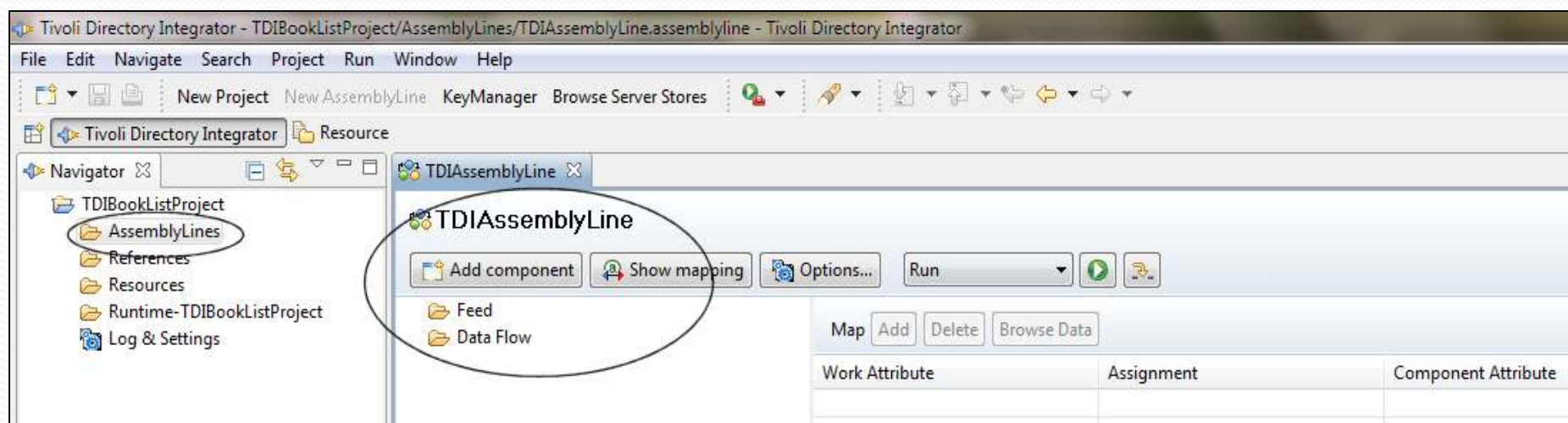
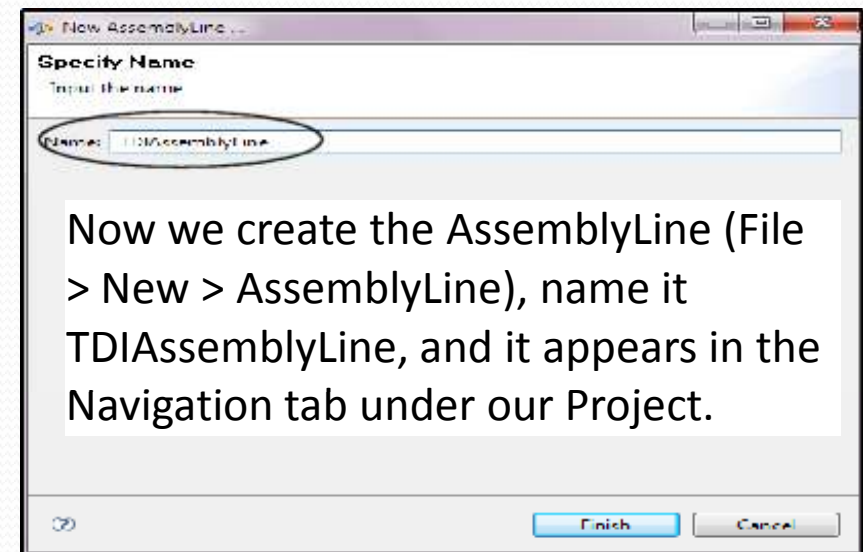
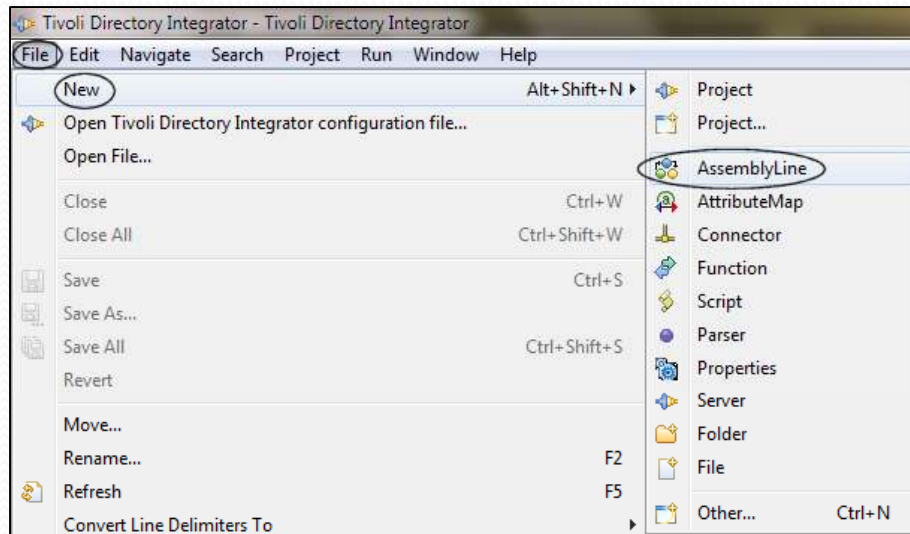
Truly nothing fancy here... four fields in a .csv file, four fields in the Notes database.

Creating the Project for our job...

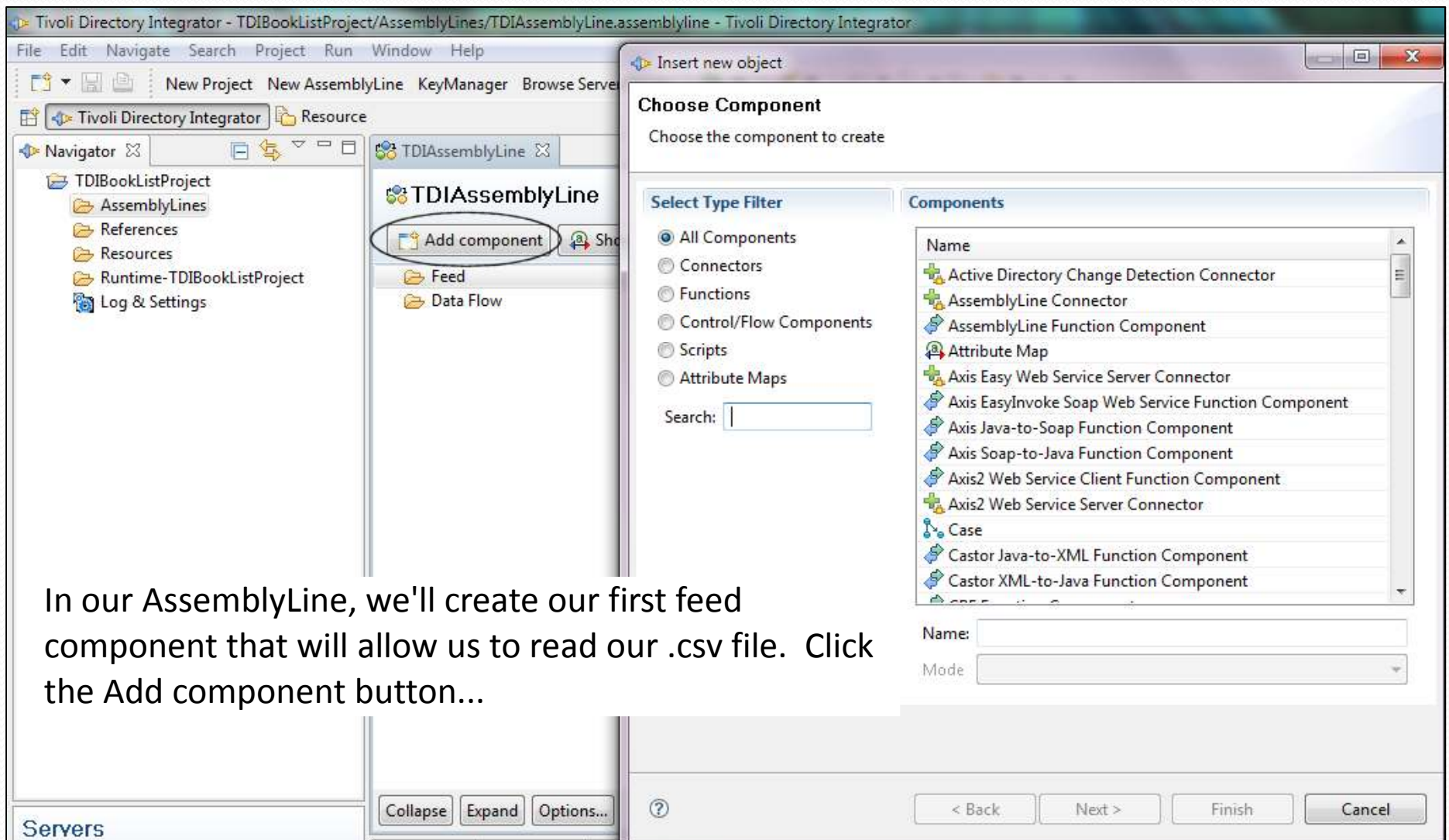


Create a Project to store our AssemblyLine (File > New > Project), name it TDIBookListProject, and we'll see that Project created in the Navigator tab.

Creating the AssemblyLine...



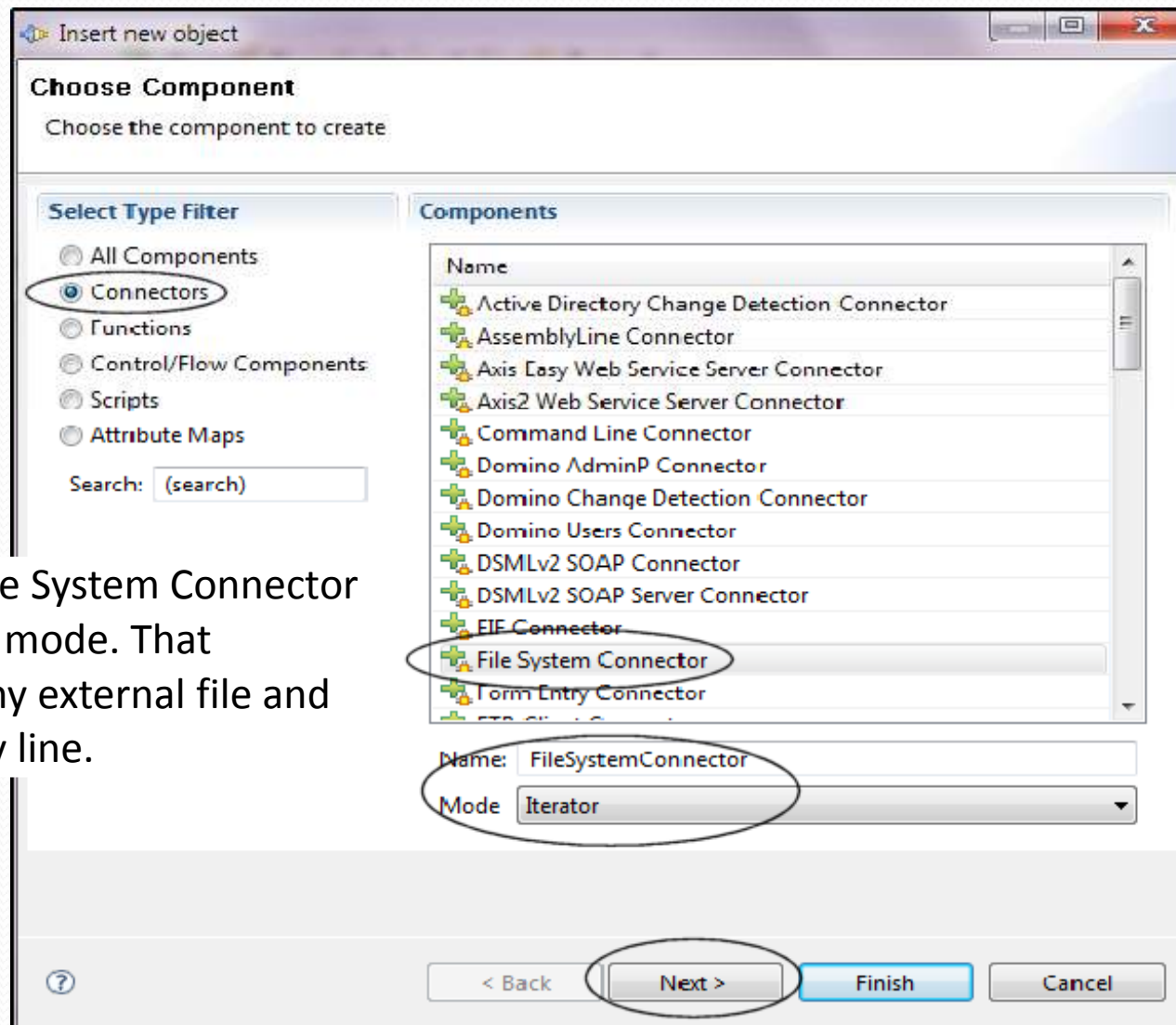
First job is to build the Feed Connector..



The screenshot displays the Tivoli Directory Integrator interface. On the left, the Navigator pane shows the project structure: TDIBookListProject > AssemblyLines > TDIAssemblyLine. The 'Add component' button is circled in the TDIAssemblyLine view. On the right, the 'Insert new object' dialog box is open, titled 'Choose Component'. It features a 'Select Type Filter' section with radio buttons for 'All Components', 'Connectors', 'Functions', 'Control/Flow Components', 'Scripts', and 'Attribute Maps'. Below this is a search field. The 'Components' list on the right includes various connectors and function components, such as 'Active Directory Change Detection Connector', 'AssemblyLine Connector', and 'Axis Easy Web Service Server Connector'. At the bottom of the dialog, there are fields for 'Name' and 'Mode', and navigation buttons: '< Back', 'Next >', 'Finish', and 'Cancel'.

In our AssemblyLine, we'll create our first feed component that will allow us to read our .csv file. Click the Add component button...

Choose the File System Connector...



Choose the File System Connector in the Iterator mode. That connects to any external file and reads it line by line.

Get the actual location of the file...

Insert new object

Connector Configuration

File System Connector

Help

File Path * C:\Users\Duffbert\Desktop\bookReview.csv Select... ?

Comment ?

Detailed Log ?

Advanced

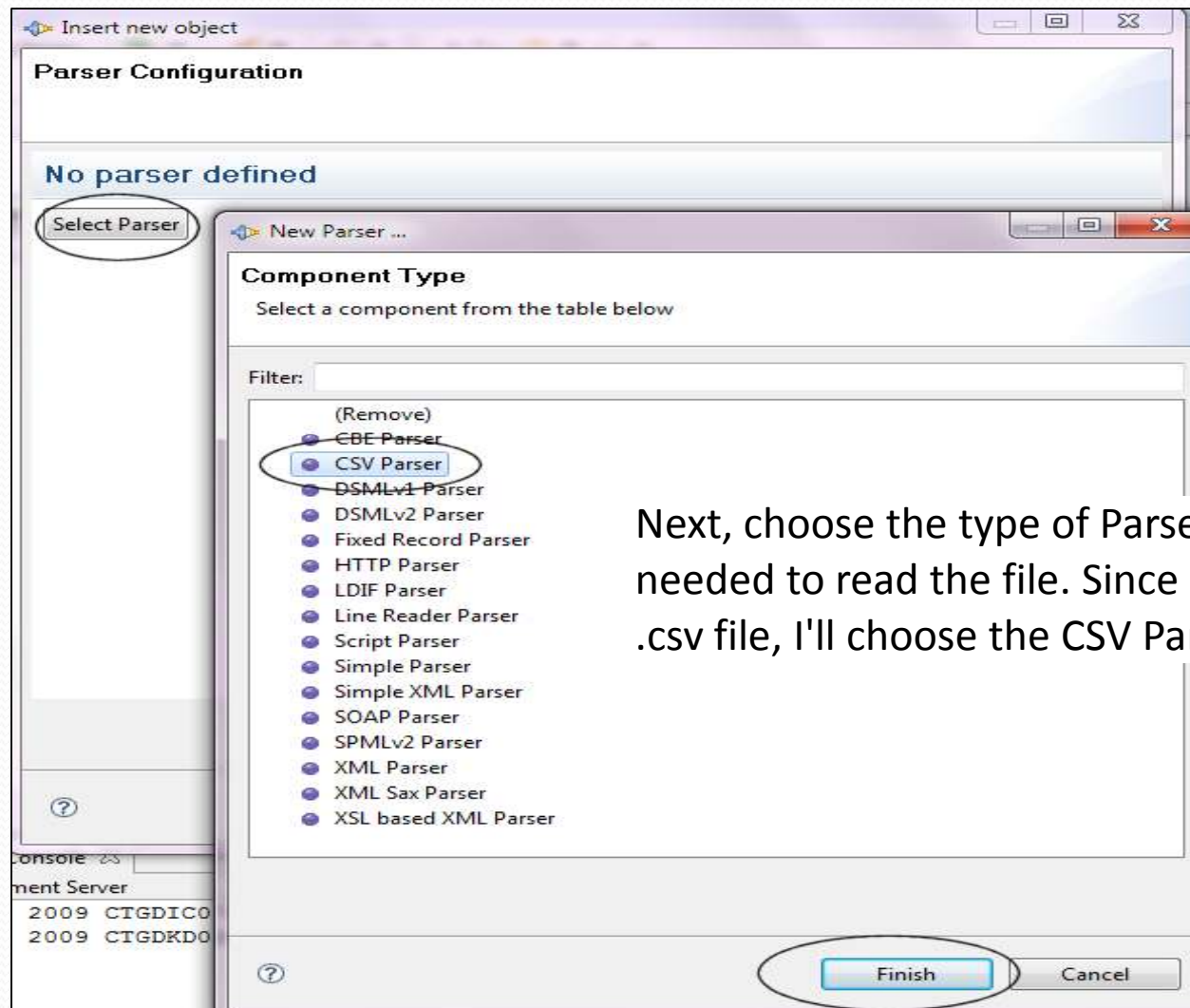
Timeout (in seconds) ?

Lock file ?

Choose the location of the .csv file that you'll be reading in...

< Back Next > Finish Cancel

The next option selects the parser...



Next, choose the type of Parser that will be needed to read the file. Since we're reading a .csv file, I'll choose the CSV Parser...

We have to make sure the parser is configured...

The screenshot shows a dialog box titled "Insert new object" with a sub-section "Parser Configuration". Under "CSV Parser", there are "Select Parser" and "Help" buttons. The "Field Separator" is set to a comma (,) and is circled in red. Below it is a "Comment" text area. There is a "Detailed Log" checkbox which is unchecked. An "Advanced" section is expanded, showing a "Field Names" text area. At the bottom, there are four buttons: "?", "< Back", "Next >", and "Finish" (which is circled in red), followed by "Cancel".

You may have to configure the parser. In this case, I needed to change the Field Separator from ; to , to make it conform to my file.

Field names, in the order they

The Feed Connector is now configured...

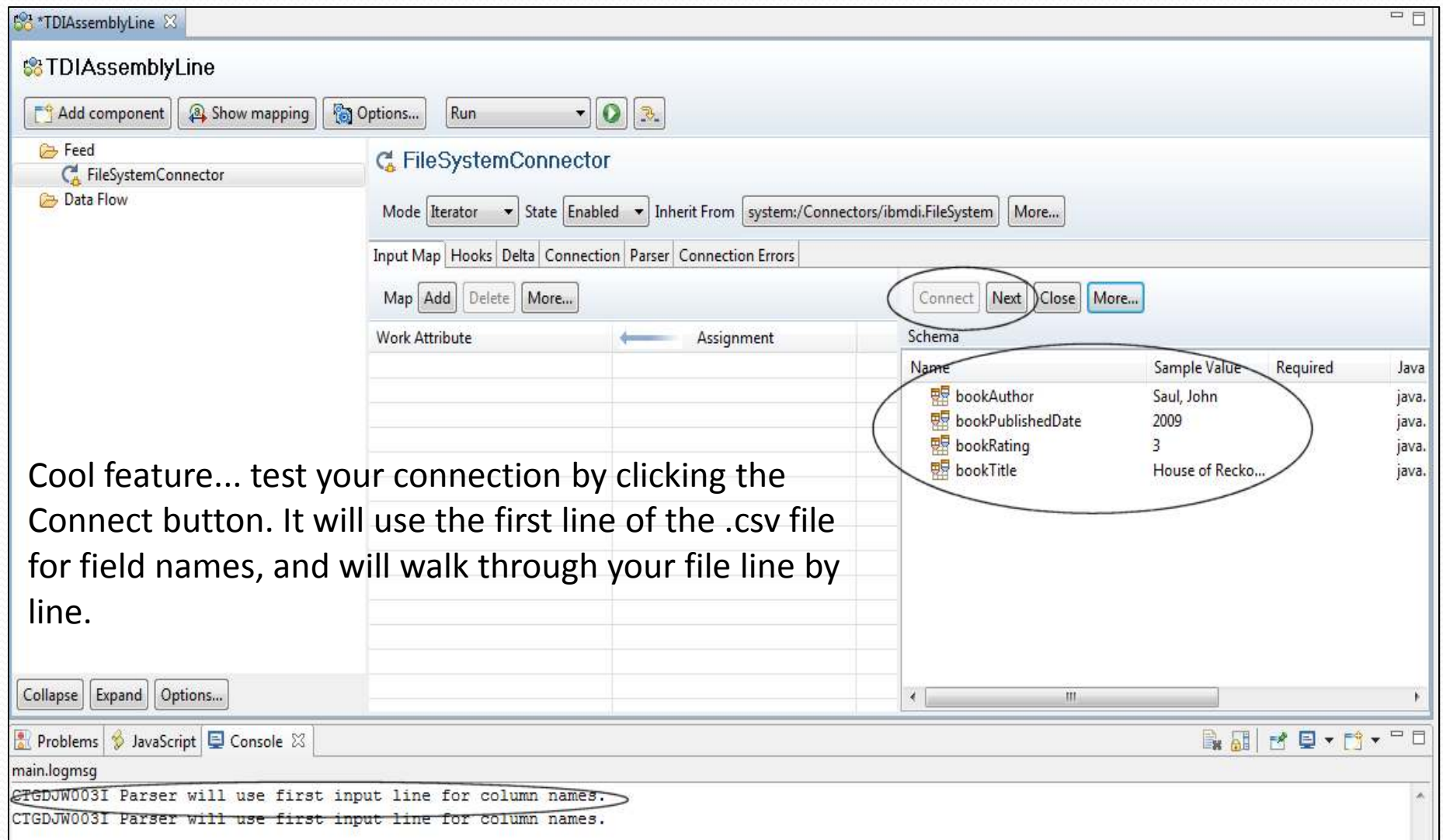
The screenshot displays the TDIAssemblyLine configuration window. The 'Feed' component is expanded, showing the 'FileSystemConnector' component. The 'Mode' is set to 'Iterator' and the 'State' is 'Enabled'. The 'Inherit From' property is set to 'system:/Connectors/ibmdi.FileSystem'. The 'Input Map' tab is selected, showing a table for mapping work attributes to assignments. The 'Schema' tab is also visible, showing a table for defining the data schema.

Work Attribute	Assignment

Name	Sample Value	Required	Java

The File System Connector is now complete, set to iterate through the file and parsing the lines via the comma separator.

Test your connection to the file...

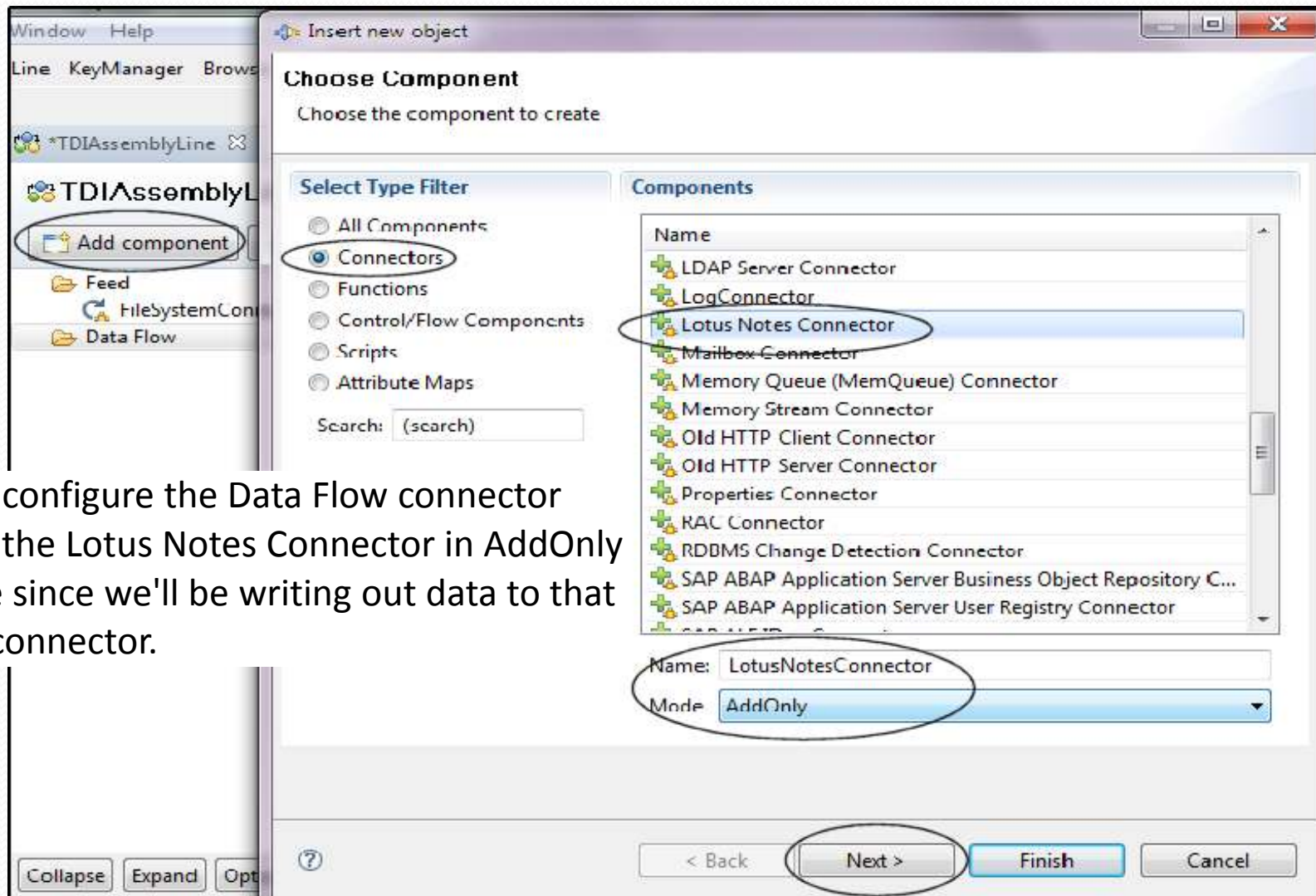


Cool feature... test your connection by clicking the Connect button. It will use the first line of the .csv file for field names, and will walk through your file line by line.

Name	Sample Value	Required	Java
bookAuthor	Saul, John		java.
bookPublishedDate	2009		java.
bookRating	3		java.
bookTitle	House of Recko...		java.

```
main.logmsg
CTGDJW003I Parser will use first input line for column names.
CTGDJW003I Parser will use first input line for column names.
```

Now, we'll configure the Data Flow Connector...



Next, configure the Data Flow connector using the Lotus Notes Connector in AddOnly Mode since we'll be writing out data to that data connector.

Configuration of the Lotus Notes Connector...

Insert new object

Connector Configuration

Lotus Notes Connector

Help

Domino Server IP Address * ?

Domino Server Name ?

HTTP port 80 ?

Session Type * LocalClient ?

Username ?

Password * ?

Database * TDIRReadingList.nsf ?

Comment ?

? < Back Next > Finish Cancel

For this example, we'll use a LocalClient session, enter the password of our Notes ID, and choose the database we'll be connecting to...

And if that connection works...

The screenshot displays the IBM Tivoli Directory Integrator (TDI) interface. The main window shows the configuration for a **LotusNotesConnector** component. The component is set to **Mode: AddOnly**, **State: Enabled**, and **Inherit From: system/Connectors/ibmdi.Notes**. The **Output Map** tab is active, showing an empty table for mapping data. The **Assignment** and **Component Attribute** tables are also empty. The **Schema** table is visible with columns for **Name**, **Sample Value**, **Required**, and **Java**.

At the bottom of the interface, the **Problems** console shows the following log messages:

```
main.logmsg
CTGDIV002I Opening Session to Domino Server: Session Type='LocalClient',, Hostname='{1}', User ID='{2}', Requested IIOP/SSL='false'.
CTGDIV049I Session to Domino Server is created.
CTGDIV005I Successfully connected to Domino Server: Name='', Version='Release 8.5.1|September 28, 2009', Platform='Windows/32'.
```

The final log message, **CTGDIV005I Successfully connected to Domino Server: Name='', Version='Release 8.5.1|September 28, 2009', Platform='Windows/32'.**, is circled in red, indicating a successful connection to the Domino Server.

And if our Lotus Notes Connector is configured correctly, we should see a message in the Problems box that says we connected to the Domino Server, which means our local client.

Get the fields from the File Connector..

Back in our File Connector, we'll click the Add button under Mappings to select the fields we'll be reading...

Name	Sample Value
bookAuthor	Brown, Dan
bookPublishedDate	2009
bookRating	3
bookTitle	The Lost Symbol

And here's how the configuration looks...

The screenshot shows the Tivoli Directory Integrator interface. The main window is titled "Tivoli Directory Integrator - TDIBookListProject/AssemblyLines/TDIAssemblyLine.assemblyline". The left sidebar shows a project tree with "TDIAssemblyLine" selected. The main area displays the configuration for the "File System Connector". The "Mode" is set to "Iterator", "State" is "Enabled", and "Inherit From" is "system:/Connectors/ibmdi.FileSystem". The "Input Map" tab is active, showing a table of work attributes and their assignments. A blue circle highlights the "Work Attribute" and "Assignment" columns. The "Schema" table on the right shows the mapping of attributes to sample values.

And when finished, it should look like this on the File System Connector page...

Work Attribute	Assignment
bookAuthor	conn.bookAuthor
bookPublishedDate	conn.bookPublishedDate
bookRating	conn.bookRating
bookTitle	conn.bookTitle

Name	Sample Value	Required
bookAuthor	Brown, Dan	
bookPublishedDate	2009	
bookRating	3	
bookTitle	The Lost Symbol	

Select the fields from the Notes Connection...

The screenshot shows the TDIAssemblyLine interface. On the left, a tree view shows 'Data Flow' containing 'LotusNotesConnector', which is circled. In the center, the 'LotusNotesConnector' configuration panel has the 'Add' button circled. On the right, the 'Add attribute' dialog box is open, showing a list of attributes: '* (Map all Attributes)', 'bookAuthor', 'bookPublishedDate', 'bookRating', and 'bookTitle'. The last four are checked and circled. At the bottom of the dialog, the 'OK' button is circled.

Then, we choose what fields we'll map to in the Lotus Notes Connector...

And now we have the other end configured...

The screenshot shows the Tivoli Directory Integrator (TDI) configuration interface. The left pane shows a project tree with 'LotusNotesConnector' selected under 'Data Flow'. The main pane shows the configuration for 'LotusNotesConnector' with the following settings:

- Mode: AddOnly
- State: Enabled
- Inherit From: system:/Connectors/ibmdi.Notes

The 'Output Map' tab is active, showing a table with the following data:

Assignment	Component Attribute
work.bookAuthor	bookAuthor
work.bookPublishedDate	bookPublishedDate
work.bookRating	bookRating
work.bookTitle	bookTitle

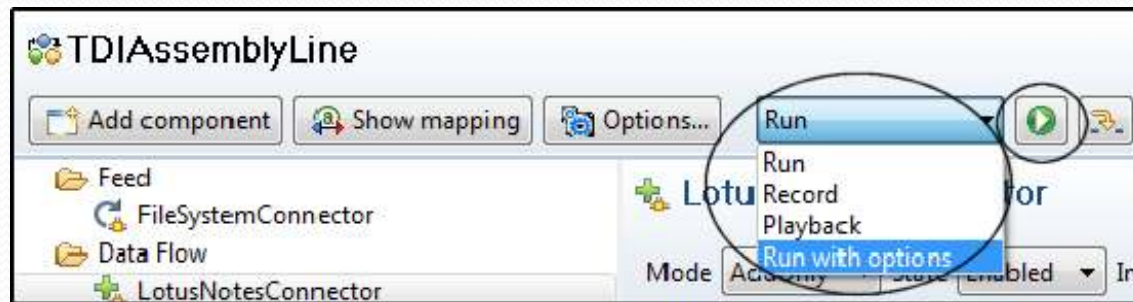
The 'Schema' tab is also visible, showing a table with the following headers:

Name	Sample Value	Required	Java
------	--------------	----------	------

At the bottom left, there are buttons for 'Collapse', 'Expand', and 'Options...'. The 'Servers' pane is visible at the bottom left of the window.

And like before, the finished configuration should look like this...

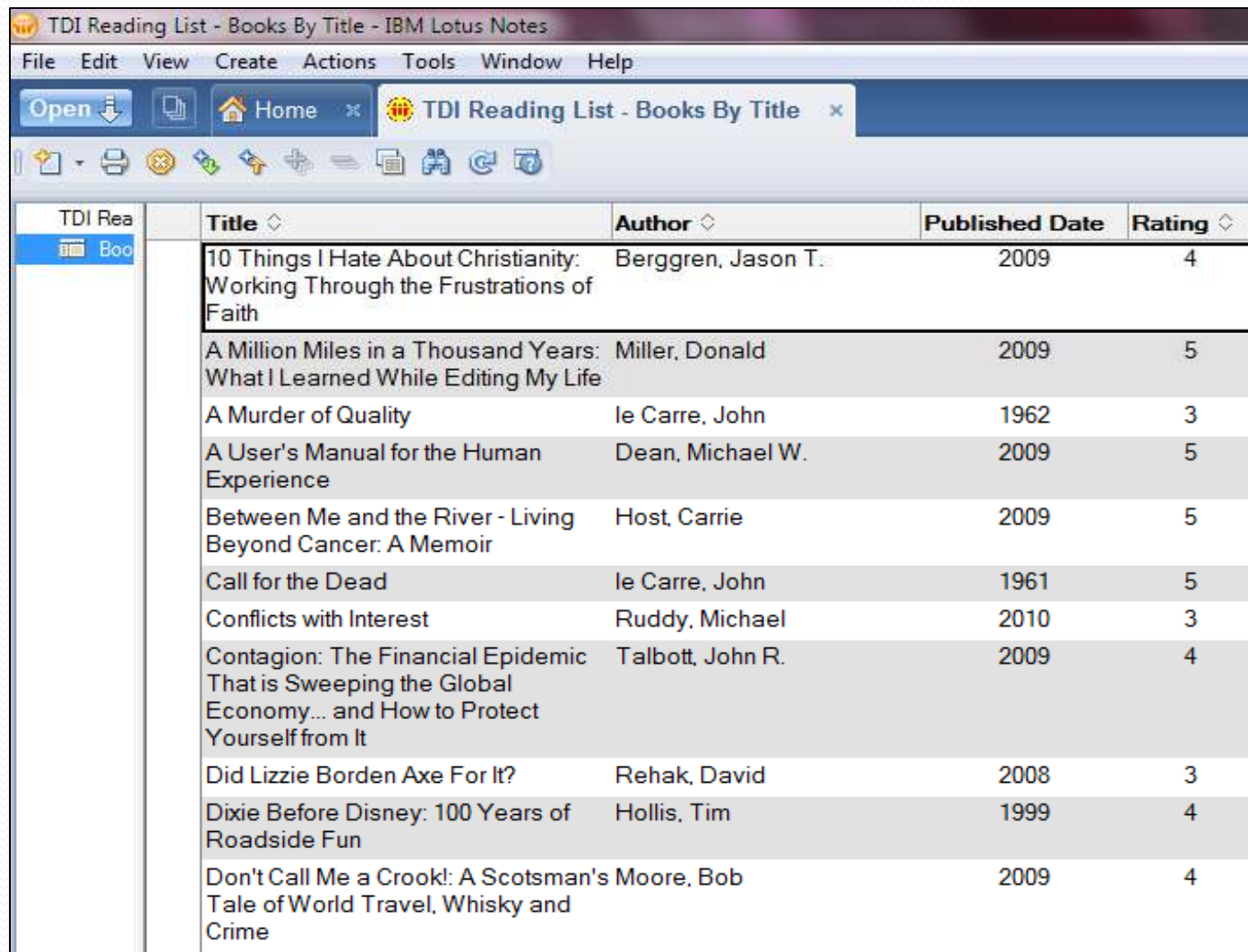
And now we can run it!



```
*TDIAssemblyLine  TDIAssemblyLine X
12:59:04,995 INFO - [FileSystemConnector] CTGDJW003I Parser will use first input line for column names.
12:59:05,541 INFO - [LotusNotesConnector] CTGDIV002I Opening Session to Domino Server: Session Type='LocalClient',, Hostname='{1}', User ID='
12:59:05,977 INFO - [LotusNotesConnector] CTGDIV049I Session to Domino Server is created.
12:59:05,977 INFO - [LotusNotesConnector] CTGDIV005I Successfully connected to Domino Server: Name='', Version='Release 8.5.1|September 28, 20
12:59:05,977 INFO - CTGDIS087I Iterating.
12:59:06,243 INFO - CTGDIS088I Finished iterating.
12:59:06,258 INFO - CTGDIS100I Printing the Connector statistics.
12:59:06,258 INFO - [FileSystemConnector] Get:87
12:59:06,258 INFO - [LotusNotesConnector] Add:87
12:59:06,258 INFO - CTGDIS104I Total: Get:87, Add:87.
12:59:06,258 INFO - CTGDIS101I Finished printing the Connector statistics.
12:59:06,305 INFO - CTGDIS080I Terminated successfully (0 errors).
```

All that's left is to run it. On the console, you'll see the parser config, the connection to Domino, the iteration through the file, and the printing of statistics... All in less than two seconds...

And we look at our Notes database output...



The screenshot shows the IBM Lotus Notes interface with a database table titled "TDI Reading List - Books By Title". The table has four columns: Title, Author, Published Date, and Rating. The data is as follows:

Title	Author	Published Date	Rating
10 Things I Hate About Christianity: Working Through the Frustrations of Faith	Berggren, Jason T.	2009	4
A Million Miles in a Thousand Years: What I Learned While Editing My Life	Miller, Donald	2009	5
A Murder of Quality	le Carre, John	1962	3
A User's Manual for the Human Experience	Dean, Michael W.	2009	5
Between Me and the River - Living Beyond Cancer: A Memoir	Host, Carrie	2009	5
Call for the Dead	le Carre, John	1961	5
Conflicts with Interest	Ruddy, Michael	2010	3
Contagion: The Financial Epidemic That is Sweeping the Global Economy... and How to Protect Yourself from It	Talbott, John R.	2009	4
Did Lizzie Borden Axe For It?	Rehak, David	2008	3
Dixie Before Disney: 100 Years of Roadside Fun	Hollis, Tim	1999	4
Don't Call Me a Crook!: A Scotsman's Tale of World Travel, Whisky and Crime	Moore, Bob	2009	4



Example – Notes data to XML

- In this scenario, we're going to demonstrate how to use an Assembly line to extract data from a Notes database to XML and at the same time we're going to do some data manipulation.

To begin...

You have a Notes database with data that you need to export into XML format, along with some data scrubbing requirements.

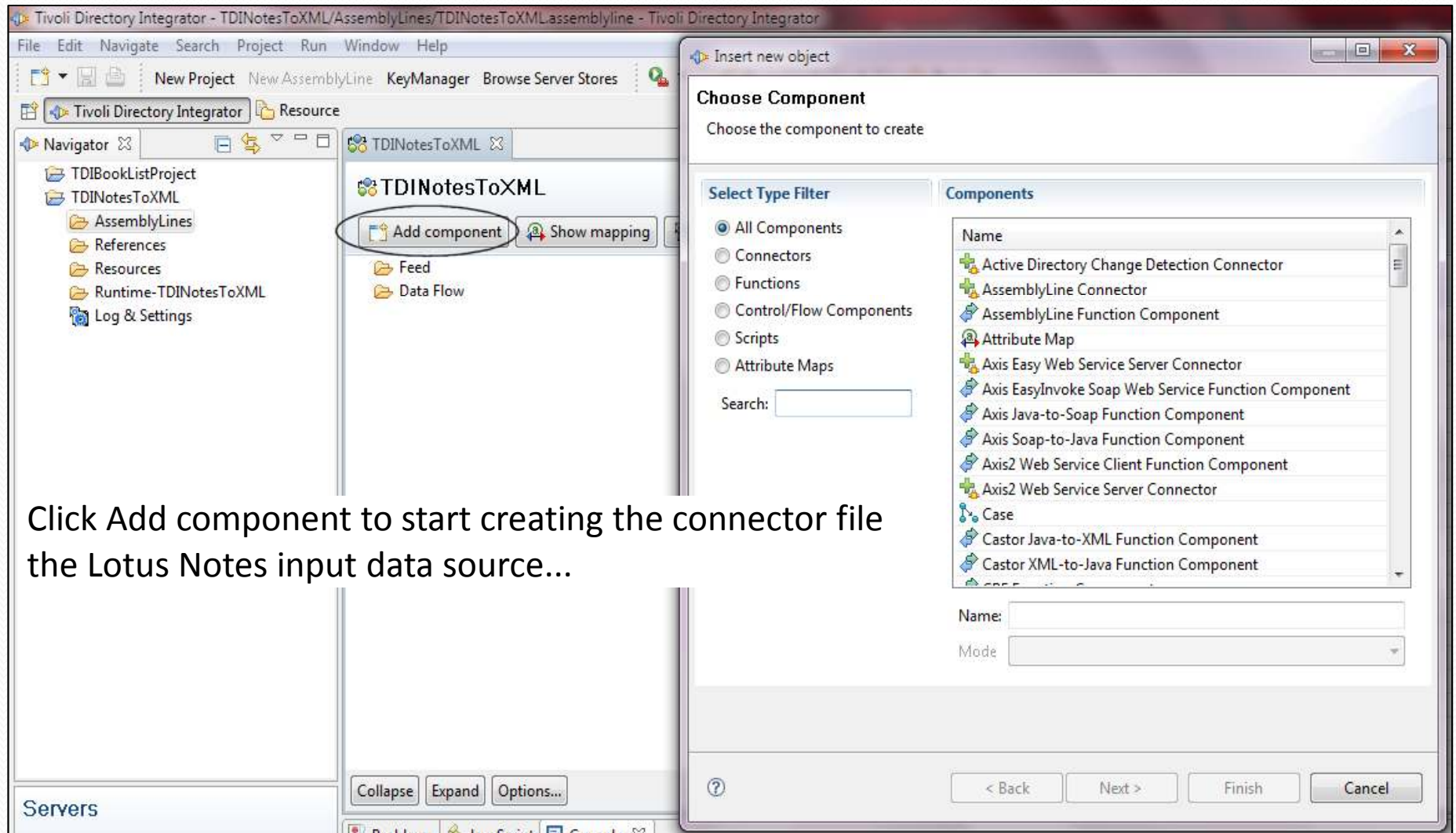
This is the same Notes database we created in the first example...



The screenshot shows the IBM Lotus Notes interface. The title bar reads "TDI Reading List - Books By Title - IBM Lotus Notes". The menu bar includes "File", "Edit", "View", "Create", "Actions", "Tools", "Window", and "Help". The toolbar contains icons for "Open", "Home", and "Workspace". The main content area displays a table with the following data:

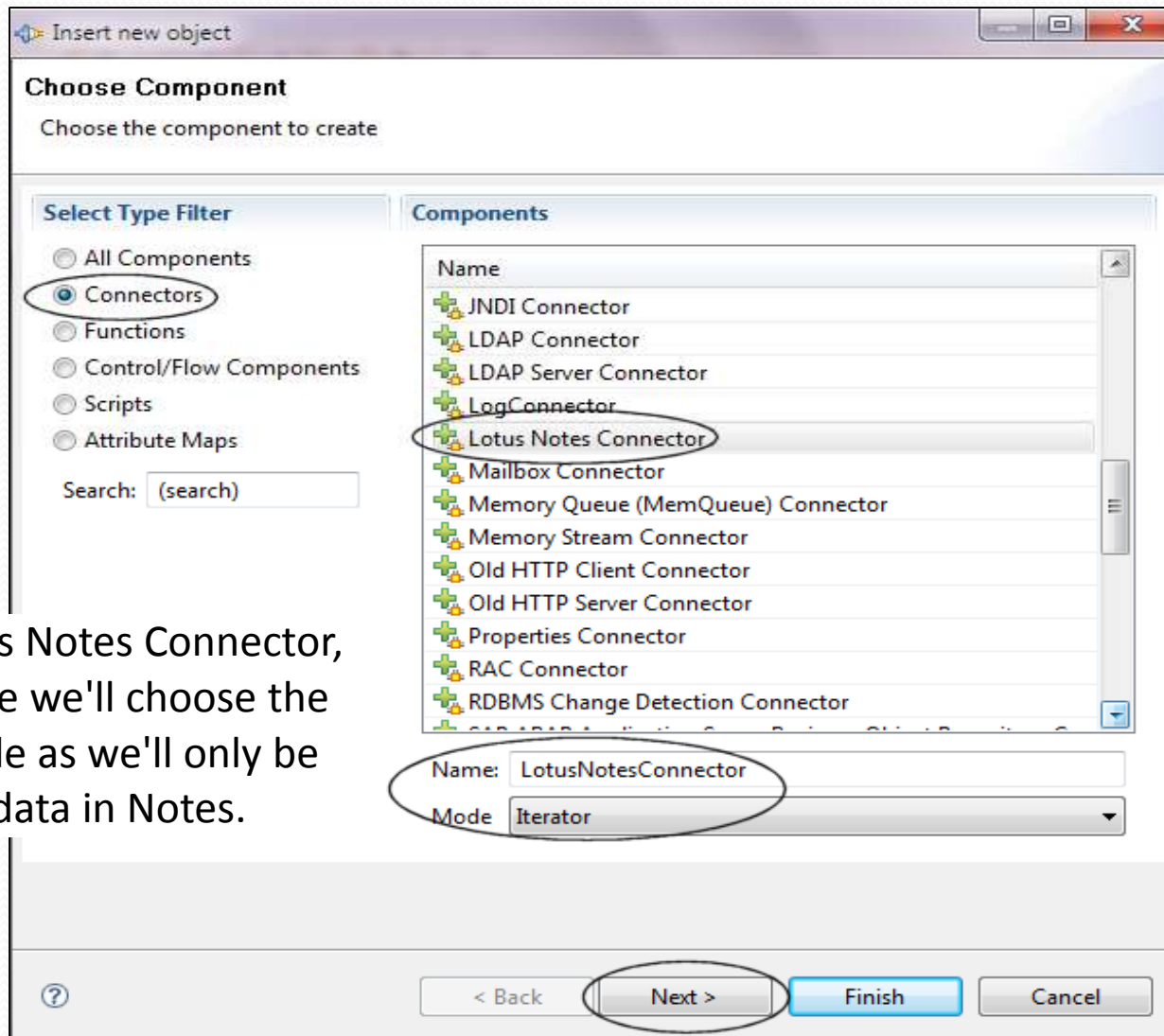
Title	Author	Published Date	Rating
10 Things I Hate About Christianity: Working Through the Frustrations of Faith	Berggren, Jason T.	2009	4
A Million Miles in a Thousand Years: What I Learned While Editing My Life	Miller, Donald	2009	5
A Murder of Quality	le Carre, John	1962	3
A User's Manual for the Human Experience	Dean, Michael W.	2009	5
Between Me and the River - Living Beyond Cancer: A Memoir	Host, Carrie	2009	5
Call for the Dead	le Carre, John	1961	5
Conflicts with Interest	Ruddy, Michael	2010	3
Contagion: The Financial Epidemic That is Sweeping the Global Economy... and How to Protect Yourself from It	Talbott, John R.	2009	4
Did Lizzie Borden Axe For It?	Rehak, David	2008	3
Dixie Before Disney: 100 Years of Roadside Fun	Hollis, Tim	1999	4

First create the Project and AssemblyLine, and then it's time to build the Feed Connector...



Click Add component to start creating the connector file the Lotus Notes input data source...

Choose the Lotus Notes Connector...



Choose Lotus Notes Connector, only this time we'll choose the Iterator Mode as we'll only be reading the data in Notes.

Configure The Notes Connector like you did in the last job... And if that connection works...

The screenshot shows the Tivoli Directory Integrator (TDI) configuration window for a project named 'TDINotesToXML'. The 'LotusNotesConnector' component is selected in the Navigator and is configured with the following settings:

- Mode: Version
- State: Enabled
- Inherit From: system/Connectors/ibmtdi/Notes
- Input Map: Hooks, Data, Connection, Connection Errors
- Map: Add, Define, More...
- Work Attribute: Assignment
- Schema: A table with columns Name, Sample Value, Required, and Java.

Buttons for 'Connect', 'New', 'Close', and 'More...' are visible in the configuration area.

The console log at the bottom shows the following messages:

```
main.log/msg
CIGDIW049I Session to Domino Server is created.
CIGDIW057I Successfully connected to Domino Server: Name='', Version='Release 8.5.1|September 28, 2009', Platform='Windows/32'.
CIGDIW062I Opening Session to Domino Server: Session Type='LocalGiants', Hostname='41', User ID='{2}', Requested IIOP/SSL='false'.
CIGDIW049I Session to Domino Server is created.
CIGDIW061I Successfully connected to Domino Server: Name='', Version='Release 8.5.1|September 28, 2009', Platform='Windows/32'.
CIGDIW061I Database search returned 07 documents.
```

And if the connector works, you'll see the connection message in the Problems area (but you can't iterate through the Notes data, unfortunately...)

Now we add the field names we'll be exporting...

For mapping the data in the Notes database, you have to manually key in the field names...

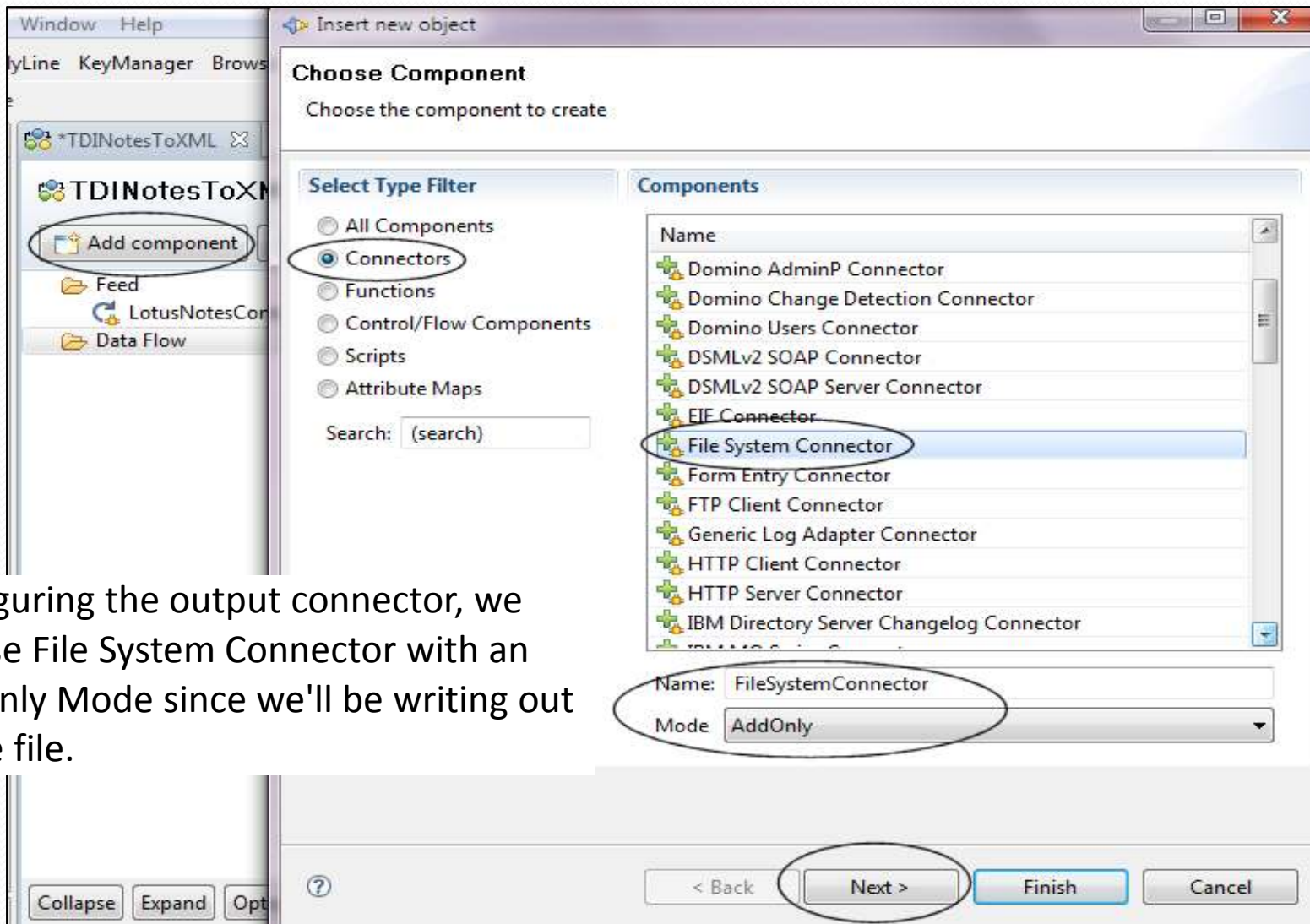
The screenshot shows the TDINotesToXML application interface. On the left, the 'Show mapping' button is circled. The 'Add attribute' dialog box is open, showing a 'Select Attribute' list with a single option: * (Map all Attributes). Below the list are 'Select All' and 'Deselect All' buttons. The 'Enter new name:' text box contains the text 'bookTitle', which is circled. At the bottom of the dialog, the 'OK' button is circled.

And how it looks when all the mapping is done...

Here's what our mapping looks like once the four field names have been added to the mapping...

Work Attribute	Assignment
bookAuthor	conn.bookAuthor
bookPublishedDate	conn.bookPublishedDate
bookRating	conn.bookRating
bookTitle	conn.bookTitle

Now, we'll configure the Data Flow Connector...



Configuring the output connector, we choose File System Connector with an AddOnly Mode since we'll be writing out to the file.

Get the actual location of the file...

Insert new object

Connector Configuration

File System Connector

Help

File Path * C:\Users\Duffbert\Desktop\bookReview.xml Select... ?

Comment ?

Detailed Log ?

Advanced

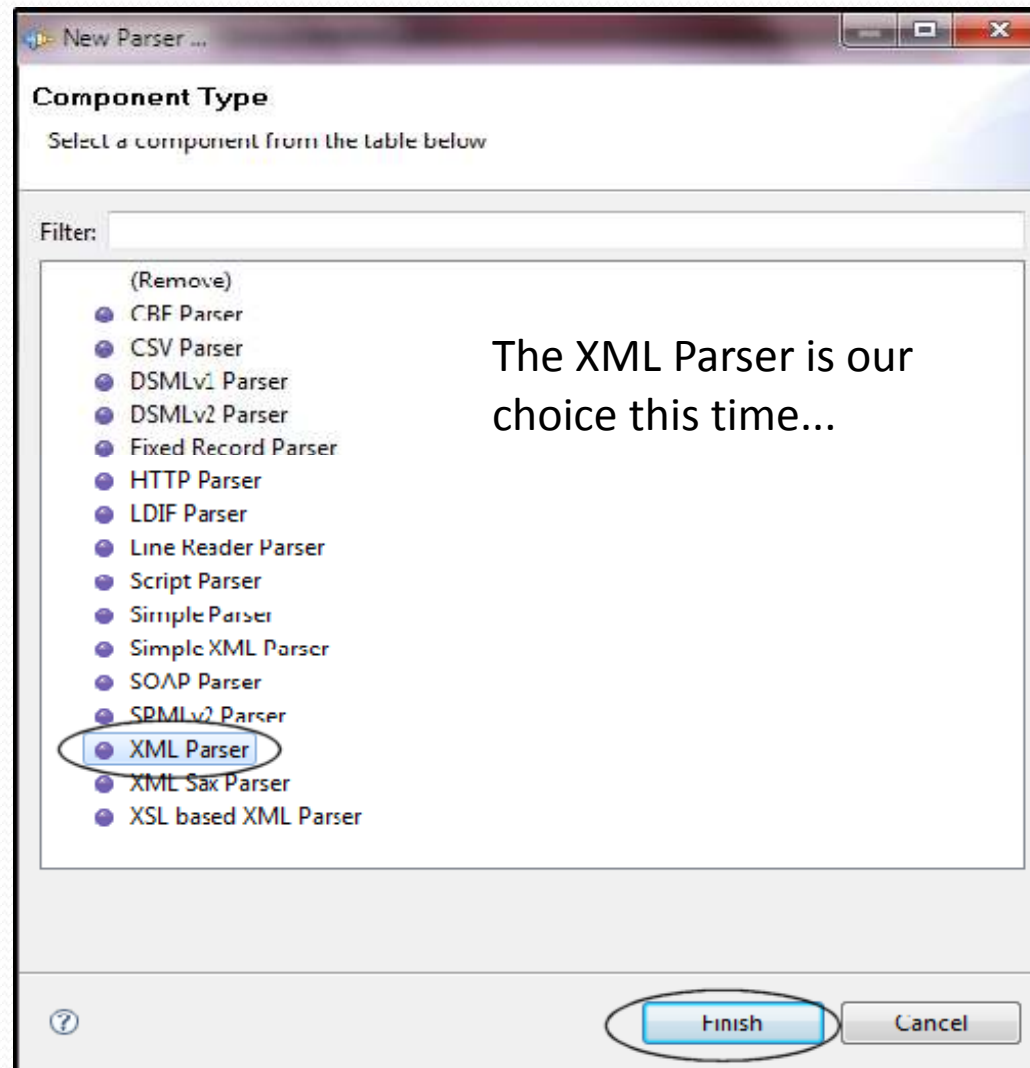
Append on Output ?

Lock file ?

< Back Next > Finish Cancel

Again, choose the output file location that you'll be writing to...

The next option selects the parser...



We have to make sure the parser is configured...

Configuring the Parser... For the sake of our example here, I'm just going to take the default entries...

Insert new object

Parser Configuration

XML Parser

Select Parser Help

Simple XPath ?

Entry Tag ?

Value Tag ?

Comment ?

Detailed Log ?

Advanced

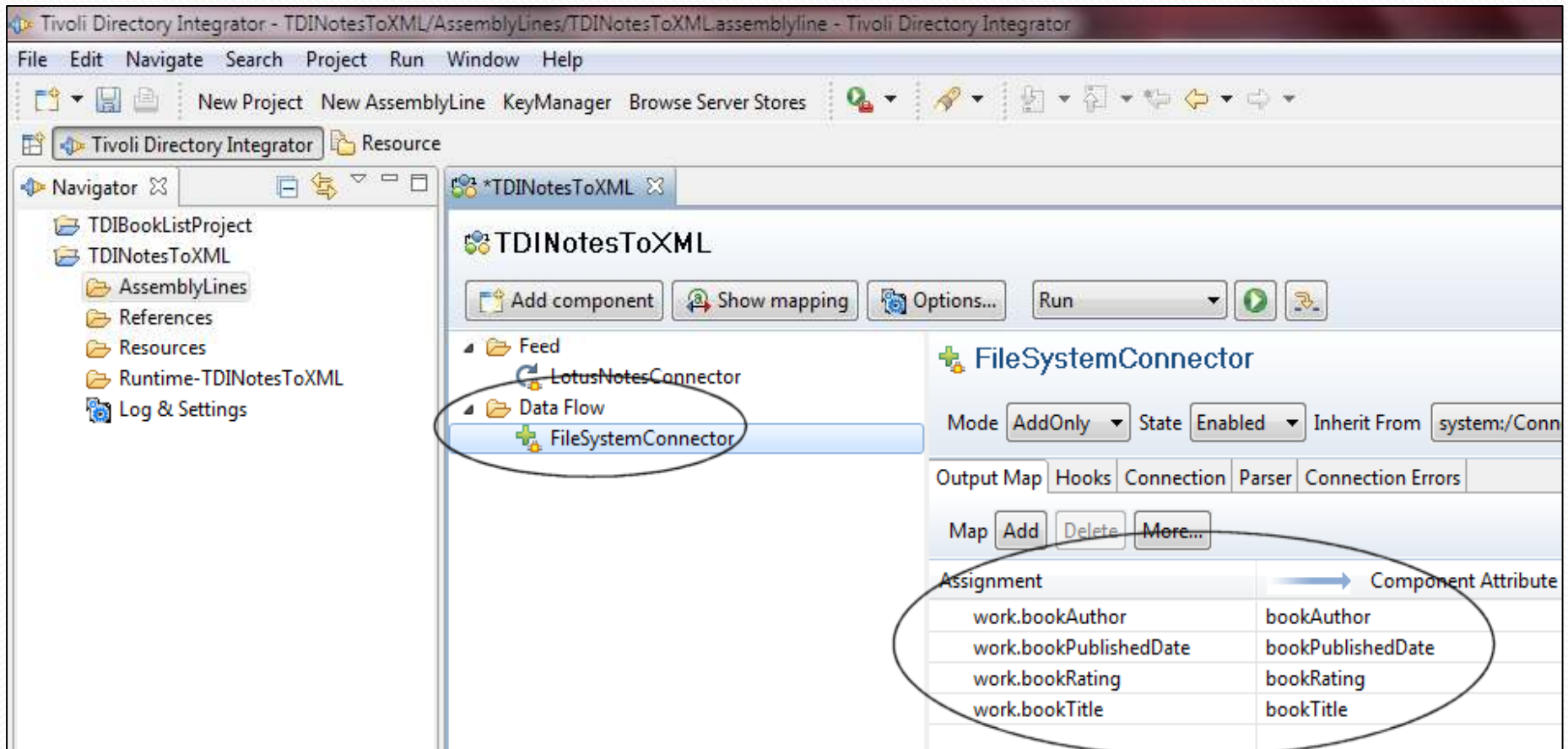
< Back Next > **Finish** Cancel

Select the fields we'll be outputting to the XML file...

The screenshot shows the TDINotesToXML application interface. On the left, a tree view shows the project structure with 'FileSystemConnector' selected under 'Data Flow'. In the center, the 'Map' button is circled. On the right, the 'Add attribute' dialog is open, displaying a list of attributes: '* (Map all Attributes)', 'bookAuthor', 'bookPublishedDate', 'bookRating', and 'bookTitle'. The 'bookAuthor' attribute is circled. At the bottom of the dialog, the 'OK' button is circled. Below the dialog, there are 'Select All' and 'Deselect All' buttons, an 'Enter new name:' text box, and a help icon.

Mapping the output fields for the FileSystemConnector. We choose from the fields we mapped in the Lotus Notes Connector mapping.

The XML connector is now configured...



The screenshot shows the Tivoli Directory Integrator interface. The main window displays the configuration for a **FileSystemConnector** within a **Data Flow** component. The connector is set to **Mode: AddOnly**, **State: Enabled**, and **Inherit From: system:/Conn**. The **Output Map** tab is active, showing a table of assignments. The table lists the following mappings:

Assignment	Component Attribute
work.bookAuthor	bookAuthor
work.bookPublishedDate	bookPublishedDate
work.bookRating	bookRating
work.bookTitle	bookTitle

With that done, we see our mapping for the FileSystemConnector. But instead of simply taking the data “as is”, we want to modify the data as it is written out.

Reformatting the author's name for output...

The screenshot shows the TDINotesToXML application interface. On the left, a 'Feed' pane lists 'LotusNotesConnector' and 'FileSystemConnector'. The main area displays a mapping table with columns 'Work Attribute', 'Assignment', and 'Component Attribute'. The 'Assignment' column for 'bookAuthor' is circled in blue, and the text 'conn.bookAuthor' is also circled in blue. Below the table, the 'Assignment' field is set to 'LotusNotesConnector.bookAuthor', which is also circled in blue. A JavaScript code editor at the bottom shows the following code:

```
temp = conn.getString("bookAuthor");
commaPos = temp.indexOf(",");
if (commaPos == -1) {
    ret.value = temp;
} else {
    ret.value = temp.substr(commaPos + 1) + " " + temp.substr(0, commaPos);
}
```

Buttons for 'Collapse', 'Expand', and 'Options...' are visible at the bottom left of the code editor.

The Assignment column shows what the data is going to be. If we click on that, we can use JavaScript to reformat the data.

Here, we are changing the name from Last, First to First Last name format. temp is the variable for the value of bookAuthor, and ret.Value returns the field modification.

Reformatting the ratings field...

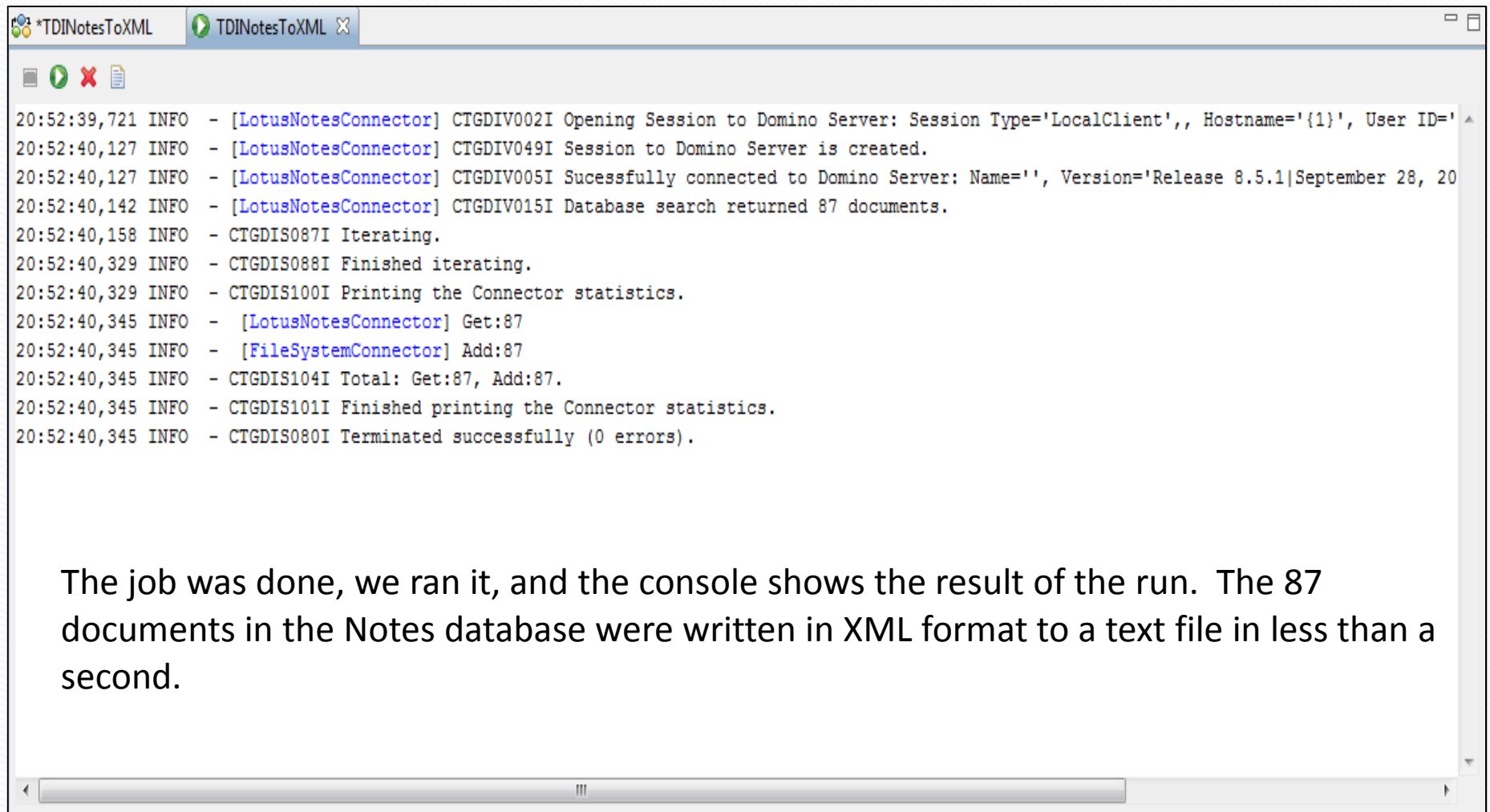
The screenshot shows the TDINotesToXML application interface. On the left, there is a 'Feed' tree with 'LotusNotesConnector' and 'Data Flow' containing 'FileSystemConnector'. The main area features a mapping table with columns 'Work Attribute', 'Assignment', and 'Component Attribute'. The 'bookRating' row is highlighted in blue, and its 'Assignment' value 'conn.bookRating' is circled. Below the table, the 'LotusNotesConnector.bookRating' path is also circled. The code editor below shows a switch statement that maps numeric ratings to descriptive phrases.

Work Attribute	Assignment	Component Attribute
LotusNotesConnector		[Source]
bookAuthor	temp = conn.getString("bookAuthor")	getString
bookPublishedDate	conn.bookPublishedDate	bookPublishedDate
bookRating	conn.bookRating	bookRating
bookTitle	conn.bookTitle	bookTitle

```
temp = conn.getString("bookRating");
switch (temp)
{
    case "1":
        ret.value = "Sucks";
        break;
    case "2":
        ret.value = "Poor";
        break;
    case "3":
        ret.value = "Average";
        break;
    case "4":
        ret.value = "Very Good";
        break;
    case "5":
        ret.value = "Excellent";
        break;
    default:
        ret.value = "Unknown";
        break;
}
```

This data reformat takes the bookRating field and turns it into a phrase that describes how I liked the book.

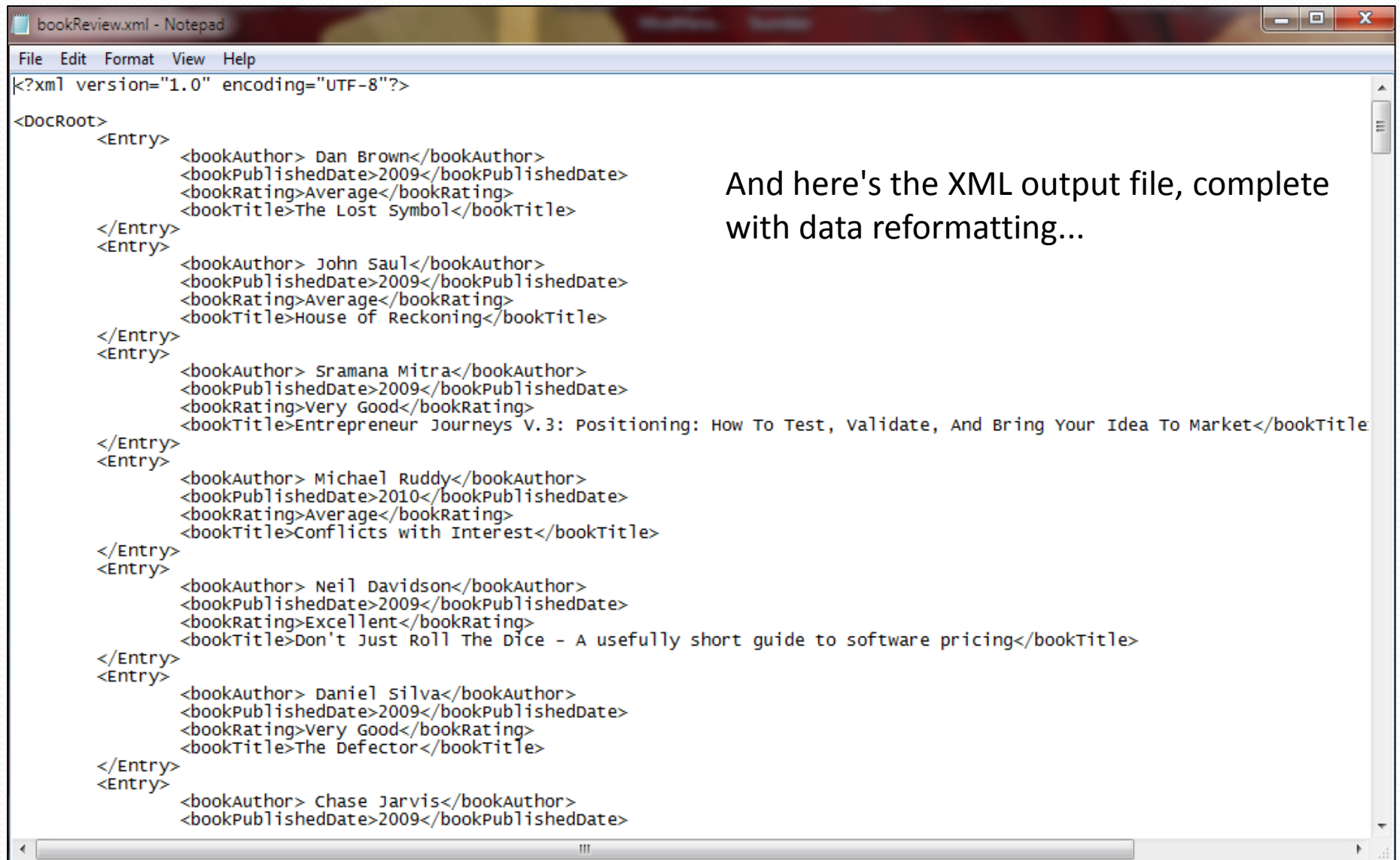
Run the job...



```
20:52:39,721 INFO - [LotusNotesConnector] CTGDIV002I Opening Session to Domino Server: Session Type='LocalClient',, Hostname='{1}', User ID=' ^
20:52:40,127 INFO - [LotusNotesConnector] CTGDIV049I Session to Domino Server is created.
20:52:40,127 INFO - [LotusNotesConnector] CTGDIV005I Sucessfully connected to Domino Server: Name='', Version='Release 8.5.1|September 28, 20
20:52:40,142 INFO - [LotusNotesConnector] CTGDIV015I Database search returned 87 documents.
20:52:40,158 INFO - CTGDIS087I Iterating.
20:52:40,329 INFO - CTGDIS088I Finished iterating.
20:52:40,329 INFO - CTGDIS100I Printing the Connector statistics.
20:52:40,345 INFO - [LotusNotesConnector] Get:87
20:52:40,345 INFO - [FileSystemConnector] Add:87
20:52:40,345 INFO - CTGDIS104I Total: Get:87, Add:87.
20:52:40,345 INFO - CTGDIS101I Finished printing the Connector statistics.
20:52:40,345 INFO - CTGDIS080I Terminated successfully (0 errors).
```

The job was done, we ran it, and the console shows the result of the run. The 87 documents in the Notes database were written in XML format to a text file in less than a second.

The output file (note the data reformatting...)



The screenshot shows a Notepad window titled "bookReview.xml - Notepad". The window contains XML code for a list of book reviews. The XML structure is as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<DocRoot>
  <Entry>
    <bookAuthor> Dan Brown</bookAuthor>
    <bookPublishedDate>2009</bookPublishedDate>
    <bookRating>Average</bookRating>
    <bookTitle>The Lost Symbol</bookTitle>
  </Entry>
  <Entry>
    <bookAuthor> John Saul</bookAuthor>
    <bookPublishedDate>2009</bookPublishedDate>
    <bookRating>Average</bookRating>
    <bookTitle>House of Reckoning</bookTitle>
  </Entry>
  <Entry>
    <bookAuthor> Sramana Mitra</bookAuthor>
    <bookPublishedDate>2009</bookPublishedDate>
    <bookRating>Very Good</bookRating>
    <bookTitle>Entrepreneur Journeys V.3: Positioning: How To Test, Validate, And Bring Your Idea To Market</bookTitle>
  </Entry>
  <Entry>
    <bookAuthor> Michael Ruddy</bookAuthor>
    <bookPublishedDate>2010</bookPublishedDate>
    <bookRating>Average</bookRating>
    <bookTitle>Conflicts with Interest</bookTitle>
  </Entry>
  <Entry>
    <bookAuthor> Neil Davidson</bookAuthor>
    <bookPublishedDate>2009</bookPublishedDate>
    <bookRating>Excellent</bookRating>
    <bookTitle>Don't Just Roll The Dice - A usefully short guide to software pricing</bookTitle>
  </Entry>
  <Entry>
    <bookAuthor> Daniel Silva</bookAuthor>
    <bookPublishedDate>2009</bookPublishedDate>
    <bookRating>Very Good</bookRating>
    <bookTitle>The Defector</bookTitle>
  </Entry>
  <Entry>
    <bookAuthor> Chase Jarvis</bookAuthor>
    <bookPublishedDate>2009</bookPublishedDate>
```

And here's the XML output file, complete with data reformatting...



Other possible scenarios!

- Other uses with Notes databases (we think you developers might like)
 - Connect to SQL db (or other relational db) to update Domino web page or database (scheduled or event driven)
 - Notes db to Notes db (one time event)
 - SAP or Peoplesoft connectors



Additional Resources

- **IBM Tivoli Directory Integrator Users Group** - <http://www.tdi-users.org>
- **Domino Integration Specific Info:** <http://sites.google.com/site/dominointegration>
- **IBM DeveloperWorks – Tivoli** - <https://www.ibm.com/developerworks/tivoli/>
- **TDI User Forum** - <http://groups.google.com/group/ibm.software.network.directory-integrator/topics?gvc=2>
- **Learning TDI** - <http://www.tdi-users.org/twiki/bin/view/Integrator/LearningTDI>
- **Domino Integration with TDI** - <http://www.tdi-users.org/twiki/bin/view/Integrator/Domino>
- **TDI Redbooks/Redpieces –**
<http://www.redbooks.ibm.com/cgi-bin/searchsite.cgi?query=tivoli+AND+directory+AND+integrator>
- **And Marie and Tom have done a series of TDI articles on at:**
<http://www.bleedyellow.com/blogs/crashtestchix>
- **Thanks to Eddie Hartman “TDI Story Teller”** eddie.hartman@no.ibm.com



Tune in for more TDI

- Want to find out more about TDI from a Domino administrator's perspective?
- Want to learn more about TDI and directories?
- Or do you just want to learn some more about TDI?
- Join us for our next session – TDI – The Best Free Tool You've Never Heard Of (The Administrator's Perspective) on May 19
- <http://consultantinyourpocket.com/ciyp/ciyp.nsf/dx/tivoli-directory-integrator-the-best-free-tool-youve-never-heard-of-administrators-perspective.htm>

Questions? Comments?



Marie Scott – mlscott@vcu.edu

Blog: CrashTestChix -

<http://www.bleedyellow.com/blogs/crashtestchix>

Twitter: [marie_scott](https://twitter.com/marie_scott)

Thomas “Duffbert” Duff - duffbert@gmail.com

Blog: Duffbert's Random Musings - <http://www.duffbert.com>

Twitter: [duffbert](https://twitter.com/duffbert)