Captiva InputAccel 6.5 Tutorial

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1 Introduction

I recently developed and deployed a Captiva InputAccel v6.5 solution for a customer. Prior to this project, I had never had any exposure to InputAccel, but figured "how hard could it be?". Well, it turned out to be much harder -- and simpler -- than I expected. Let me explain.

Here's why it was harder:

- First, there is virtually zero information on the Internet or the EDN about how to setup and develop a solution using InputAccel. One good website I found, EMCCaptiva.net, was all about version 5.3 of InputAccel. InputAccel went through a major redesign with version 6, so not much of this website was relevant.
- The documentation that comes with InputAccel can be overwhelming. Much of the documentation is contained in hyperlinked Windows help files and, at least to my mind, doesn't provide enough context or flow to function as a tutorial.
- There are at least five different ways to configure and deploy InputAccel discussed in the installation documentation. However, the discussions are all predicated upon you knowing something about InputAccel and don't offer any best practices or rules of thumb to get you started.
- The CaptureFlow Designer, the new GUI design tool that was released with InputAccel version 6.0 has no documentation, though it does have online help and some sample processes that are helpful. Because this tool is so new, no one on the Internet or EDN professed knowledge of how to use it either.
- Any process built in Process Developer (the previous InputAccel process development tool) is not compatible with CaptureFlow Designer. This means there is no way to reverse-engineer an existing process into the new tool for learning purposes.
- There is not a unified debugging environment. Tracking down an error or root cause of a failed process step requires checking several logs and servers.
- And last, much of the "development" of an InputAccel process is configuration of the modules. However, most of this configuration is hidden and not obvious. There is also no unified development/configuration environment, so I was continually bouncing around among the various modules to get the process configured and running.

Here's why developing, configuring and deploying an InputAccel solution was easier than I expected (the caveat being: "once I figured it out"):

- First, the CaptureFlow Designer GUI tool is easy to use once you get the hang of it. You simply drag modules from a pallet onto a workspace and connect them to form your process. Hopefully future versions of the tool will continue to refine its function and expand its capabilities (e.g., better error handling, better custom variable configuration, direct access to module setup, etc.).

- The InputAccel modules are really powerful, and with a few clicks, can be configured to take care of most of your needs. It is obvious that a lot of thought has gone into these modules and their capabilities.
- Once I understood where a problem occurred or a tweak needed to be made, it was simple to make the necessary corrections with just a few clicks of the mouse.
- Finally, I didn't have to do any real programming per se to get my process built. I did use some built-in functions and variables though, to manipulate the data I was interested in collecting.

The purpose of this paper is to describe the simple process I designed and implemented using CaptureFlow Designer, various InputAccel modules, and the InputAccel Administration Console. I have tried to capture the "gotchas" I encountered and tips for avoiding them or remedying them, and advice given to me by seasoned InputAccel developers. My hope is that someone will benefit from this narrative.

The remainder of this document is structured as follows:

- The remaining subsections in this section discuss the business process I needed to implement and the architecture of my InputAccel environment.
- Section 2 discusses the CaptureFlow Designer GUI tool and how I implemented the process described in section 1.1. It touches on the two major functions of the tool: process flow design and custom variables.
- Section 3 discusses how to complete the implementation of the process by configuring (referred to as "setting up") each of the InputAccel modules.
- Section 4 covers how to test and debug your process once it has been compiled and installed.
- Section 5 contains the conclusion of my InputAccel experience.

1.1 Process Overview

The business process I needed to implement was fairly simple. A handful of users scan black and white documents (correspondence) at their desks, provide basic index information, and save the documents to a content management system (Documentum). The capture process needed to create an OCR version of the document, convert it to PDF, update an external database, and store the document in a particular folder hierarchy in the content management system.

Figure 1 depicts my capture process.

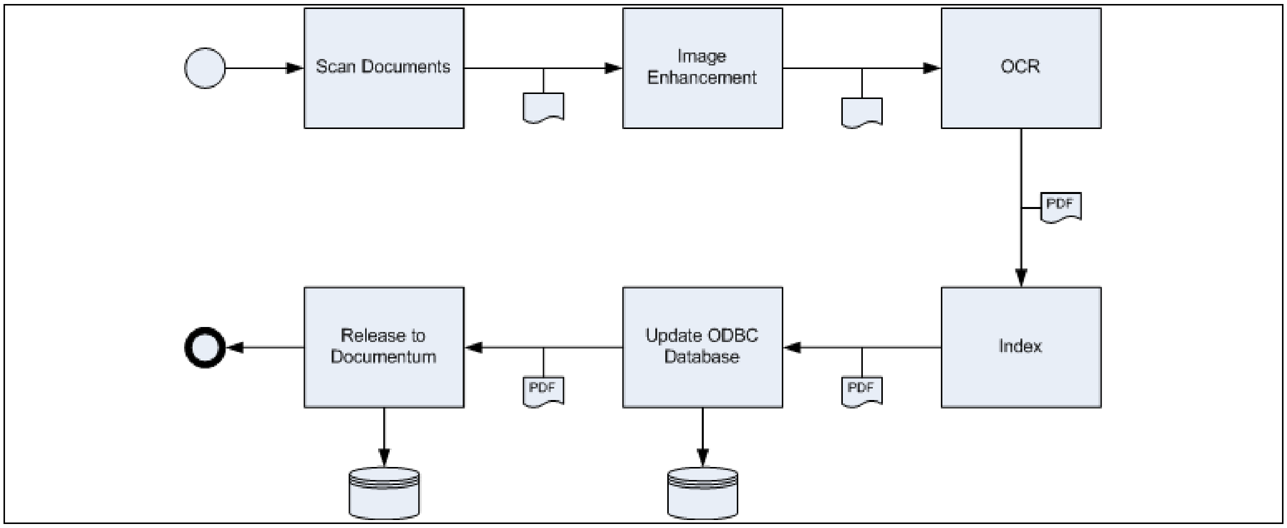


Figure 1 Scanning Process

One note to make here: the users were used to scanning and indexing their own documents. This setup is a little different from how InputAccel usually works. Usually, the tasks in an InputAccel process are executed by different people in more of a pipeline paradigm. For example, scanner operators do nothing but scan documents and make sure the quality is acceptable. Once they release the document, it flows to a QA person who applies image enhancement filters and techniques to improve the quality of the documents. QA releases the document to someone who reads the document and applies the indexing metadata, etc.

In my process, a single person performs both the scanning and indexing. All of the other tasks are automated. The result of this configuration is that when users apply indexing metadata to their documents, they see all the other users' documents in the IndexPlus module's queue. For my customer this was okay, but it is not the normal implementation of InputAccel.

In addition, there is a branch in the logic I have not depicted here, but will discuss in Section 2.1. During the Indexing step, if the user fails to enter a 'Case Number', the 'Update ODBC Database' step is skipped.

1.2 Architecture Overview

Figure 2 contains the hardware architecture for my solution.

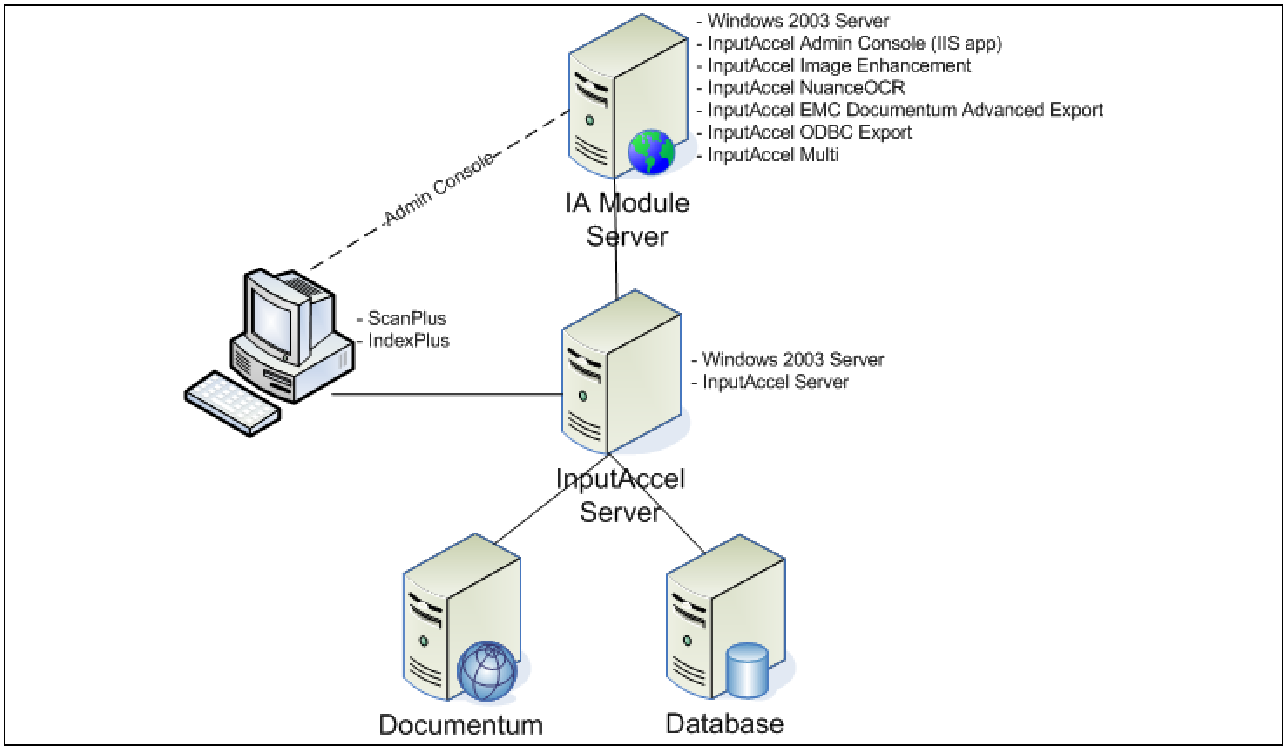


Figure 2 My InputAccel Architecture

A few notes about this architecture:

- Depending upon the size of the scanned documents and the configurations in place, OCRing and automatic image enhancement running on the same computer could be a process bottleneck. For high volume and/or large documents, these processes should be run on separate servers or workstations.
- As previously noted in Section 1.1, the scanning task and the indexing task should be performed by different users, and therefore, the scanning and indexing software would usually reside on different workstations.

2 CaptureFlow Designer

CaptureFlow Designer is InputAccel's (IA) new GUI-based, process development tool. It replaces the Process Builder tool, though Process Builder is still shipped with InputAccel and still works perfectly fine.

2.1 Process Design

Figure 3 depicts my interpretation of the scanning process discussed Section 1.1.

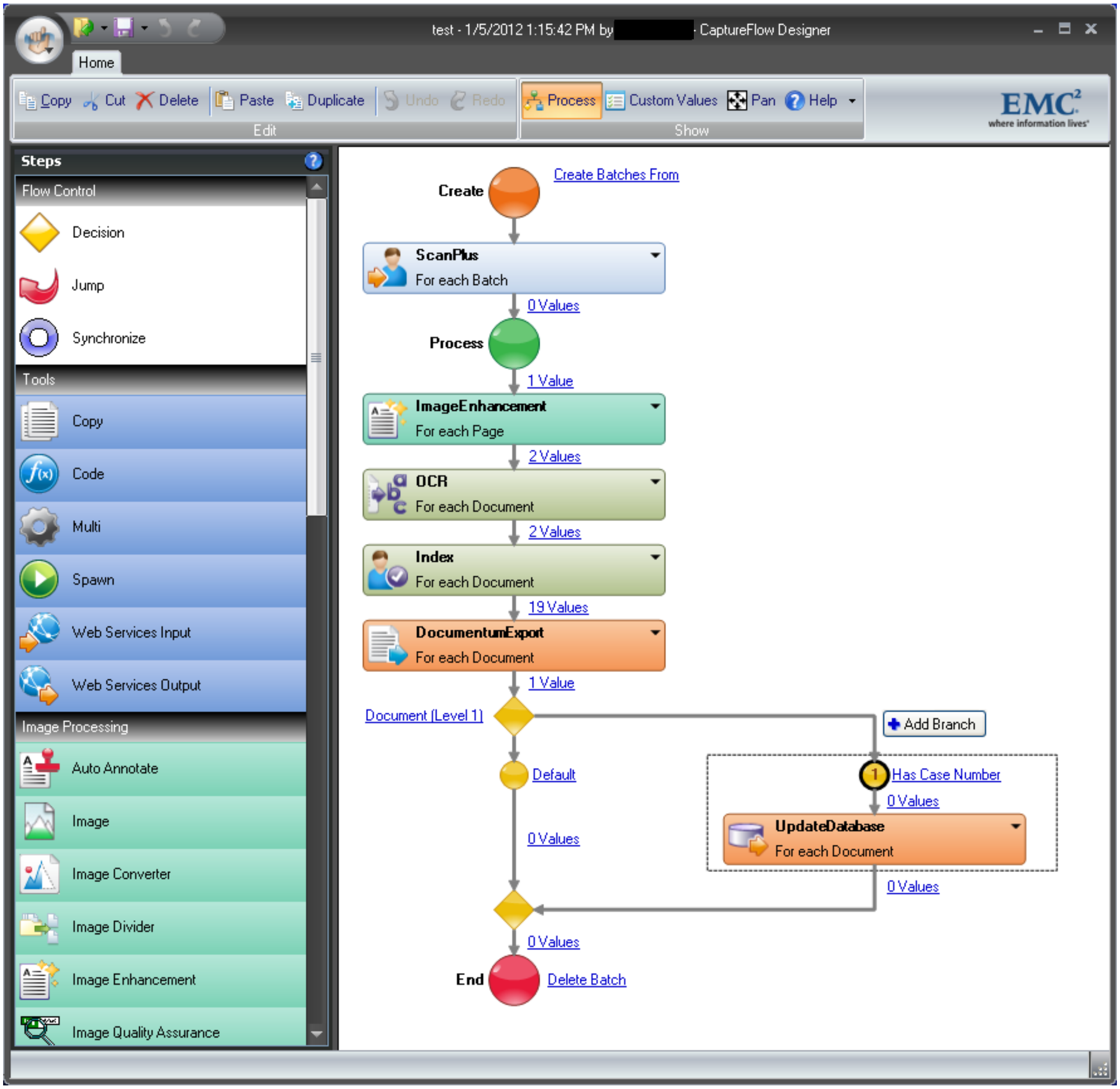


Figure 3 CaptureFlow Manager

When you create a new process in CaptureFlow Designer, you are presented with a short, default process already defined. This default process consists of a **Create** node, a **ScanPlus** step, a **Process** node, and an **End** node. To build a process, you simply drag steps from the pallet on the left, onto the canvas on the right, somewhere between the **Process** and **End** nodes. CaptureFlow Designer keeps the diagram looking neat by automatically sliding steps and nodes to accommodate additions and deletions to the process.

Once all the steps of your process are in place and in the right order, right-click on each one to rename them. The name you give each step here will be the name used later by the InputAccel server while processing documents.

In addition to naming your steps, you must also indicate at what level each step is triggered. You do this by right-clicking each step and choosing the **Level** option. Your choices of trigger level vary by step, but are generally between 0 and 7. Essentially you are telling each step what level in the stack of scanned pages each operation should occur. For example, documents are scanned and released to the InputAccel server in batches. Image enhancement is applied to each page in the batch. Indexing occurs on a per-document basis. See the Captiva InputAccel document, *System Overview: The Basics of InputAccel*, for a good description of what these trigger levels are and what they do.

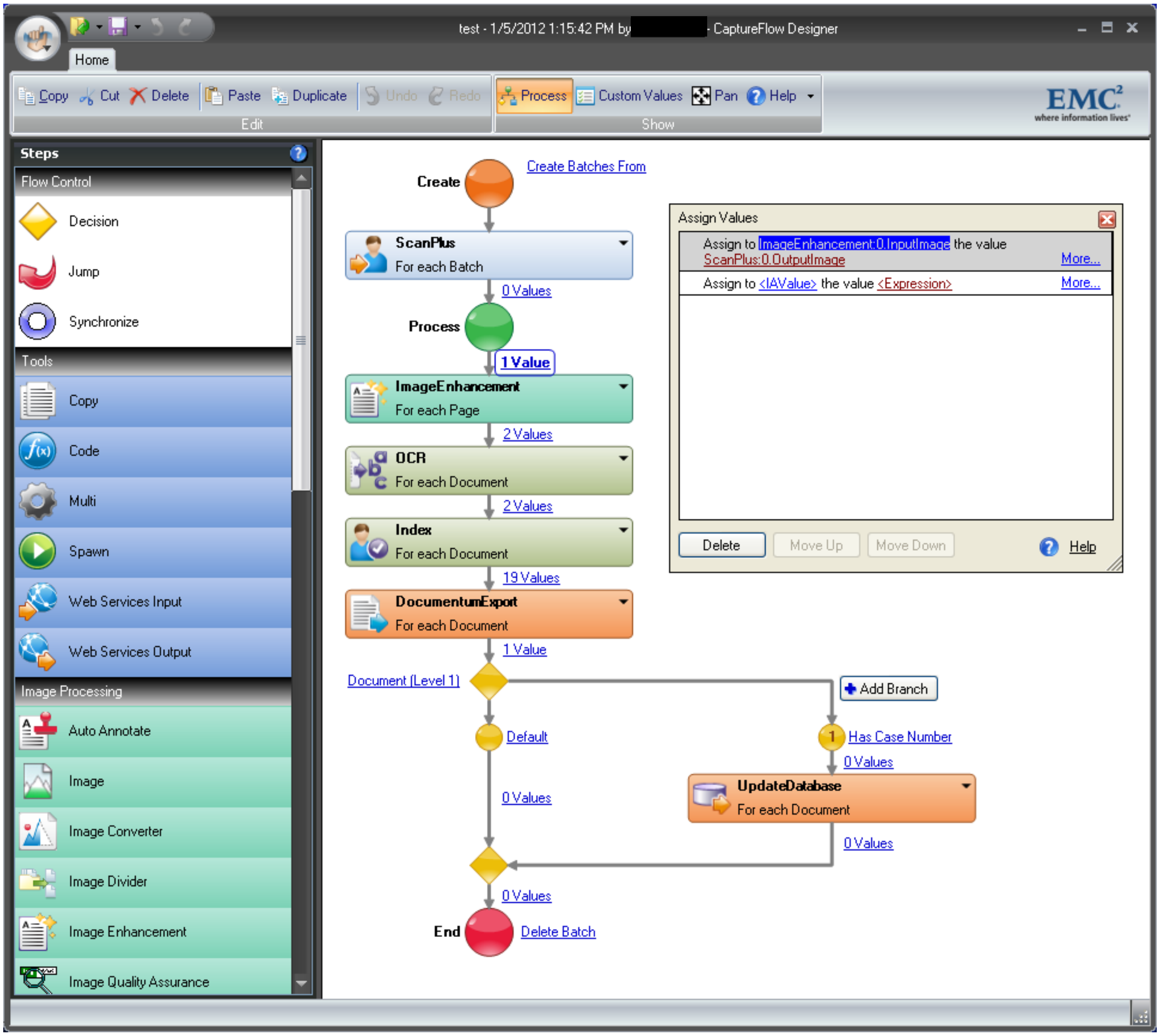
For my process, I set the following levels:

IA Step	Level
ScanPlus	Batch (Level 7)
ImageEnhancement	Page (Level 0)
OCR	Document (Level 1)
Index	Document (Level 1)
DocumentumExport	Document (Level 1)
UpdateDatabase	Document (Level 1)
End	Delete Batch

2.2 IA Values and Custom Values

You probably noticed that between each of the steps and nodes there are hyperlinks named **0 Values**. Clicking these hyperlinks opens the **Assign Values** window (see Figure 4). This is where you assign what data and content is passed from one step to the next in your process. These assignments are critical. If you don't pass the right information from one step to the next, the succeeding step may not have enough information to execute properly, or it may not be triggered at all.

When you insert steps into the CaptureFlow Designer process, some of these variables are defined for you. For example, when you inserted the **ImageEnhancement** step after the **Process** node, CaptureFlow Designer automatically assigned `ImageEnhancment:0.ImageInput = ScanPlus:0.OutputImage`. This assignment passes the scanned pages from the **ScanPlus** step to the **ImageEnhancement** step. Without this assignment, the **ImageEnhancement** step would never trigger.



test - 1/5/2012 1:15:42 PM by [redacted] - CaptureFlow Designer

Assign Values

Assign to ImageEnhancement:0.InputImage the value ScanPlus:0.OutputImage More...

Assign to <IAValue> the value <Expression> More...

Figure 4 CaptureFlow Designer with Assign Value Window

2.2.1 IA Values

InputAccel has hundreds of pre-defined variables that can contain or receive values throughout the process. These pre-defined values are called “IA Values”, and just like steps, they exist and operate at different levels. You can find descriptions of many of these variables by clicking the **Help** button in the CaptureFlow Designer tool bar, and searching on “IA Values”.

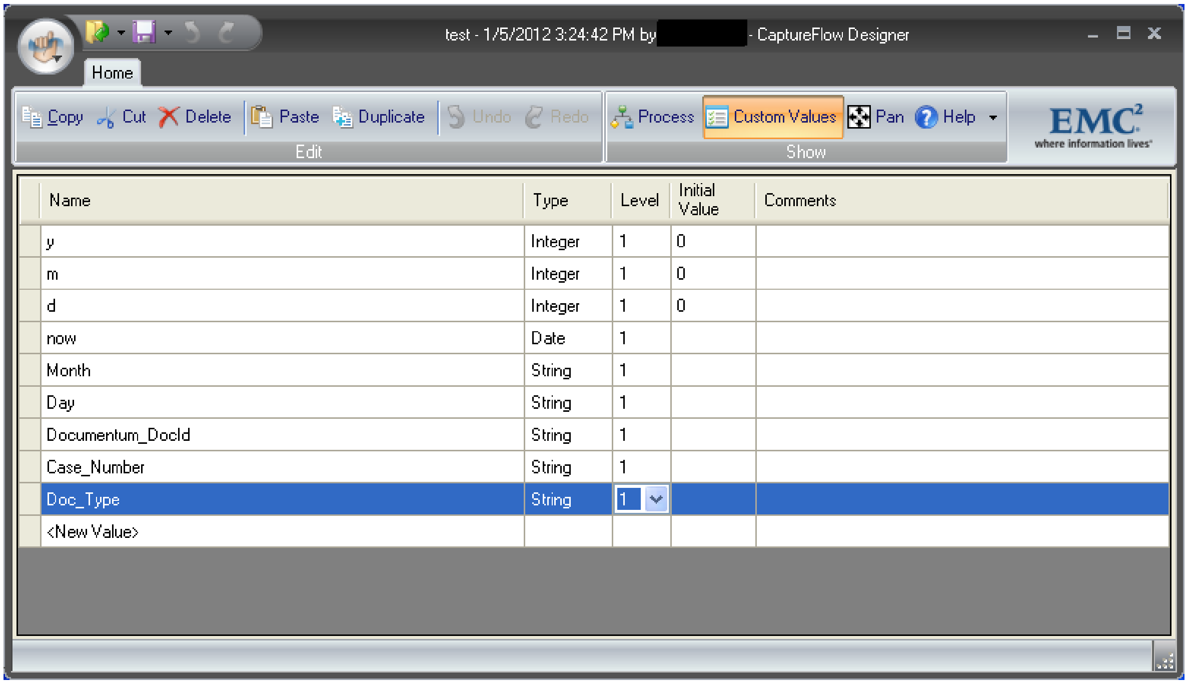
When you click the **<IA Value>** link on the **Assign to** line in the **Assign Values** window, the assignment window expands and the autocomplete feature engages to display the names of all of the steps in your process. Simply select the step that contains the IA value you would like to set. Next, you will be presented with a numbered list, 0 – 7. These represent the trigger levels at which the IA values are defined. Select a level and autocomplete will display a list of all available IA values at that level. Choose a value and click **OK** to close the assignment window.

Next, click the **<Expression>** link next to the **<IA Value>** you just created. The assignment window will open but the autocomplete feature does not automatically engage. This is because you can assign hard coded literals to IA Values by just entering the values here. If you want to use autocomplete to assign an IA Value from another step, just start typing and it will begin displaying options.

Once you have completed an assignment, you will notice a **More…** link on the right side of the **Assign Values** window for the assignment you just made. If you click on the **More…** link, the assignment window will expand to display some options for applying conditions to your assignment. Note that the condition must evaluate to `TRUE` or `FALSE`.

2.2.2 Custom Values

In addition to IA Values, you can create custom values (i.e., custom variables) that can be assigned to and manipulated just like IA Values. To create a custom value, click the **Custom Value** button in CaptureFlow Designer's tool bar. The custom value definition window will be opened (see Figure 5).


test - 1/5/2012 3:24:42 PM by [redacted] - CaptureFlow Designer

Name	Type	Level	Initial Value	Comments
y	Integer	1	0	
m	Integer	1	0	
d	Integer	1	0	
now	Date	1		
Month	String	1		
Day	String	1		
Documentum_DocId	String	1		
Case_Number	String	1		
Doc_Type	String	1		
<New Value>				

Figure 5 Custom Value Definition Window

Simply define the variables you will need in your process. These variables will be available for assignment in the **Assign Values** window, the same as IA Values. Note that the **Level** column assigns these variables to a trigger level of the process, the same as the levels discussed in Section 2.1.

2.2.3 My Assignments

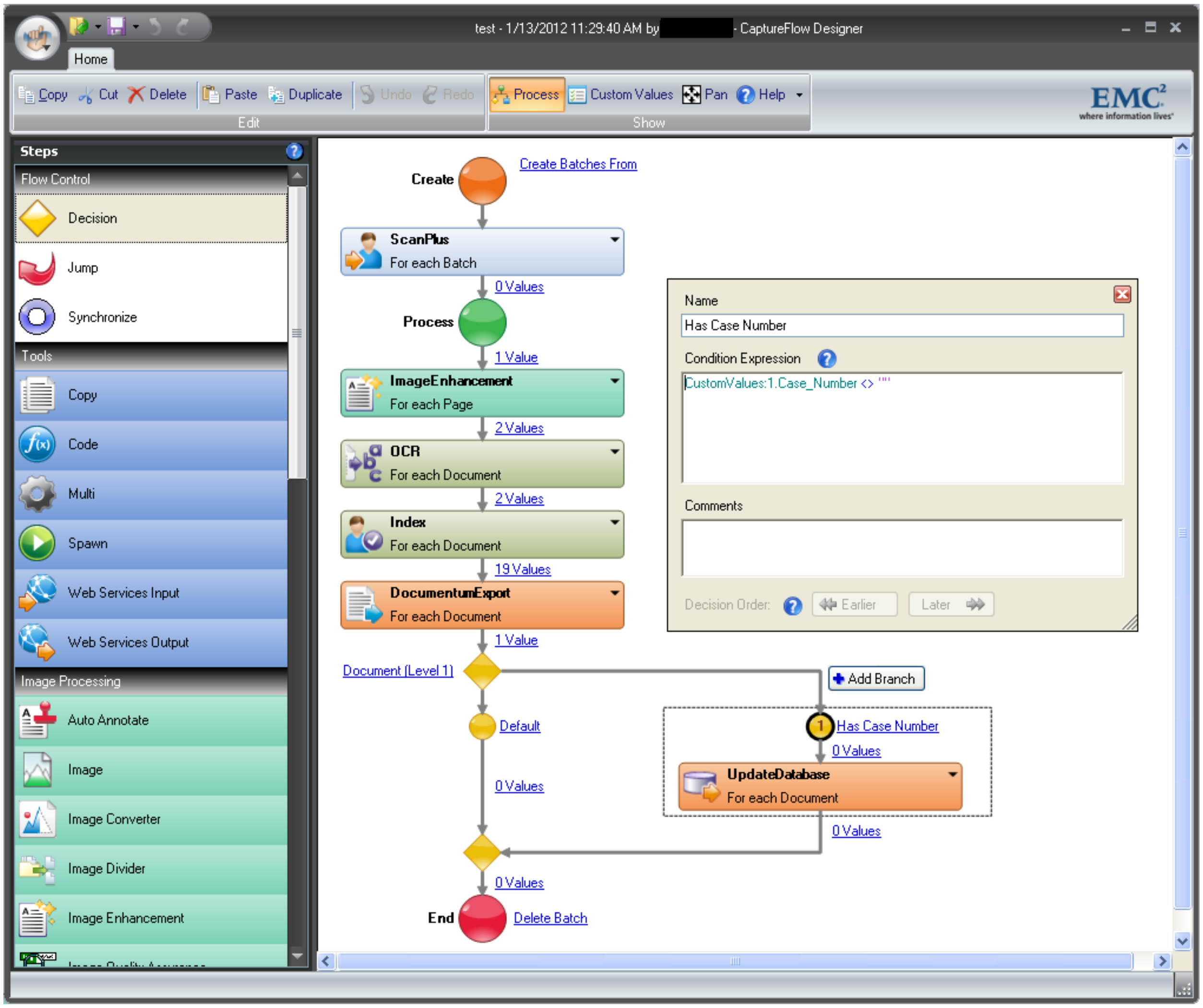
The key assignments I made in my process to pass content and data from one step to the next using the IA Values and Custom Values are:

Where Assignment Occurs	Assignment	Remarks
ScanPlus – ImageEnhancement	`ImageEnhancement:0.InputImage = ScanPlus:0.OutputImage`	Send each page from the scanner to the image enhancement module.
ImageEnhancement – OCR	`CustomValues:1.Case_Number = ImageEnhancement:0.BarText0`	Assign the first barcode the image enhancement module encounters to the customer variable “Case_Number”. (More about barcode recognition in Section 3.2).
ImageEnhancement – OCR	`OCR:0.Level0_InputImage = ImageEnhancement:0.OutputImage`	Send each page to be OCRed. The OCR module is configured to operate at the Document level (Level 1), so it won’t trigger until all of the pages of the document have been received.
OCR – Index	`Index:0.InputImage = ImageEnhancement:0.OutputImage`	Send each image enhanced page to the index step.
Index – DocumentumExport	`DocumentumExport:1.InputFile1 = OCR:1.OutputFile1_OutputFile`	Send the OCRed PDF generated in the OCR step to the Documentum Export step to be exported to Documentum.
DocumentumExport – UpdateDatabase	`CustomValues:1.now = Now()`	Get the current date and assign it to the custom value “now”.
DocumentumExport – UpdateDatabase	`CustomValues:1.y = GetDatePart(CustomValues:1.now,0)`	Get the year part of the date.
DocumentumExport – UpdateDatabase	`CustomValues:1.m = GetDatePart(CustomValues:1.now,1)`	Get the month part of the date.
DocumentumExport – UpdateDatabase	`CustomValues:1.d = GetDatePart(CustomValues:1.now,2)`	Get the day of the month part of the date.
DocumentumExport – UpdateDatabase	`CustomValues:1.Month = “Jan” if (CustomValues:1.m = 1) is True`	If the custom value m is equal to 1, assign the value “Jan” to the custom value Month. This logic is repeated 11 more times, once for each month.
DocumentumExport – UpdateDatabase	`CustomValues:1.Day = CustomValues:1.d`	Set the Day custom value equal to the custom value d.
DocumentumExport – UpdateDatabase	`CustomValues:1.Day = “0” & CustomValues:1.d if (CustomValues:1.d < 10)`	Pad the Day custom value with a “0” if the day of the month is less than 10.
DocumentumExport – UpdateDatabase	`CustomValues:1.Documentum_DocId = DocumentumExport:0. Level0_ObjectId`	Capture the r_object_id from Documentum for the newly imported document.
Index Module	`CustomValues:1.Case_Number`	Case Number entered in the Index Module.
Index Module	`CustomValues:1.Doc_Type`	The type of document this scan is: letter, memo, request, response.

Note that with value assignments you can do some pseudo-programming using built-in functions. For example, you can assign the current date and time to a variable using the `Now()` function. See the *CaptureFlow Designer Guide Programming Reference* (part of online help) for a list of all the functions available. You can also write custom functions and routines in VBA that can affect these variables. To do this, you must save your process as an IPP file (see Section 2.4) and load it into InputAccel's legacy development tool, Process Builder (not covered in this tutorial). Once you have done this, you **cannot** re-open your process in CaptureFlow Designer; the two editors are not compatible.

2.3 Branching

Creating a branch, or an if-then decision, in your process is easy. Simply drag the **Decision** node from the CaptureFlow Designer **Steps** pallet into your process (see Figure 6). The interesting part of the branch is setting up the condition to cause the branch to execute.



test - 1/13/2012 11:29:40 AM by [redacted] - CaptureFlow Designer

Name: Has Case Number

Condition Expression: CustomValues:1.Case_Number <> ""

Comments:

Figure 6 Custom Value Definition Window

To enter the condition that will cause the branch to execute, click the **Condition1** link. This will open the **Condition Editor**. Give the condition a name (this will appear on the process diagram) and then enter a conditional expression that evaluates to `TRUE`. Whenever this condition is evaluated to `TRUE`, the branch is executed. Otherwise, the default path is taken.

In my example, I created a condition called "Has Case Number" with an expression: `CustomValues:1.Case_Number <> ""`. So, when the process gets to the branch node, the InputAccel server will look to see if the Custom Value `Case_Number` has a value. (This value will be entered in the indexing step discussed later in Section 3.4.) If it does, then the branch is executed. Otherwise, the branch is ignored.

2.4 Compiling

When you save your process in CaptureFlow Designer, the file you create is an XPP file. To prepare the process for deployment to the InputAccel server, compile the process by selecting **Compile** from the CaptureFlow Designer Quick Access Toolbar. Compiling your process will create an IAP and IPP file. Either of which can be deployed to the InputAccel server (see Section 2.5).

Note that IPP files can be loaded into Process Builder, InputAccel's legacy design tool. Loading an IPP file in Process Builder will reveal all of the code CaptureFlow Designer auto-generated for you. However, any changes you make to the process in Process Builder, cannot be loaded into CaptureFlow Designer.

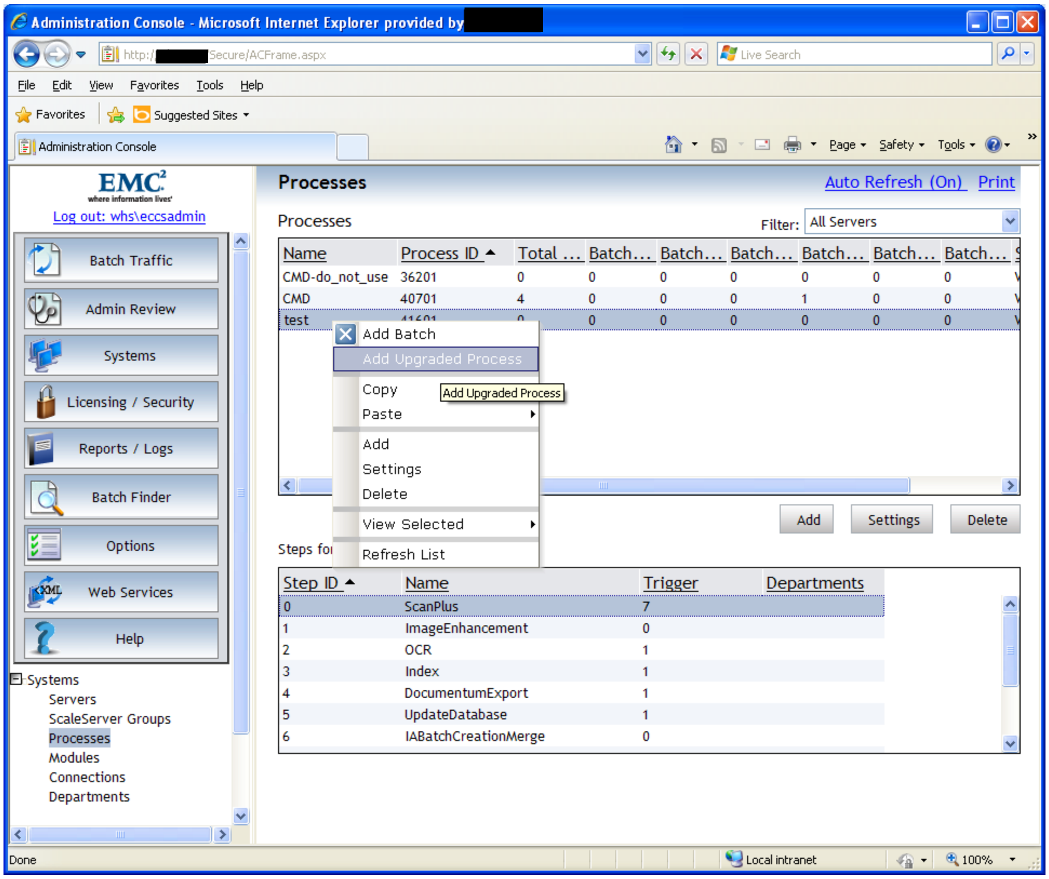
2.5 Installing the Process

After you have designed your capture process, defined all the custom variables you need, and compiled the process, it is time to install the process on the InputAccel server.

2.5.1 Installation

Unlike the Process Builder tool which allowed you to install your compiled process directly from the development environment, CaptureFlow Designer has no such capability. To install a CaptureFlow Designer process, you need to logon to the InputAccel Administration Console and manually add the process. See the online *Captiva Administration Guide* for details pertaining to this procedure.

Once a process is installed on the InputAccel server, you can update it by right-clicking on it and choosing **Add Upgraded Process** from the context menu (see Figure 7). A major caveat here is that you can only upgrade processes that have not had steps added, deleted or rearranged. Otherwise, this procedure will create a new process on the InputAccel server for you, instead of updating the selected process. Processes with changed IA Value expressions or new/deleted Custom Values upgrade with no problem; just don't change the steps once they are defined and installed. If the steps in your process change, you can copy the module settings from one process to another. See Section 2.5.2.



Name	Process ID	Total …	Batch…	Batch…	Batch…	Batch…	Batch…	Batch…
CMD-do_not_use	36201	0	0	0	0	0	0	0
CMD	40701	4	0	0	0	1	0	0
test	41601	0	0	0	0	0	0	0

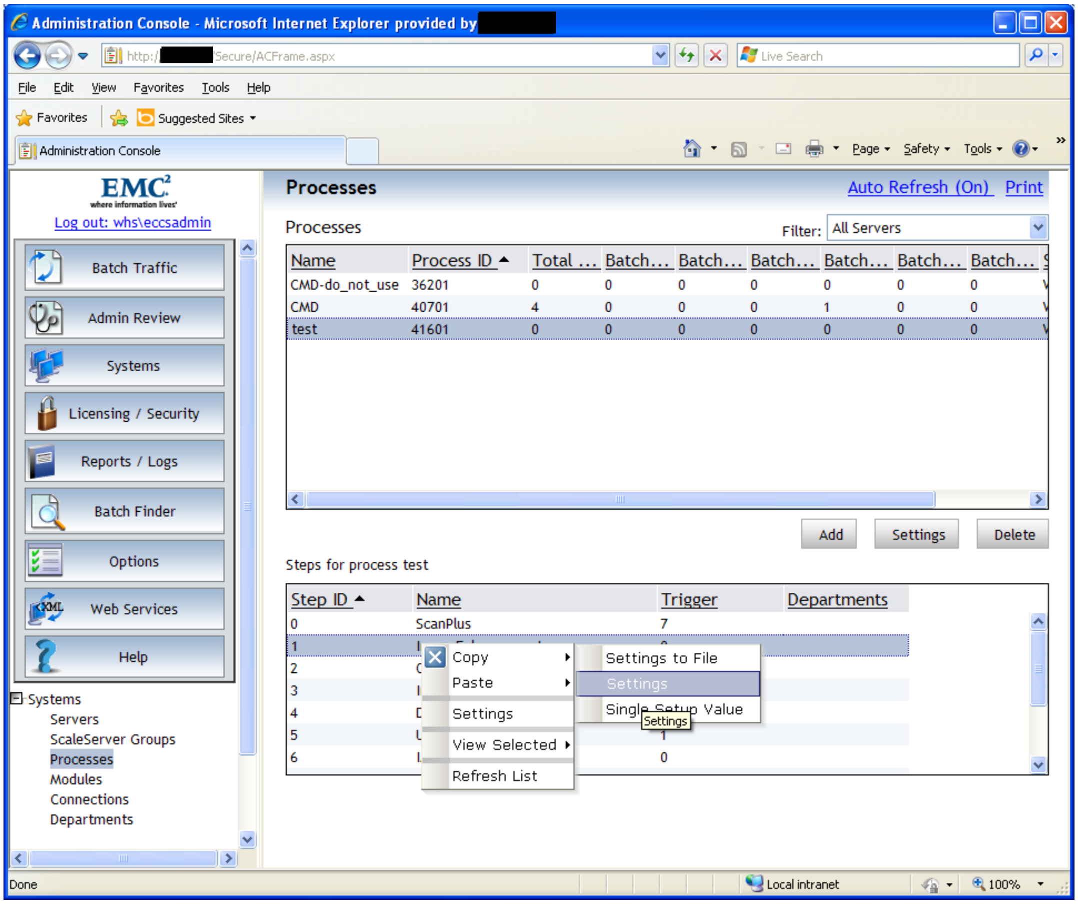
Step ID	Name	Trigger	Departments
0	ScanPlus	7	
1	ImageEnhancement	0	
2	OCR	1	
3	Index	1	
4	DocumentumExport	1	
5	UpdateDatabase	1	
6	IABatchCreationMerge	0	

Figure 7 InputAccel Admin Console, Add Upgraded Process

2.5.2 Copy and Paste Settings

The problem with installing a process as a new process or having the InputAccel server do it for you is that you lose all of your module configurations (see Section 3). If this happens, it is possible to copy and paste your module settings from one process to another. To do this, select the old process in the InputAccel Administration Console's **Processes** window, then right-click on the step in the **Step** window below it. Choose **Copy -> Settings**. Then select the new process, select the corresponding step, right-click and choose **Paste -> Settings** (see Figure 8).

The copy/paste feature is a huge time saver. You will have a much greater appreciation for it after reading the configurations performed on each module discussed in Section 3.



Processes

Processes

Name	Process ID	Total …	Batch…	Batch…	Batch…	Batch…	Batch…	Batch…
CMD-do_not_use	36201	0	0	0	0	0	0	0
CMD	40701	4	0	0	0	1	0	0
test	41601	0	0	0	0	0	0	0

Steps for process test

Step ID	Name	Trigger	Departments
0	ScanPlus	7	
1	I		
2	C		
3	I		
4	D		
5	U	1	
6	I	0	

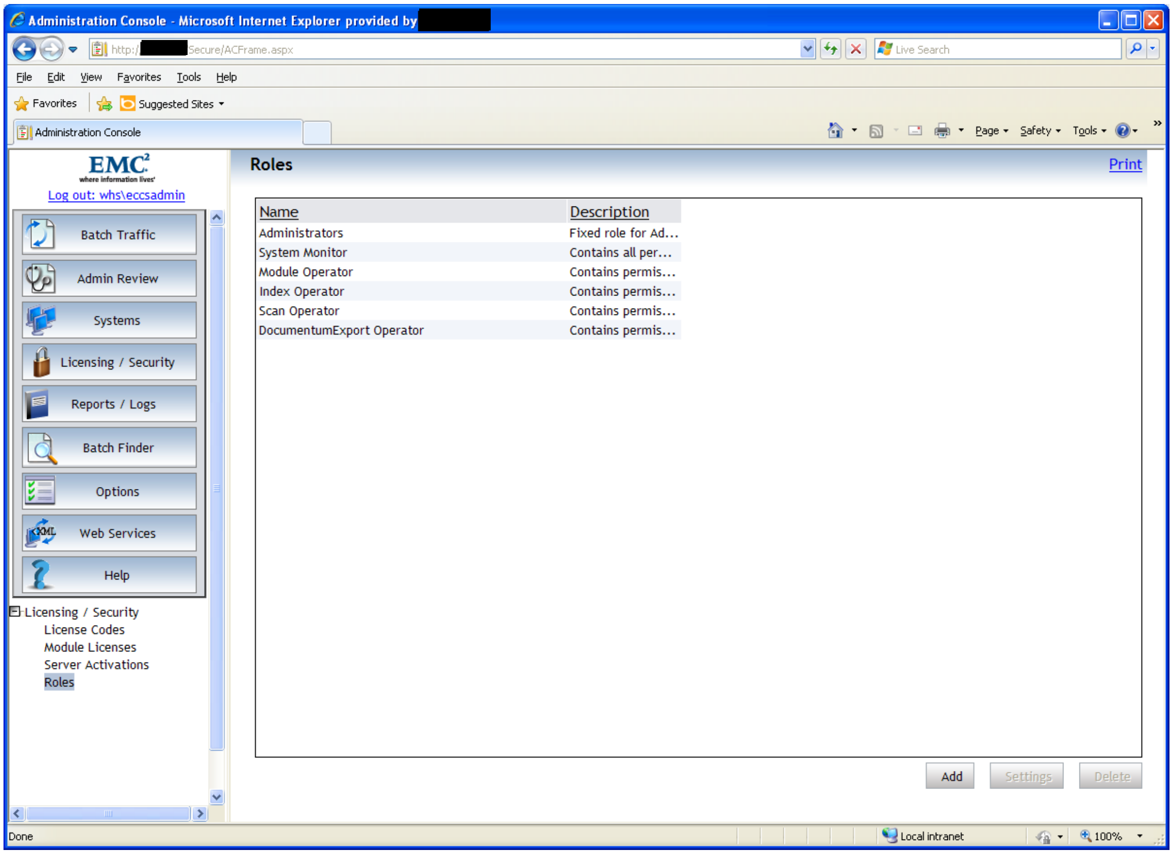
Figure 8 InputAccel Admin Console, Copy Settings

2.6 *User Roles and Security*

After installing your process on the InputAccel server, you may want to take some time to assign the users of the system to specific roles. If you don't include users in at least a minimum set of roles, they won't even be able to logon using the ScanPlus and IndexPlus modules.

User role assignments are made from the InputAccel Administration Console by clicking the **Licensing/Security** button and then selecting **View Roles** (see Figure 9). By default, there are six roles defined.

1. *Administrators* - Fixed role for Administrators which has all permissions in InputAccel.
2. *System Monitor* - Contains all permissions to use the Administration Console in read-only mode.
3. *Module Operator* - Contains permissions common to all modules for processing batches.
4. *Index Operator* - Contains permissions to use all IndexPlus functionality.
5. *Scan Operator* - Contains permissions to use all ScanPlus and RescanPlus functionality.
6. *DocumentumExport Operator* - Contains permissions to read and modify protected values.



Administration Console - Microsoft Internet Explorer provided by [redacted]

http://[redacted]Secure/ACFrame.aspx

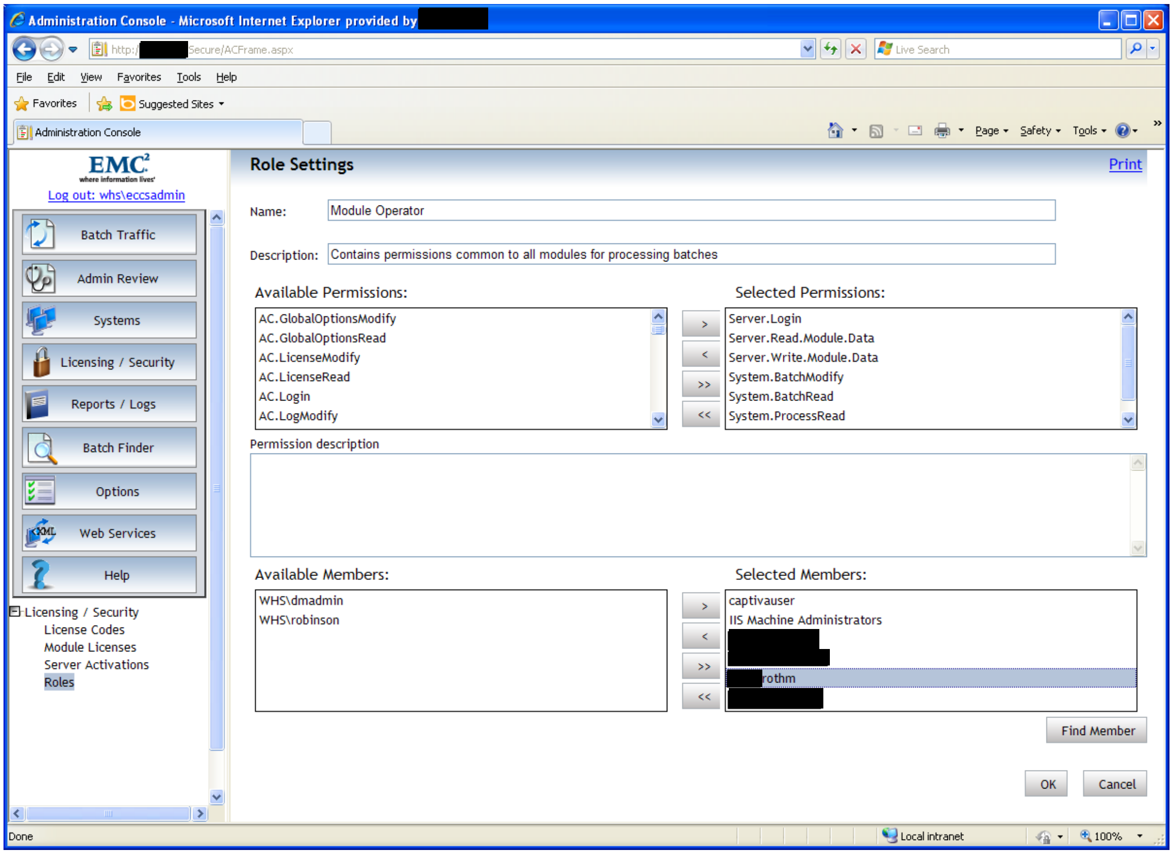
Log out: whs\eccsadmin

Roles

Name	Description
Administrators	Fixed role for Ad…
System Monitor	Contains all per…
Module Operator	Contains permis…
Index Operator	Contains permis…
Scan Operator	Contains permis…
DocumentumExport Operator	Contains permis…

Figure 9 InputAccel Roles

To open a role, select it and then click the **Settings** button (see Figure 10). To understand the role permissions available, see "Roles" in the online *Captiva Administration Guide*. The lower two boxes on the screen (**Available Members** and **Selected Members**) are used to add or remove users from this particular role. To add a user not already in the **Available Members** box, click the **Find Member** button.



Role Settings

Name: Module Operator

Description: Contains permissions common to all modules for processing batches

Available Permissions:
AC.GlobalOptionsModify
AC.GlobalOptionsRead
AC.LicenseModify
AC.LicenseRead
AC.Login
AC.LogModify

Selected Permissions:
Server.Login
Server.Read.Module.Data
Server.Write.Module.Data
System.BatchModify
System.BatchRead
System.ProcessRead

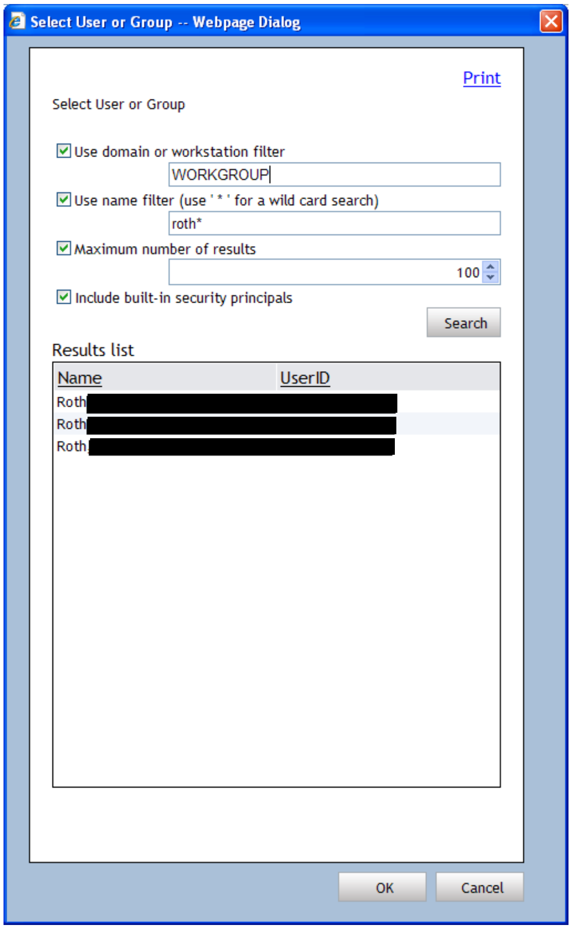
Permission description

Available Members:
WHS\dmadmin
WHS\robinson

Selected Members:
captivauser
IIS Machine Administrators
[redacted]
[redacted]rothm
[redacted]

Figure 10 InputAccel Add User to Role

The **Find Member** button opens a search screen that will allow you to search the local machine or domain for users to add to this role. (see Figure 11). Enter the necessary information to find the user and click the **Search** button. The search will populate the **Results list** box when it completes. Select a user and click **OK** to add them to the role.



Select User or Group

☑ Use domain or workstation filter: WORKGROUP

☑ Use name filter (use ' * ' for a wild card search): roth*

☑ Maximum number of results: 100

☑ Include built-in security principals

Results list

Name	UserID
Roth [redacted]	[redacted]
Roth [redacted]	[redacted]
Roth [redacted]	[redacted]

Figure 11 InputAccel Find Member Search Box

Any user who launches a module must be a member of the "Module Operator" role, this includes users who will launch modules manually, as well as system users who will run unattended tasks (e.g., OCR). In addition, any user who is doing scanning should be a member of the "Scan Operator" role and any user doing indexing should be a member of the "Index Operator" role. So, in my example process, all of my users are members of "Module Operators", "Scan Operators", and "Index Operators". My local system account on the IA Module server is a member of the "Module Operators" group because it will run the unattended tasks.

3 Module Setup

Setting up, or configuring, each module (i.e., step) in your capture process is the next step in developing your process. Modules can be launched in setup mode manually or from the InputAccel Administration Console. From the InputAccel Administration Console, simply double-click the step name. In Figure 8 instead of right-clicking to access the context menu, double-click to launch the module in setup mode.

If you prefer to launch the modules manually, you can do so from the command prompt. There are two types of modules used by InputAccel: `EXE` modules and `DLL` modules. The `EXE` modules can be launched directly. The `DLL` modules must be "hosted" by a program named `QuickModuleHost`. The table below lists the syntax to launch each of the modules in my process in setup mode. Note that you will need to know the process ID for which you are configuring the module. The process ID can be found on the InputAccel Administration Console. For my process, the process ID is `41601`, and the InputAccel server name is `IAServer`.

Module	Step	Command Line
Emc.InputAccel.Scan	ScanPlus	`QuickModuleHost -modulename:Emc.InputAccel.Scan  -login:*@IAserver -setup:41601, ScanPlus`
iaipi.exe	ImageEnhancement	`iaipi.exe -login:*@IAServer -setup:41601, ImageEnhancement`
NuanceOCR	OCR	`QuickModuleHost -modulename:NuanceOCR -login:*@IAServer -setup:41601, OCR`
Emc.InputAccel.Index	Index	`QuickModuleHost -modulename:Emc.InputAccel.Index -login:*@IAServer -setup:41601, Index`
DocumentumAdvancedExport	DocumentumExport	`QuickModuleHost -modulename:DocumentumAdvancedExport -login:*@IAServer -setup:41601, DocumentumExport`
iaxodbc2.exe	UpdateDatabase	`iaxodbc2.exe  -login:*@IAServer -setup:41601, UpdateDatabase`

One final note about setting up modules is that I have had the best results launching the modules in setup mode from the actual machines where the modules will be running, while logged in as the user who will be running the process step. For example, I setup the ScanPlus and IndexPlus modules from my workstation where those modules will be run by me. The ImageEnhancement, OCR, DocumentumExport and ODBCExport modules I launched from the IA Module Server where they will be run by a local system account. To accomplish this, I logged onto the server as the user who will be running the modules, then accessed the InputAccel Administration Console and double-clicked the module to launch it in setup mode.

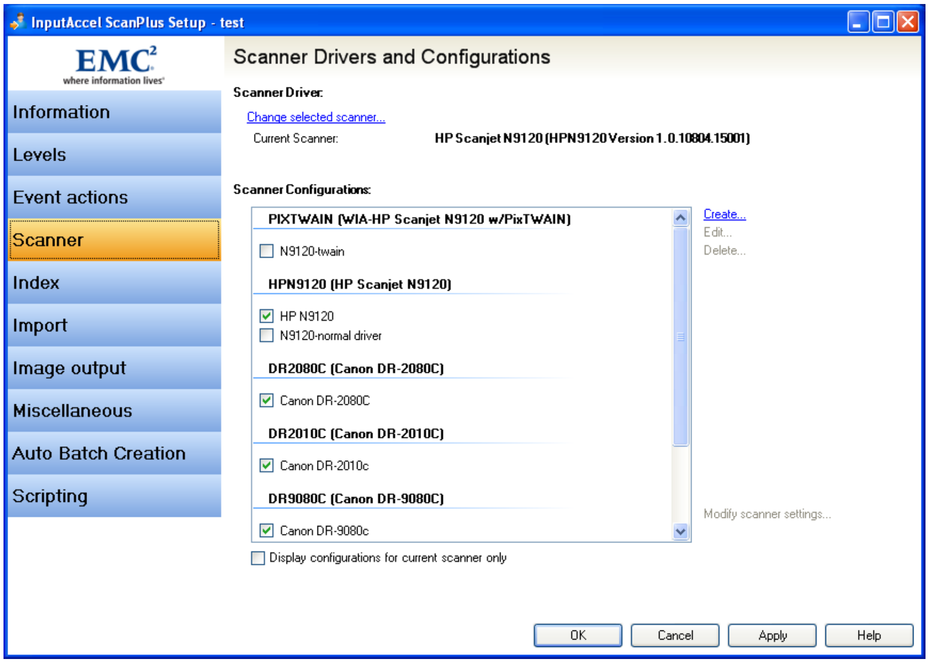
The following sections discuss the configuration of each module in more detail. As previously stated, half of the process's functionality is contained in these configurations, not in CaptureFlow Designer.

3.1 ScanPlus

I have found that there are three important areas to configure in the ScanPlus module: Scanner, Event Actions, and Auto-Batch Creation.

3.1.1 Scanner

Creating a scanner configuration and profile is straighforward. See the online help for ScanPlus for detailed information. It is important that the you create a scanner configuration profile for each scanner in your system, meaning if each user has a different model or make of scanner, create a profile for each of their scanners (see Figure 12). This will make deployment much easier.



Scanner Drivers and Configurations

Scanner Driver:

Current Scanner: HP Scanjet N9120 (HPN9120 Version 1.0.10804.15001)

Scanner Configurations:

PIXTWAIN (WIA-HP Scanjet N9120 w/PixTWAIN)

☐ N9120-twain

HPN9120 (HP Scanjet N9120)

☑ HP N9120
☐ N9120-normal driver

DR2080C (Canon DR-2080C)

☑ Canon DR-2080C

DR2010C (Canon DR-2010C)

☑ Canon DR-2010c

DR9080C (Canon DR-9080C)

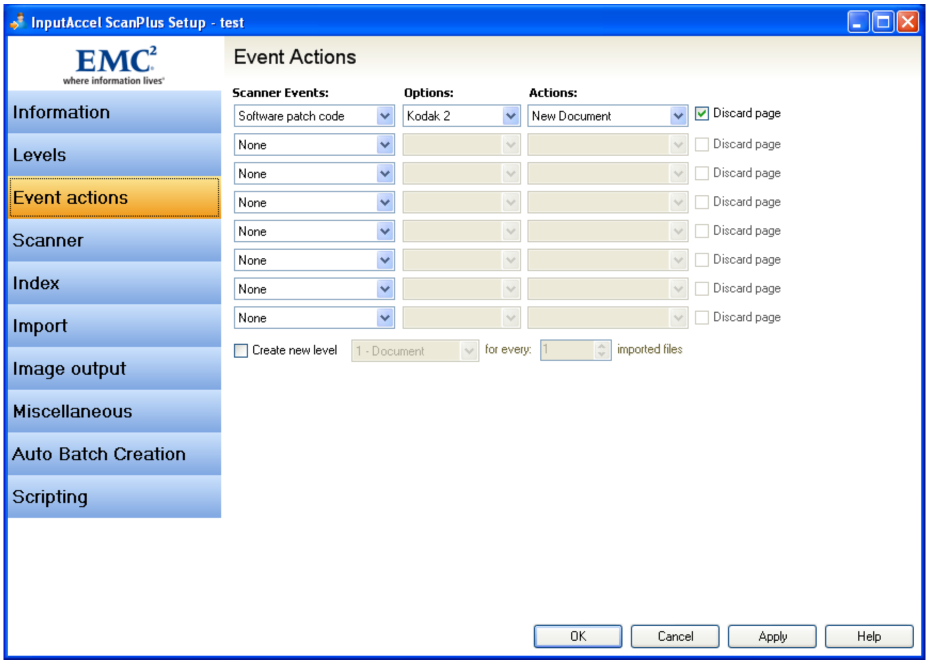
☑ Canon DR-9080c

☐ Display configurations for current scanner only

Figure 12 Scanner Configuration

3.1.2 Event Actions

If you plan to scan multiple documents in a batch and use divider pages to separate documents, you must set up an event action so InputAccel knows how to behave when a divider page is detected. In my example, I used “Kodak 2” type dividers and want InputAccel to create a new document every time it encounters one. Figure 13 shows this configuration.



Event Actions

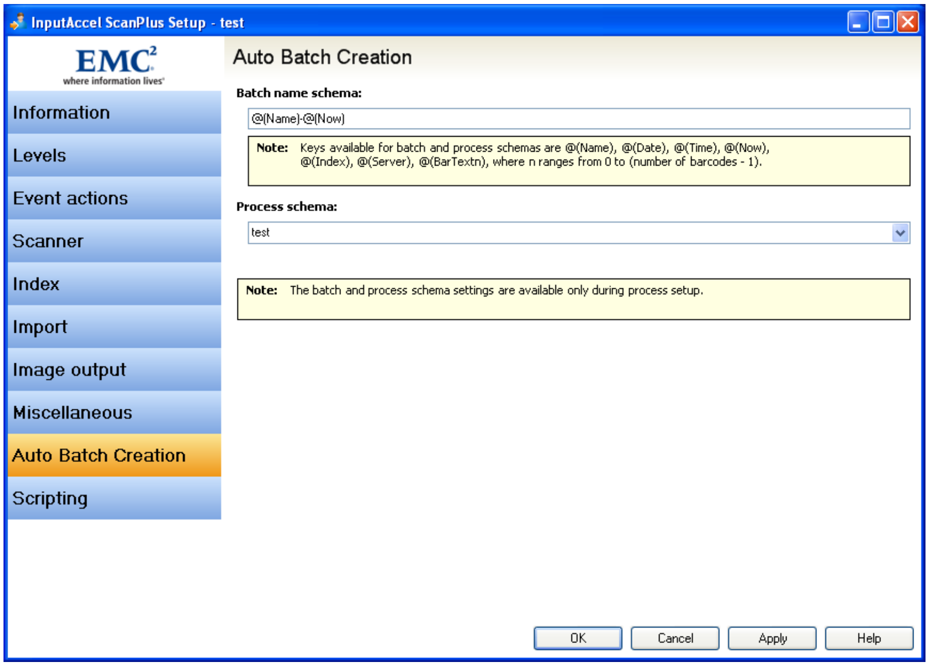
Scanner Events:	Options:	Actions:	
Software patch code	Kodak 2	New Document	☑ Discard page
None			□ Discard page
None			□ Discard page
None			□ Discard page
None			□ Discard page
None			□ Discard page
None			□ Discard page
None			□ Discard page

□ Create new level 1 - Document for every: 1 imported files

Figure 13 Event Actions

3.1.3 Auto-Batch Creation

Auto-batch creation allows you to apply a template to the name of each batch created by the user. Implementation is easy though limited to what is described on the screen. For my process, I set the **Process schema** to my process name, “test”, and set the **Batch name schema** to “@(Name)-@(Now)” (see Figure 14). This will produce batches with names like “Scott-20120213-102652”.



Auto Batch Creation

Batch name schema: @(Name)-@(Now)

Note: Keys available for batch and process schemas are @(Name), @(Date), @(Time), @(Now), @(Index), @(Server), @(BarTextn), where n ranges from 0 to (number of barcodes - 1).

Process schema: test

Note: The batch and process schema settings are available only during process setup.

Figure 14 Auto-Batch Creation

3.2 Image Enhancement

I have found that configuring image enhancement is largely a trial and error process. InputAccel provides some sample images you can play with (they are located in the `C:\Program Files\InputAccel\Client\images` folder) to get a feel for the effect of each filter. You may also need to experiment with the brightness and contrast settings on each scanner's configuration profile to achieve optimal results.

In my process, the image enhancement step applies a de-skew filter (see Figure 15) and occurs automatically with no user intervention. You can configure the specifics of each filter by right-clicking on document thumbnail in the **Filter list** and choosing **Properties**.

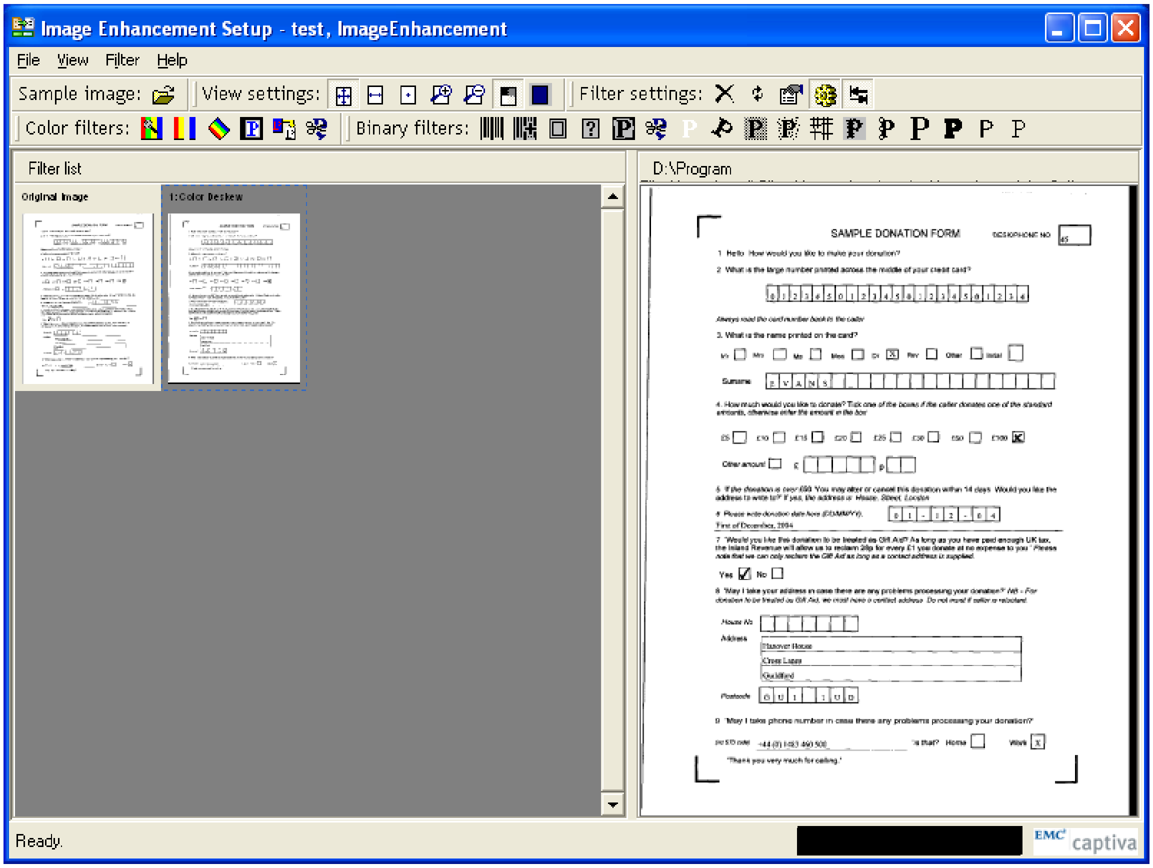


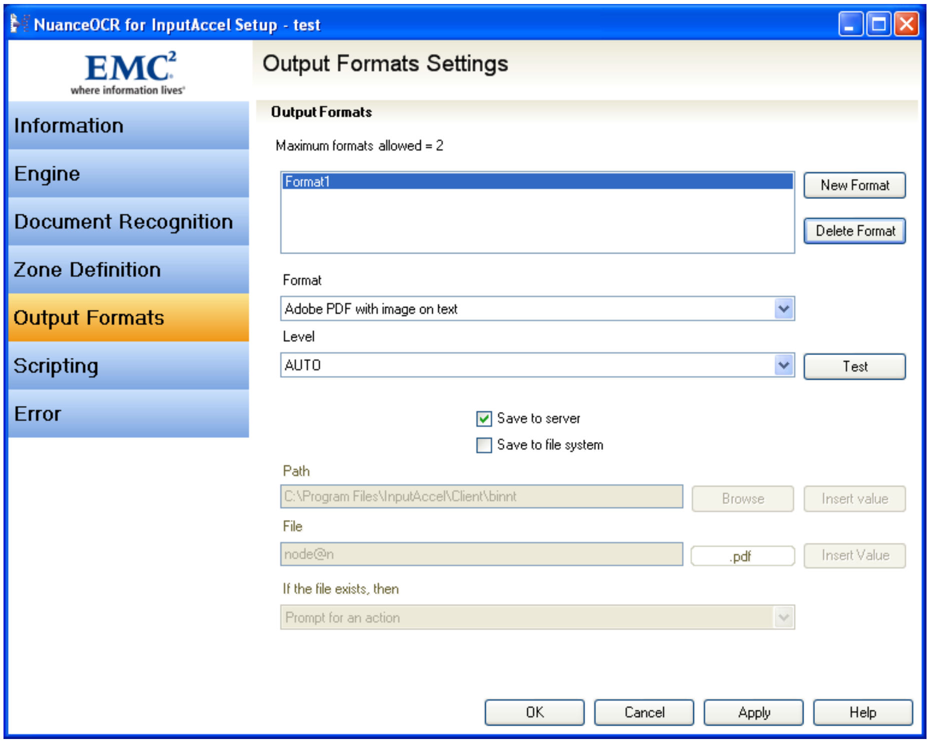
Figure 15 Image Enhancement – De-skew

If you are using a barcode detection filter it must be the *first* filter applied to the image or it won't detect the barcodes. If you do configure a barcode filter, note that it won't evaluate the sample image until you click on the filter thumbnail in the **Filter list**. I have had the best results using the "Extended Barcode Detection Filter" and setting the **Decode symbols** option to off (i.e., unselecting it).

3.3 OCR

The OCR module can do some really powerful stuff by setting up zones and filters. This kind of OCRing is beyond the needs of this simple tutorial, so I leave that to explore for yourself, if the need arises.

The only OCR configuration needed for my simple example is to create a full-text searchable PDF file. This is accomplished by creating a **New Format** on the **Output Formats** tab. For the output **Format**, choose “Adobe PDF with image on text”, and set the **Level** to “Auto”. Figure 16 depicts this configuration.



Output Formats Settings

Output Formats

Maximum formats allowed = 2

Format1

Format: Adobe PDF with image on text

Level: AUTO

☑ Save to server

☐ Save to file system

Path: C:\Program Files\InputAccel\Client\binnt

File: node@n .pdf

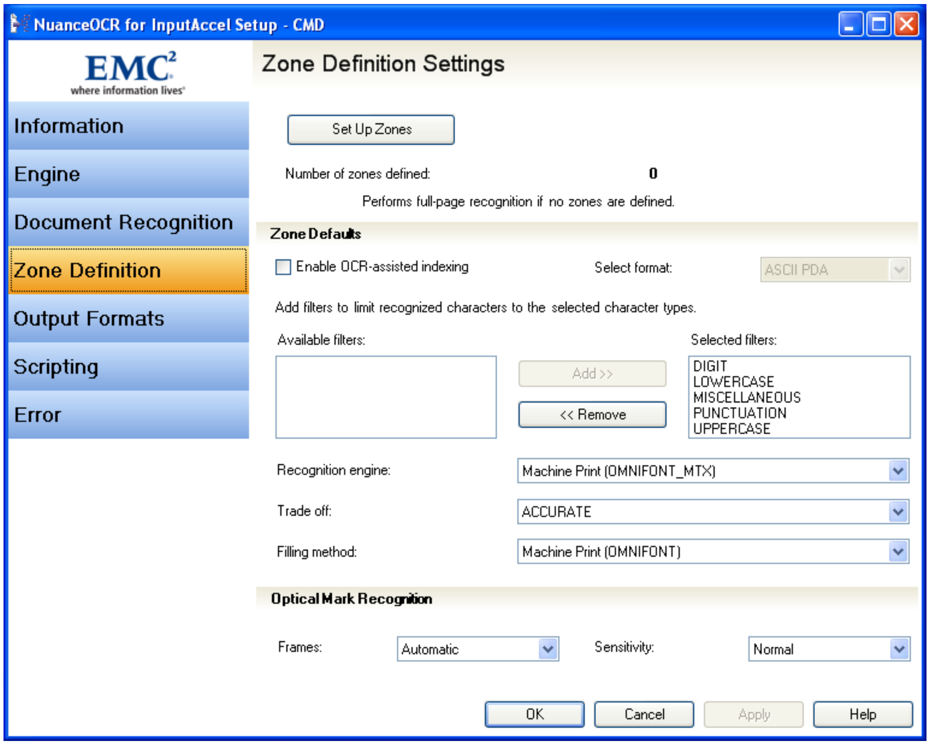
If the file exists, then: Prompt for an action

Figure 16 Create PDF File

In my process, the OCR step occurs automatically, with no user intervention. Recall from Section 2.2.3 where I assigned IA Values, that the output from this step (i.e., the PDF file) is the input for the Documentum export step.

```
DocumentumExport:1.InputFile1 = OCR:1.OutputFile1_OutputFile
```

One caveat with the OCR module: if you have sparse content with diverse character sets, sometimes the module gets confused about which recognition engine it should use and can throw memory fault exceptions. For example, I have noticed in my system that when I have computer-generated fax coversheets with a printed header in the top third of the page, and a hand written personal note below that, the OCR module can’t decide which recognition engine to use, print or handwriting. Content of this type frequently throws memory fault exceptions. I believe it is because there is not a large enough sample set for the module to determine which recognition engine gives the best results. To alleviate this problem, I manually set the **Recognition engine** to “Machine Print (OMNIFONT_MTX)”. See Figure 17.



Zone Definition Settings

Number of zones defined: 0

Performs full-page recognition if no zones are defined.

Zone Defaults

☐ Enable OCR-assisted indexing

Select format: ASCII PDA

Add filters to limit recognized characters to the selected character types.

Available filters:

Selected filters: DIGIT, LOWERCASE, MISCELLANEOUS, PUNCTUATION, UPPERCASE

Recognition engine: Machine Print (OMNIFONT_MTX)

Trade off: ACCURATE

Filling method: Machine Print (OMNIFONT)

Optical Mark Recognition

Frames: Automatic

Sensitivity: Normal

Figure 17 Manually Select OCR Recognition Engine

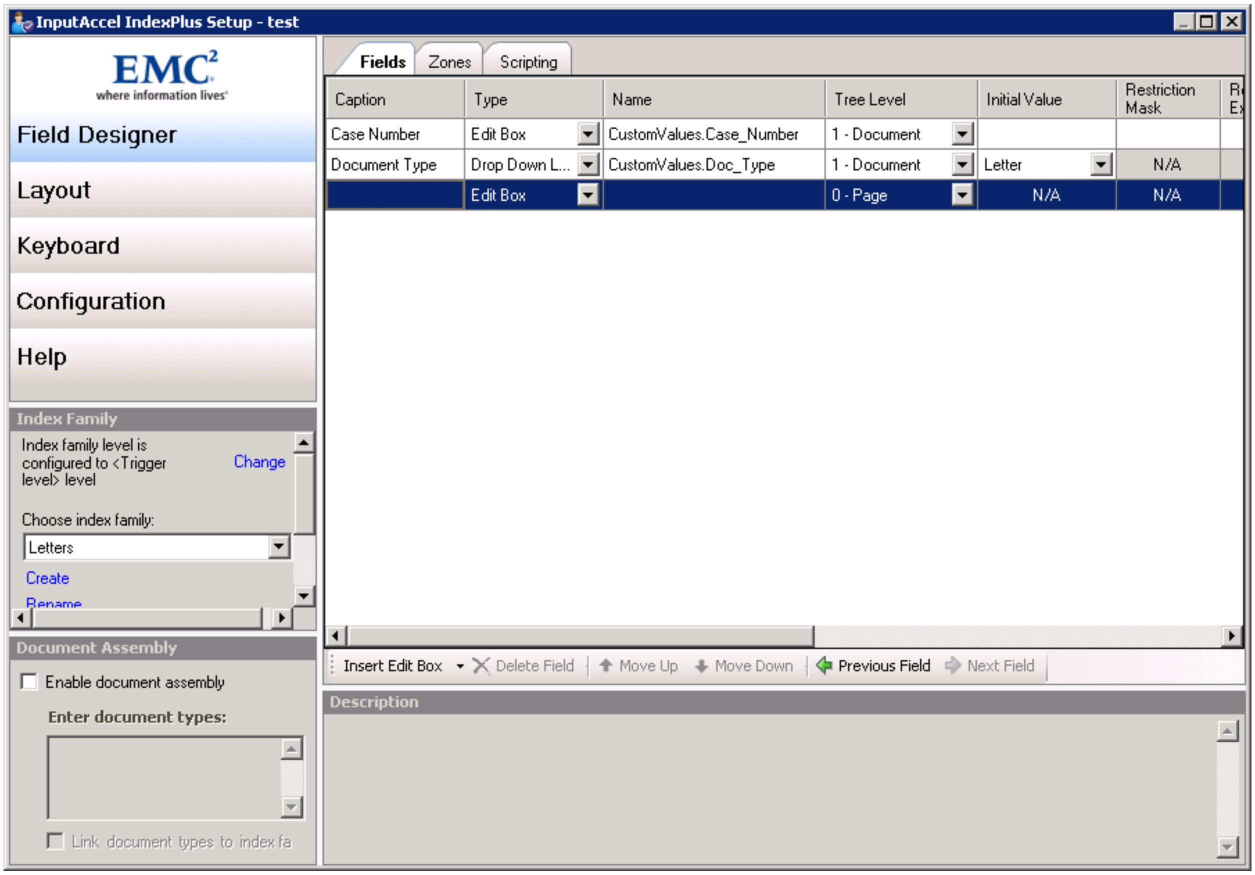
3.4 Indexing

The Indexing step is where users enter metadata about each document scanned, for example: a memo’s subject, or the sender and recipient’s names, or the type of document. Each field that is indexed should correspond to a Custom Value or an IA Value discussed in Section 2.2. These values can then be used later in the process or exported to Documentum or a database.

To configure the Index step, launch IndexPlus in setup mode and click the **Settings** tab, then the **Settings…** button.

In my example, I only request that the user enter a Case Number (optional), and the Document Type (required). The Case Number entered is stored in `CustomValue:1.Case_Number` variable and later used to determine if an external database needs to be updated. The Document Type entered is stored in `CustomValues:1.Doc_Type` variable and is later passed to Documentum as an attribute of the content object.

To add indexing fields, first create an Index Family in the **Index Family** window on the left. Be sure to un-check the **Generate value names automatically** checkbox. Then add indexing fields in the window on the right using the **Insert …** button at the bottom of the widow. See Figure 18.



Index Family

Index family level is configured to <Trigger level> level Change

Choose index family: Letters

Create

Rename

Document Assembly

☐ Enable document assembly

Enter document types:

☐ Link document types to index fa

Caption	Type	Name	Tree Level	Initial Value	Restriction Mask	R E
Case Number	Edit Box	CustomValues.Case_Number	1 - Document			
Document Type	Drop Down L...	CustomValues.Doc_Type	1 - Document	Letter	N/A	
	Edit Box		0 - Page	N/A	N/A	

Figure 18 Index Module Configuration

Following are the specifications for the Case Number indexing field:

- **Caption**: Case Number
- **Type**: Edit Box
- **Name**: CustomValues:1.Case_Number
- **Tree Level**: 1 – Document (This determines the scope of variables visible in the **Name** column. You may have to set this value before you can select the `CustomValues:1.Case_Number` variable in the **Name** column.)
- **Editable**: selected
- **Numeric Only**: selected
- **Visible**: selected

Following are the specifications for the Document Type indexing field:

- **Caption**: Document Type
- **Type**: Drop Down List Box
- **Name**: CustomValues:1.Doc_Type
- **Tree Level**: 1 – Document
- **Initial Value**: Letter (You can set this value after you enter the list of possible values in the **Items** column.)

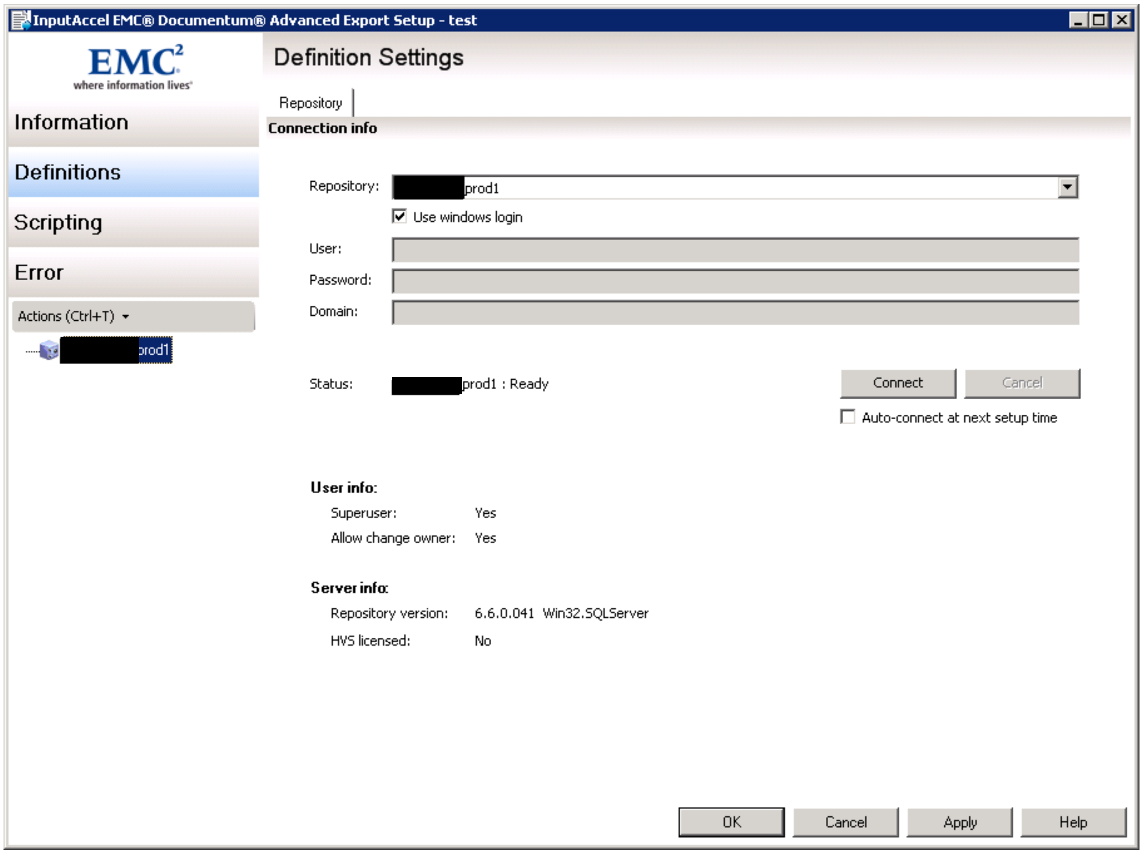
- **Editable**: selected
- **Items**: Letter, Memo, Reply, Note
- **Visible**: selected

3.5 Documentum Export

The EMC Documentum Advanced Export module allows you to automatically export content (i.e., your scanned and/or OCRed image) from InputAccel into Documentum. Of all the modules, I have found this one to be the most temperamental as to whom you login as to configure it. I recommend that you login to the server where the Documentum Export module will run, as the user who will be running it, in order to configure it. Obviously, since no configuration or logic implementation was possible for this module in CaptureFlow Designer, all of that work will be done here.

3.5.1 Connection Info

From the **Information** screen of the Documentum Advanced Export module, click the **Definitions** tab. In the **Connection info** pane, configure your connection information (see Figure 19). Again, I have had the best success clicking the **Use windows login** checkbox and allowing the module to connect as the currently logged in user. This assumes, of course, that the user is a valid Documentum user.



InputAccel EMC® Documentum® Advanced Export Setup - test

Definition Settings

Connection info

Repository: [redacted]prod1

☑ Use windows login

User:

Password:

Domain:

Status: [redacted]prod1 : Ready

☐ Auto-connect at next setup time

[redacted]prod1

User info:

Superuser: Yes

Allow change owner: Yes

Server info:

Repository version: 6.6.0.041 Win32.SQLServer

HVS licensed: No

Figure 19 Documentum Export Connection Configuration

Also, un-check the **Auto-connect at next setup time** checkbox. This will require you to click the **Connect** button every time you run setup on this module (which shouldn't be too often after this). However, it will also prevent the module from locking the user account by exceeding the failed login attempts should the user account or password that runs this module change.

Click the **Connect** button. The module will connect to the Documentum repository and extract some basic information. This process can take a minute or two depending upon all of the usual hardware and network conditions that can affect performance.

3.5.2 Storage Structure

Once the connection to the repository has completed, you should see a single node under the **Actions** tab menu that represents your repository.

In my process, correspondence is stored in a cabinet named `/Correspondence`. The Correspondence cabinet contains a folder structure into which the scanned documents will be placed. The structure of the folders is like this: `/Year/Month/Day`, such that each scanned document will be placed in a folder structure corresponding to the date on which it was scanned (see Figure 20). If any part of the folder structure does not exist (e.g., a new day or month), I have the Documentum Export module automatically create it.

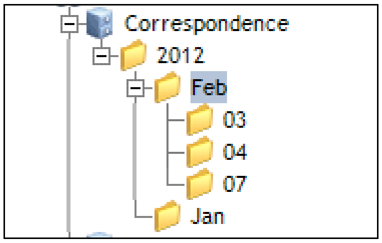
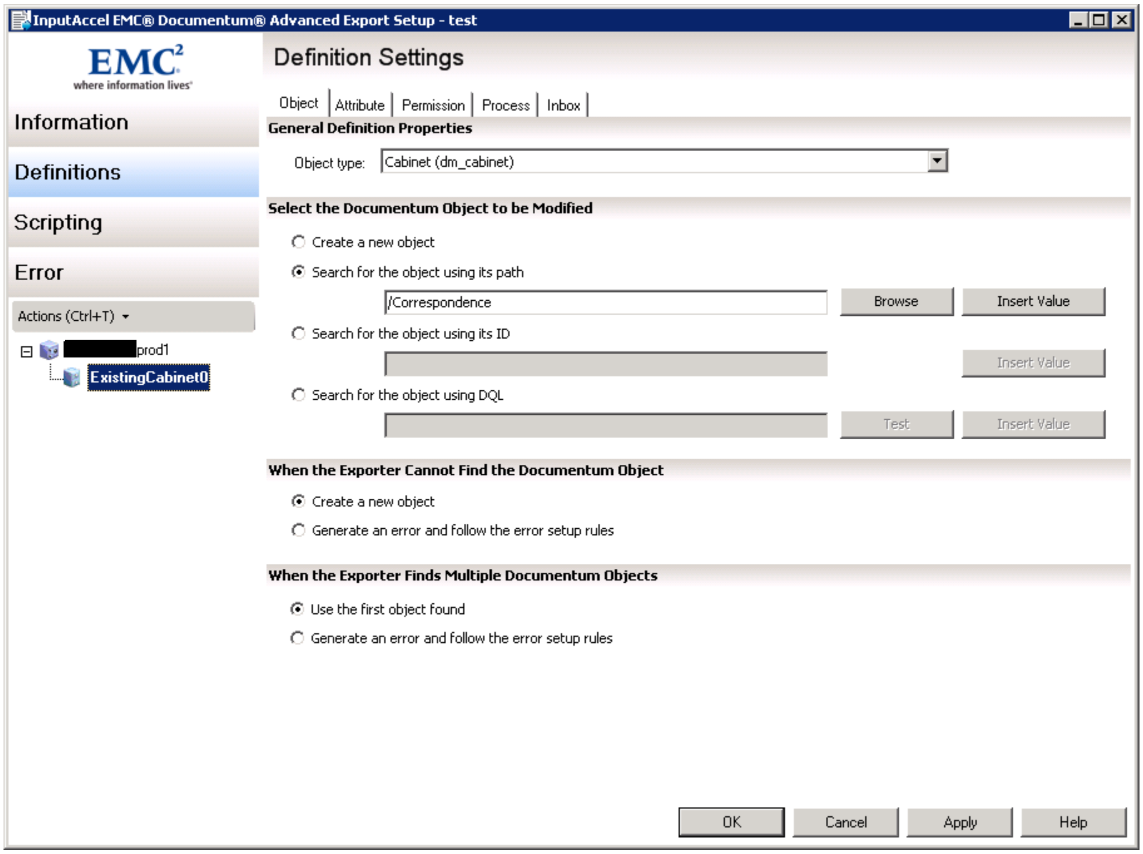


Figure 20 Correspondence Storage Structure

3.5.3 Cabinet

The first step in the configuration task was to define the cabinet in which to build the folder structure. Right-click on the node representing the repository and choose **Add definition… -> Cabinet**. On the **Object** tab (see Figure 21), make the following settings:

- **Object type**: Cabinet (dm_cabinet)
- **Search for the object using its path**: `/Correspondence` (You can click the **Browse** button if you would like to browse the repository for the cabinet instead of typing its path.)
- **When the Exporter Cannot Find the Documentum Object**: Create a new object
- **When the Exporter Finds Multiple Documentum Objects**: Use the first object found


InputAccel EMC® Documentum® Advanced Export Setup - test

[redacted]prod1
ExistingCabinet0

Definition Settings

General Definition Properties

Object type: Cabinet (dm_cabinet)

Select the Documentum Object to be Modified

- ○ Create a new object
- ● Search for the object using its path
  /Correspondence
- ○ Search for the object using its ID
- ○ Search for the object using DQL

When the Exporter Cannot Find the Documentum Object

- ● Create a new object
- ○ Generate an error and follow the error setup rules

When the Exporter Finds Multiple Documentum Objects

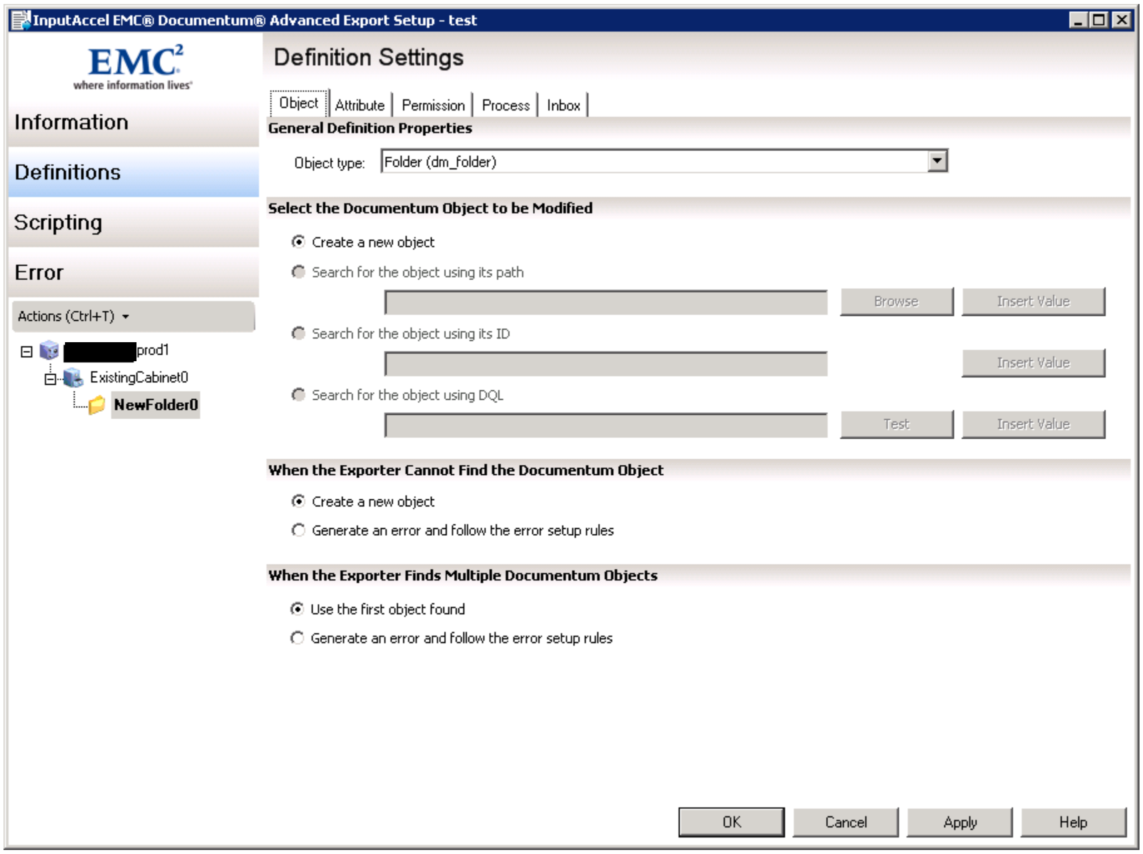
- ● Use the first object found
- ○ Generate an error and follow the error setup rules

Figure 21 Documentum Export Cabinet Configuration

3.5.4 Folders

Right-click the cabinet node (called **ExistingCabinet0**) and choose **Add definition**... -> **Folder**. A new folder is added to the cabinet, this will be the year portion of the storage path. Select the folder to display the definition settings for it. On the **Object** tab (see Figure 22), make the following settings:

- **Object type**: Folder (dm_folder)
- **Search for the object using its path**: Create a new object (you have no choice here).
- **When the Exporter Cannot Find the Documentum Object**: Create a new object. This is the key setting for automatically creating new folders when the day/month/year changes.
- **When the Exporter Finds Multiple Documentum Objects**: Use the first object found.



[redacted]prod1
ExistingCabinet0
NewFolder0

Definition Settings

General Definition Properties

Object type: Folder (dm_folder)

Select the Documentum Object to be Modified

● Create a new object
○ Search for the object using its path
○ Search for the object using its ID
○ Search for the object using DQL

When the Exporter Cannot Find the Documentum Object

● Create a new object
○ Generate an error and follow the error setup rules

When the Exporter Finds Multiple Documentum Objects

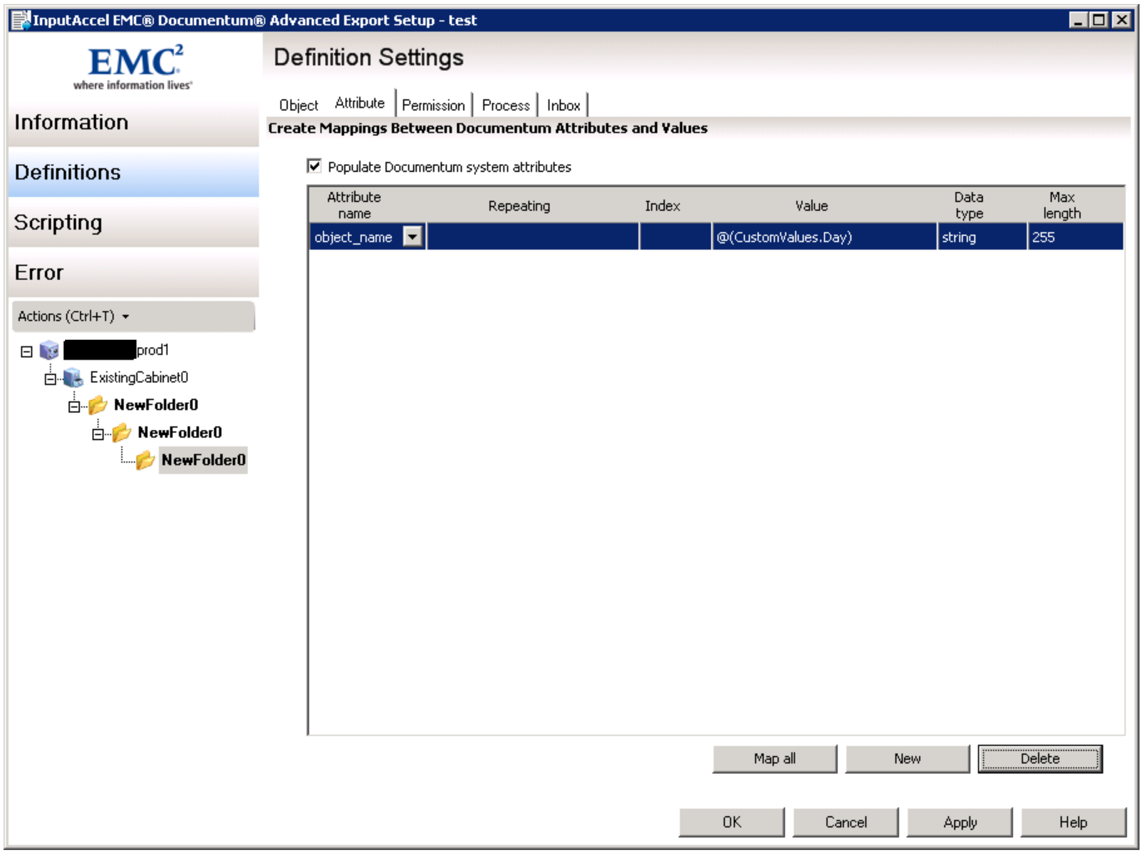
● Use the first object found
○ Generate an error and follow the error setup rules

Figure 22 Documentum Export Folder Configuration

Now, click the **Attribute** tab to define the attributes that will be set for the new folder object (see Figure 23). Click the **Populate Documentum system attributes** checkbox and then click the **New** button. In the **Attribute name** column, select object_name from the drop down list. In the **Value** cell, enter or select @(CustomValues.y). Recall in Section 2.2.3, we defined the CustomValues:1.y value to contain the current year.

Select the **NewFolder0** node and create a subfolder for the month portion of the storage path in the same manner you created the year folder. The value for its `object_name` attribute should be `@(CustomValues.Month).`

Repeat the process once more for the day folder. Give the `object_name` a value of `@(CustomValues.Day).`



Create Mappings Between Documentum Attributes and Values

☑ Populate Documentum system attributes

Attribute name	Repeating	Index	Value	Data type	Max length
object_name			@(CustomValues.Day)	string	255

- [redacted]prod1
  - ExistingCabinet0
    - NewFolder0
      - NewFolder0
        - NewFolder0

Figure 23 Documentum Export Folder Attributes Configuration

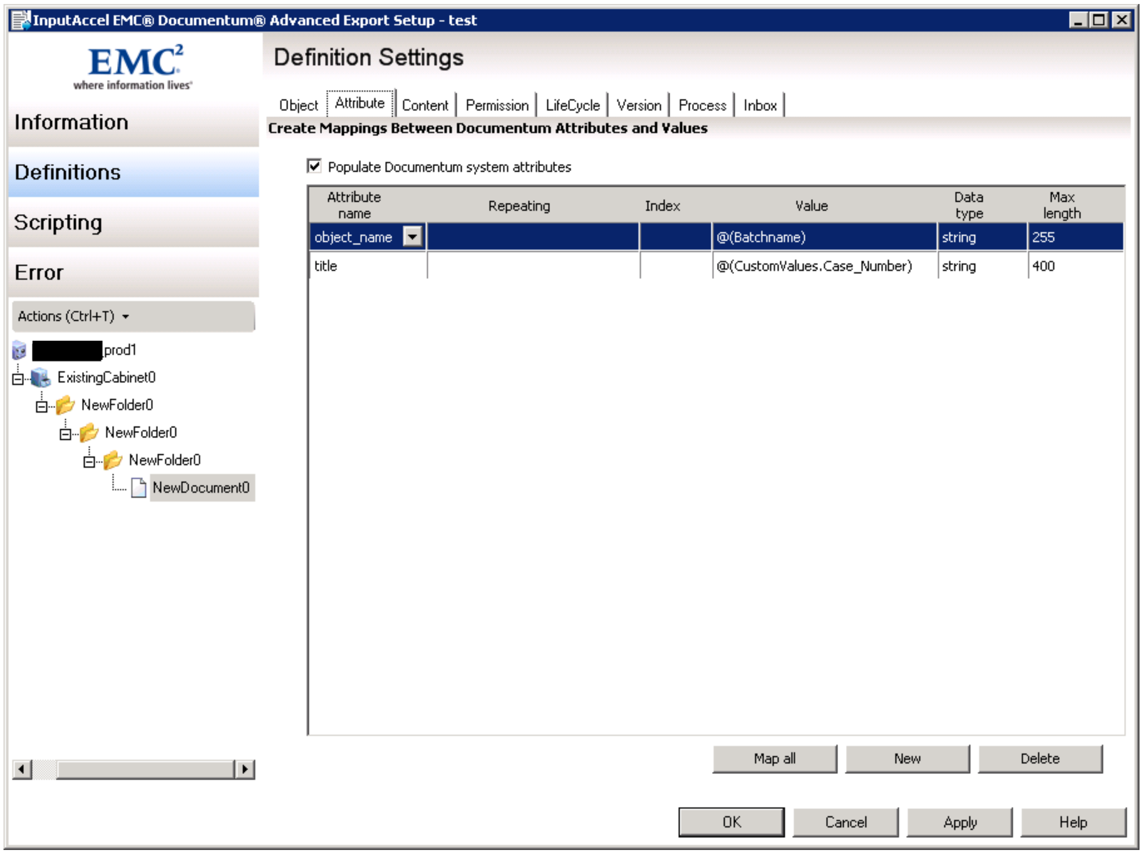
3.5.5 Document Metadata Definition

Finally we get to the step where we define the content that will be exported from InputAccel into Documentum.

Select the last folder you defined, right-click and select **Add definition... -> Document**. On the **Object** tab, make sure the **Object type** is set to `Document (dm_document)`. All of the other settings on this tab should default to the same settings as the folders you configured.

For my correspondence, I set two attributes, `object_name` and `title`, using IA and Custom Values entered or derived earlier in the process. Click the **Attribute** tab, make sure the **Populate Documentum system attributes** checkbox is checked, and click the **New** button. Add the `object_name` attribute and the `title` attribute. For the `object_name` attribute, assign it a value of `@(Batchname)`, and for the `title` attribute, assign the value `@(CustomValues:1.Case_Number)`. See Figure 24.

The `@(Batchname)` IA value contains the name of the scan batch which is controlled by the auto-batch creation template we defined in the scanning module (see Section 3.1.3). The `@(CustomValues:1.Case_Number)` contains the case number entered by the user in the Index step (see Section 3.4).



Definition Settings

Create Mappings Between Documentum Attributes and Values

- [redacted]prod1
  - ExistingCabinet0
    - NewFolder0
      - NewFolder0
        - NewFolder0
          - NewDocument0

☑ Populate Documentum system attributes

Attribute name	Repeating	Index	Value	Data type	Max length
object_name			@(Batchname)	string	255
title			@(CustomValues.Case_Number)	string	400

Figure 24 Documentum Export Document Attributes Configuration

3.5.6 Document Content Definition

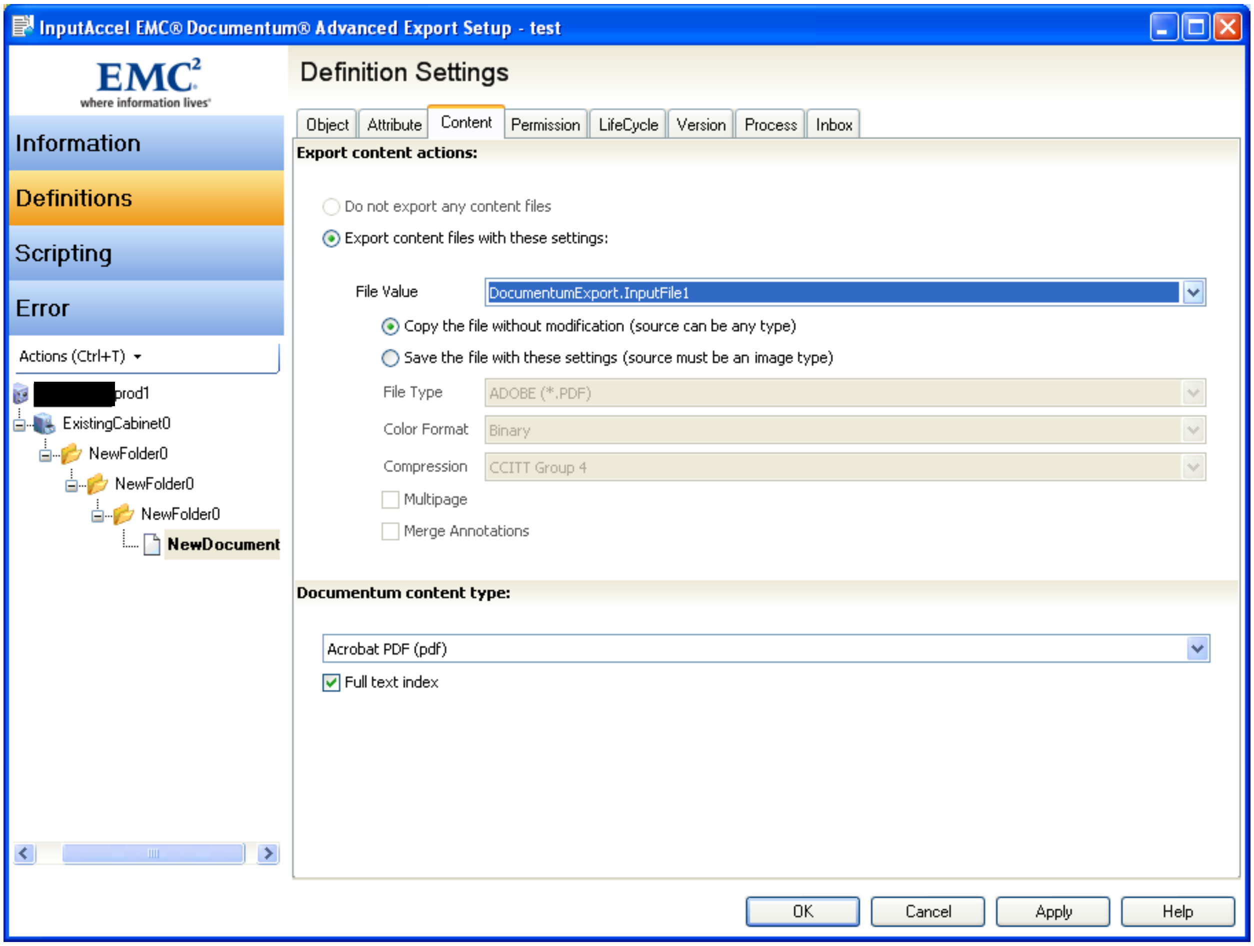
The final step in configuring the Documentum Export step is to define what content should be exported from InputAccel and imported to Documentum. Click the **Content** tab to make these configurations (see Figure 25).

In the **Export content actions** window, select **Export content files with these settings**. In the **File Value** field, choose `DocumentumExport.InputFile1` as the source of the content file to export. This IA value contains the scanned image after it has gone through the Image Enhancement filters we defined in Section 3.2. Recall that we specifically assigned the value of `DocumentumExport:1.InputFile1 = OCR:1.OutputFile1_OutputFile` back in Section 2.2.3.

Next, choose to **Copy the file without modification (source can be any type)**. Also choose **Acrobat PDF (pdf)** in the **Documentum content type** section.

There are other options here. If I had assigned a “raw” type to the `DocumentumExport:1.ImportImage` variable, and selected **Save the file with these settings (source must be an image type)** option, we could have the Documentum export module convert the file to the type specified in the **File Type** field (e.g., a searchable PDF). For more information about this option, see the Documentum Advanced Export Module’s online help guide.

Click the **Apply** and **OK** buttons to save the configuration and close the module.



Export content actions:

○ Do not export any content files

● Export content files with these settings:

File Value: DocumentumExport.InputFile1

● Copy the file without modification (source can be any type)

○ Save the file with these settings (source must be an image type)

File Type: ADOBE (*.PDF)

Color Format: Binary

Compression: CCITT Group 4

□ Multipage

□ Merge Annotations

Documentum content type:

Acrobat PDF (pdf)

☑ Full text index

Figure 25 Documentum Export Document Content Configuration

3.6 ODBC Export

The ODBC Export module allows you to send data to or extract data from a database. In my process, if a Case Number was entered in the Index step, the Case Number and the Documentum object Id need to be inserted into a table in an external database.

3.6.1 ODBC Connection

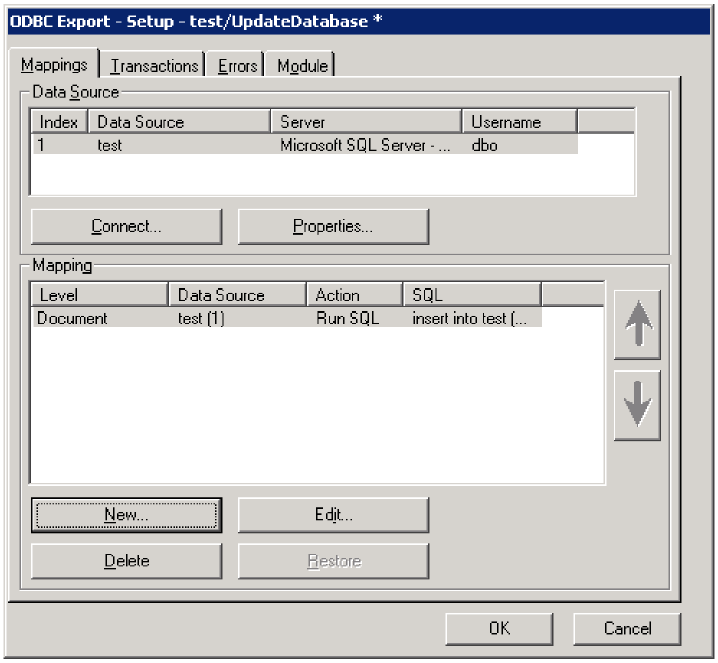
The first step in setting up the ODBC Export module is to configure an ODBC data source. Use the ODBC Data Source Administrator wizard [Start -> Programs -> Administrative Tools -> Data Sources (ODBC) on most workstations] to configure a System DSN *on the computer that will be running the ODBC Export module*. In defining the ODBC connection, you can specify "Windows NT Authentication" if the ODBC Export module will be run as an account that has database access, or you can specify a specific login user. Make sure you set the default database to the correct database. This will simplify your queries somewhat.

3.6.2 ODBC Export Module Configuration

Once a System DSN has been created, you can launch the ODBC Export module in setup mode using one of the methods described earlier in this section. Again, I found it best to do this from the computer that will be running the module.

3.6.2.1 Data Source Connection

Once the ODBC Export module is open, click the **Connect...** button in the **Data Source** panel to establish the ODBC connection for the module (see Figure 26). Select the System DSN you created in Section 3.6.1. If you have multiple System DSNs configured, you will see them listed here. It is possible to configure queries to run against multiple databases.



Index	Data Source	Server	Username
1	test	Microsoft SQL Server - ...	dbo

Level	Data Source	Action	SQL
Document	test (1)	Run SQL	insert into test (...

Figure 26 ODBC Export Configuration

3.6.2.2 Mappings

Click the **New...** button in the **Mapping** panel to create a new mapping (i.e., a new query). The **Edit Mapping** window will appear (see Figure 27).

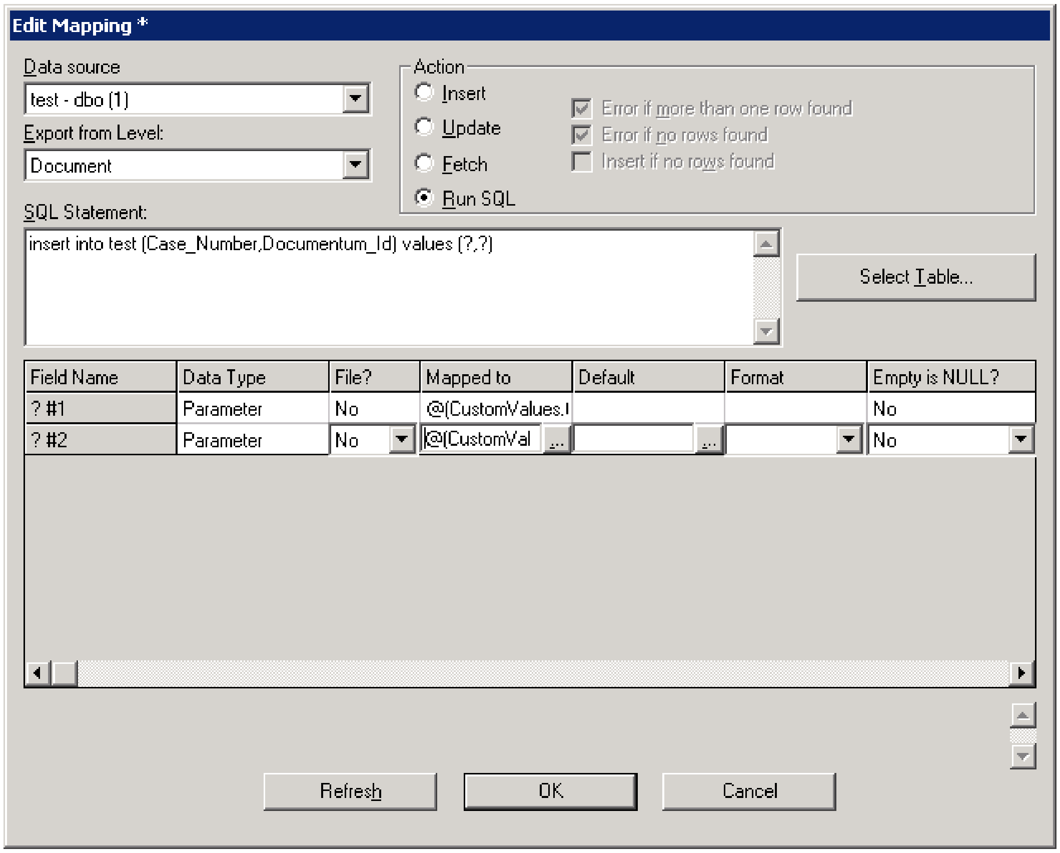
- In the **Data source** field, select the DSN you configured in Section 3.6.2.1.
- In the **Export from Level** field, select **Document**. Remember from Section 2.1 that InputAccel maintains scan information at numerous levels (e.g., batch, document, page). We are configuring the ODBC Export module to trigger and export information on a per document basis.
- In the **Action** panel, choose **Run SQL**. This is not the obvious choice since we will be writing an "Insert" query to update the database. However, I have determined that the **Run SQL** selection here is the easiest option. I have encountered problems using the "Insert" action that are magically resolved by selecting **Run SQL**.

3.6.2.2.1 SQL Query

Type the SQL insert statement into the **SQL Statement** edit box. Enter "?" for parameters that will be passed into the query statement. In this example, the SQL insert statement looks like this:

```
INSERT INTO test (Case_Number, Documentum_Id) VALUES (?,?)
```

Note: the table in my database is named `test` and only contains the two columns specified here: `Case_Number` and `Documentum_Id`. The steps for creating this table in your database are left to your abilities.



Edit Mapping *

Data source: test - dbo (1)

Export from Level: Document

Action: ○ Insert ○ Update ○ Fetch ● Run SQL

☑ Error if more than one row found
☑ Error if no rows found
☐ Insert if no rows found

SQL Statement:

```
insert into test (Case_Number,Documentum_Id) values (?,?)
```

Field Name	Data Type	File?	Mapped to	Default	Format	Empty is NULL?
? #1	Parameter	No	@(CustomValues.I			No
? #2	Parameter	No	@(CustomVal			No

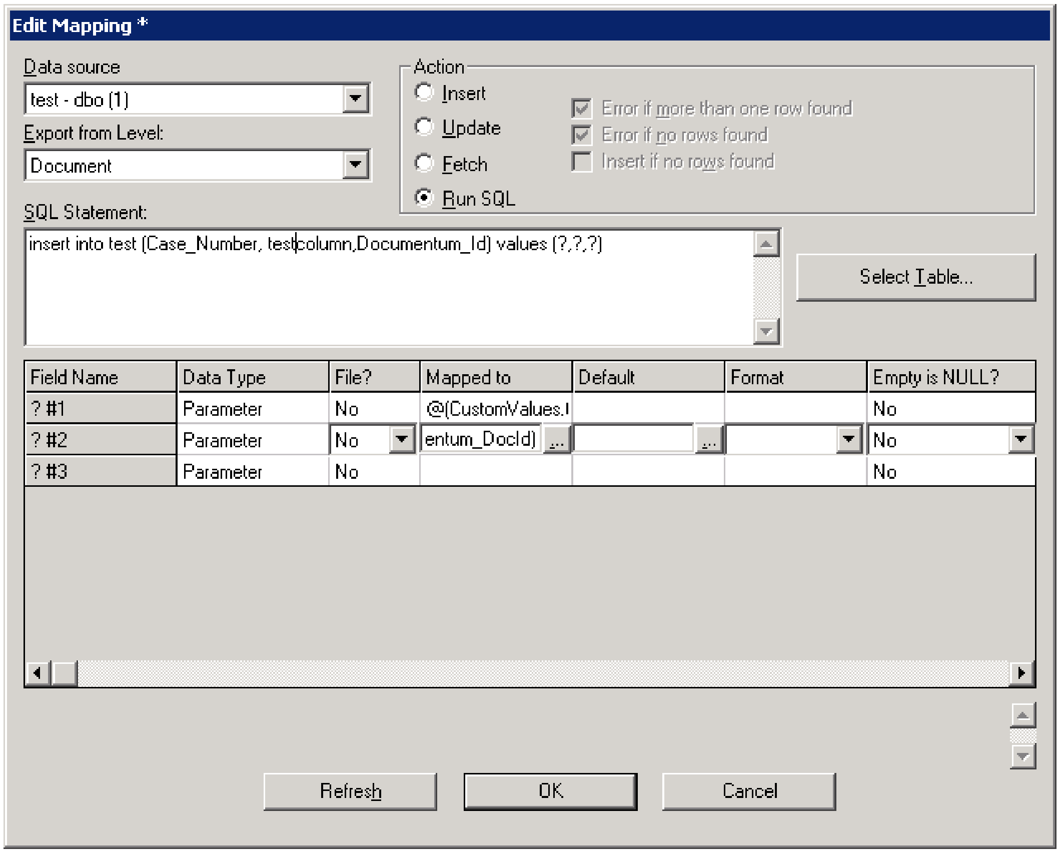
Figure 27 ODBC Query Configuration

3.6.2.2.2 Parameters

Below the query, in the field mapping area, map the input parameters as follows:

- **?#1** = `@(CustomValues.Case_Number)`. The `Case_Number` value was entered in the Index step and used in the process branch to determine if this module should run.
- **?#2** = `@(CustomValues.Documentum_Id)`. The Documentum Id (i.e., `r_object_id` of the imported object) is automatically returned by the Documentum Export module. In the process flow, I assigned this value to the Custom Value `CustomValues:1.Documentum_DocId` (see Section 2.2.3).

One thing to note about parameters and SQL statements: I have discovered that you need to enter them from beginning to end, with correct parameter placement and mapping. If, after you have entered the SQL, you need to add, remove, or rearrange the parameters, you should just delete the SQL and mappings completely and re-enter them. The problem is that parameter mappings seem to get assigned once and don't adjust with changes in the SQL. For example, if I changed my query by inserting a column and parameter between `Case_Number` and `Documentum_Id`, parameter `?#1` would still map to `Case_Number`, and `?#2` would still map to `Documentum_Id` even though it is now the third parameter in the SQL statement (see Figure 28). If you aren't careful, this can cause a great deal of confusion, and as you will see in Section 4, troubleshooting ODBC Export is not simple.



Data source: test - dbo (1)

Export from Level: Document

Action:
○ Insert
○ Update
○ Fetch
● Run SQL

☑ Error if more than one row found
☑ Error if no rows found
□ Insert if no rows found

SQL Statement:

```
insert into test (Case_Number, testcolumn,Documentum_Id) values (?,?,?)
```

Field Name	Data Type	File?	Mapped to	Default	Format	Empty is NULL?
? #1	Parameter	No	@(CustomValues.I			No
? #2	Parameter	No	entum_DocId)			No
? #3	Parameter	No				No

Figure 28 SQL Parameter Confusion

3.7 Multi

The Multi module was not directly included in our CaptureFlow Designer process, but was indirectly included when the **End** node was configured to **Delete Batches**. Multi does not require any configuration, but needs to be running on the IA Module Server in order to delete batches as they complete.

4 Testing and Debugging

This section summarizes the few tips I have gathered for debugging and testing processes in InputAccel. Unfortunately, InputAccel does not have a unified development/debugging environment. Therefore, to debug a process or problem batch, you have to jump around among several screens, tools, and servers.

4.1 Admin Console

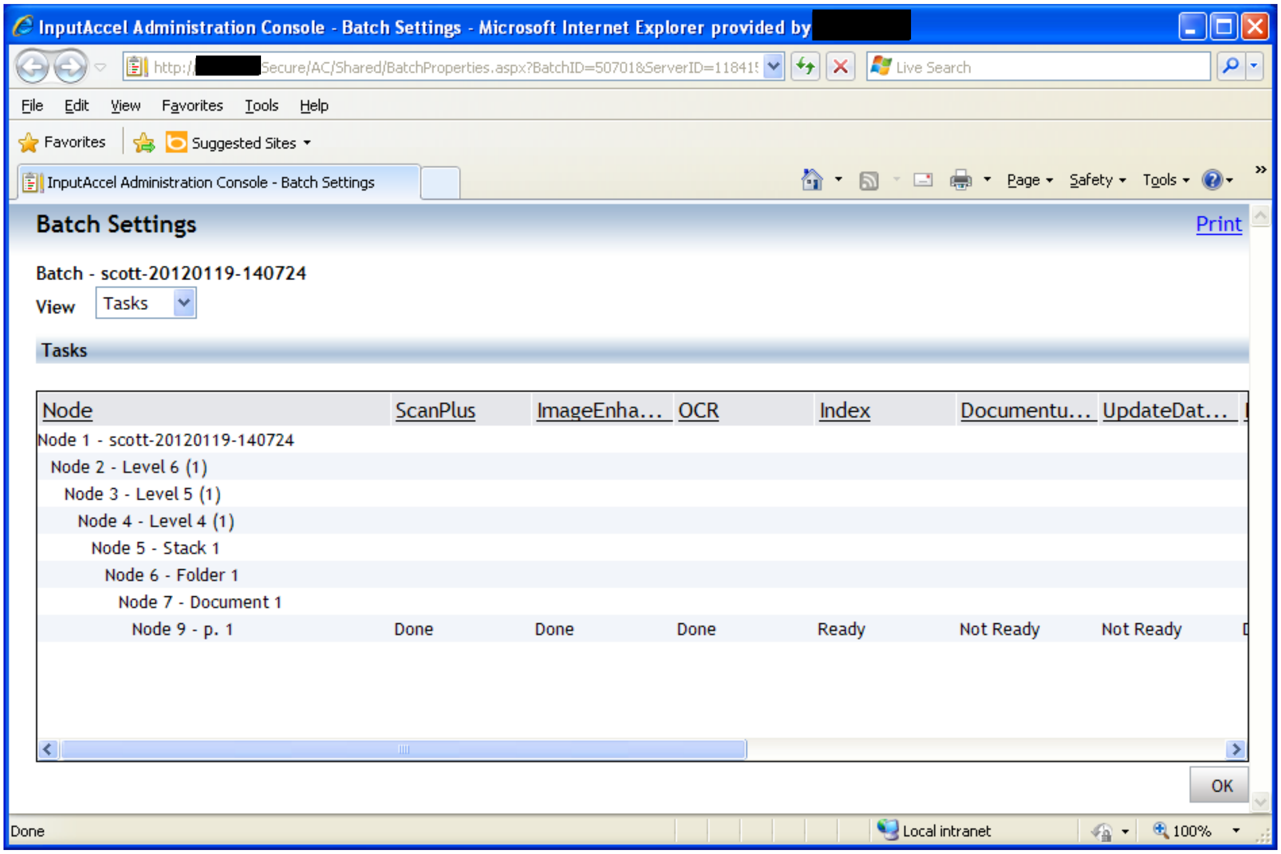
One of the most valuable tools for testing and debugging a capture process or misbehaving batch is the InputAccel Administration Console. From the Administration Console you can view batch details, to include the status of each step; view and modify IA and Custom Values; clear errors and retrigger steps; and view log files. Each of these capabilities is discussed in the following sections.

In addition, the InputAccel Administration Console provides real-time information concerning batches, modules, steps, licenses, etc. See the online *EMC Captiva InputAccel Administration Guide* for more information about the InputAccel Administration Console.

Remember, changes made to a process file, that is the IAP file compiled in CaptureFlow Designer, will only effect *new* batches. Running batches will continue to use the process file that was in place when the batch was created.

4.1.1 Batch Settings - Tasks

Double clicking on a batch name on the **Batch Traffic** screen of the Administration Console will open the **Batch Settings** detail screen for that batch (see Figure 29). From here, you can determine where the batch is in the process. In this example, the batch is waiting for the Index step. By right-clicking on the status (e.g., **Done**), you can choose **Show Image** and view the scanned image that a step is processing.


InputAccel Administration Console - Batch Settings - Microsoft Internet Explorer provided by [redacted]
http:/[redacted]Secure/AC/Shared/BatchProperties.aspx?BatchID=50701&ServerID=11841!
Live Search
File Edit View Favorites Tools Help
Favorites
Suggested Sites
InputAccel Administration Console - Batch Settings
Page Safety Tools
Print
OK
Done
Local intranet
100%

Batch Settings

Batch - scott-20120119-140724

View Tasks

Tasks

Node	ScanPlus	ImageEnha...	OCR	Index	Documentu...	UpdateDat...
Node 1 - scott-20120119-140724						
Node 2 - Level 6 (1)						
Node 3 - Level 5 (1)						
Node 4 - Level 4 (1)						
Node 5 - Stack 1						
Node 6 - Folder 1						
Node 7 - Document 1						
Node 9 - p. 1	Done	Done	Done	Ready	Not Ready	Not Ready

Figure 29 Batch Settings Tasks Screen

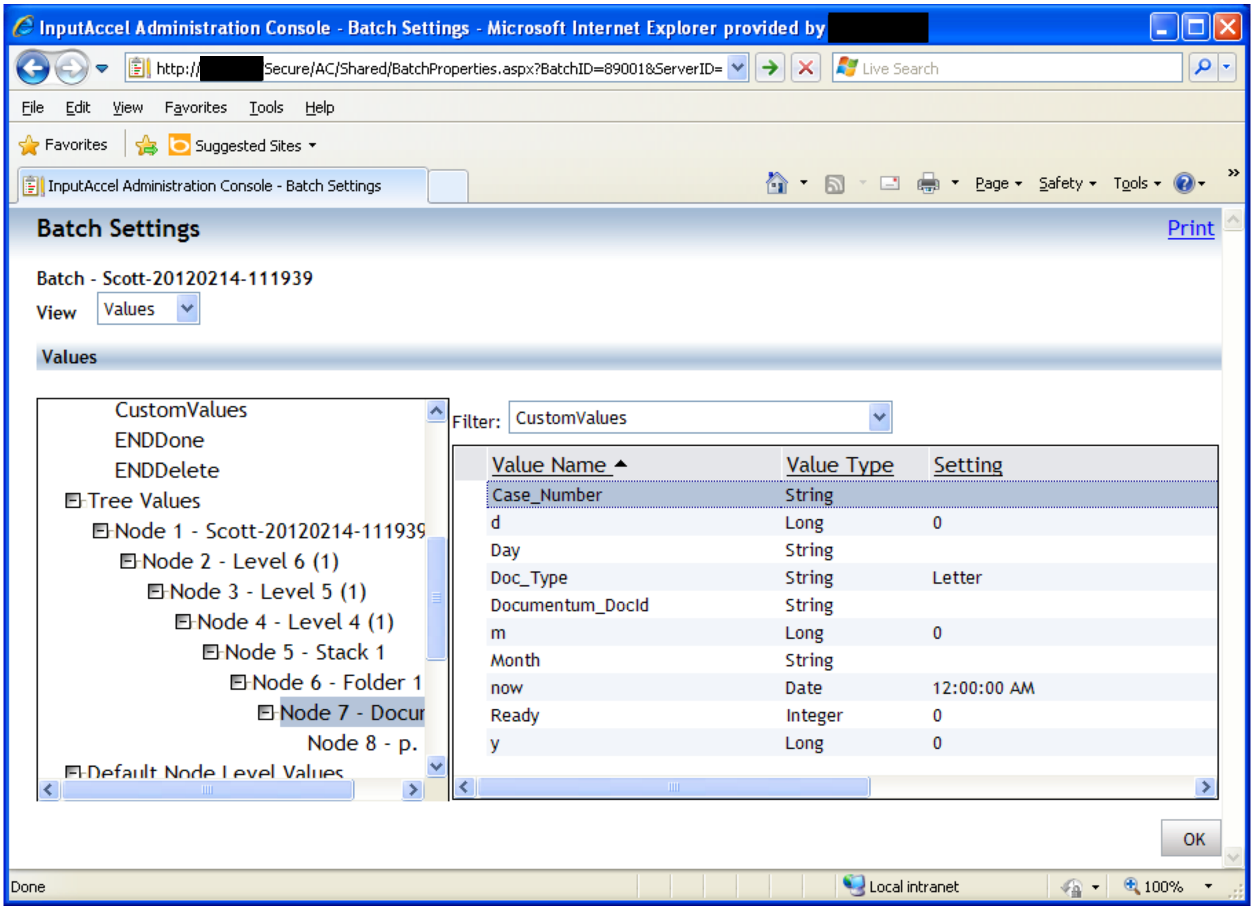
4.1.2 IA and Custom Values

On the **Batch Settings** detail screen, you can change the **View** to **Values** and view all of the IA and Custom Values (see Figure 30). I have found this screen to be extremely beneficial in the debugging processes. The left-hand portion of the screen contains a collapsible tree containing Step Values, Tree Values, and Default Node Level Values. The right-hand pane is the detail area for the node you select on the left.

If you would like to know what value the Image Enhancement step collected for the barcode value, select the **ImageEnhancement** step in the **Step Values** node of the tree, and scroll the right-hand window down to **BarText0** to observe the value.

If you select a node in the **Tree Values** node of the tree, the **Filter** in the right-hand pane becomes active. This will allow you to filter the values displayed for that node by step. In my example, the most useful view is to select the **Node 7 – Document 1** node, and filter on **CustomValues**. This view shows me that the variables I setup in Section 2.2.2 for capturing date elements are working correctly. You can also change a value in this view by right-clicking on it and choosing **Edit Value**. This changed value will now move forward in this process. This is a great tool for correcting a variable what was not set correctly by the process, or to force the process to behave in a certain way. For example, I could enter a **Case_Number** here to cause the process to branch if the document did not contain a **Case_Number** and the process had not advanced beyond the branch.

You can also view the image file, copy it from the server, or replace it with a different file by right-clicking on one of the IA Values that references the image (e.g., **Node 7 – Document.OutputFile1_OutputFile**). This can be useful if you want to view or manipulate an image on your workstation, outside the context of the batch or InputAccel completely.


InputAccel Administration Console - Batch Settings - Microsoft Internet Explorer provided by [redacted]
http://[redacted]Secure/AC/Shared/BatchProperties.aspx?BatchID=89001&ServerID=
Live Search
File
Edit
View
Favorites
Tools
Help
Favorites
Suggested Sites
InputAccel Administration Console - Batch Settings
Page
Safety
Tools
Print
OK
Done
Local intranet
100%

Batch Settings

Batch - Scott-20120214-111939

View: Values

Values

CustomValues
ENDDone
ENDDelete
⊟ Tree Values
⊟ Node 1 - Scott-20120214-111939
⊟ Node 2 - Level 6 (1)
⊟ Node 3 - Level 5 (1)
⊟ Node 4 - Level 4 (1)
⊟ Node 5 - Stack 1
⊟ Node 6 - Folder 1
⊟ Node 7 - Docur
Node 8 - p.
⊟ Default Node Level Values

Filter: CustomValues

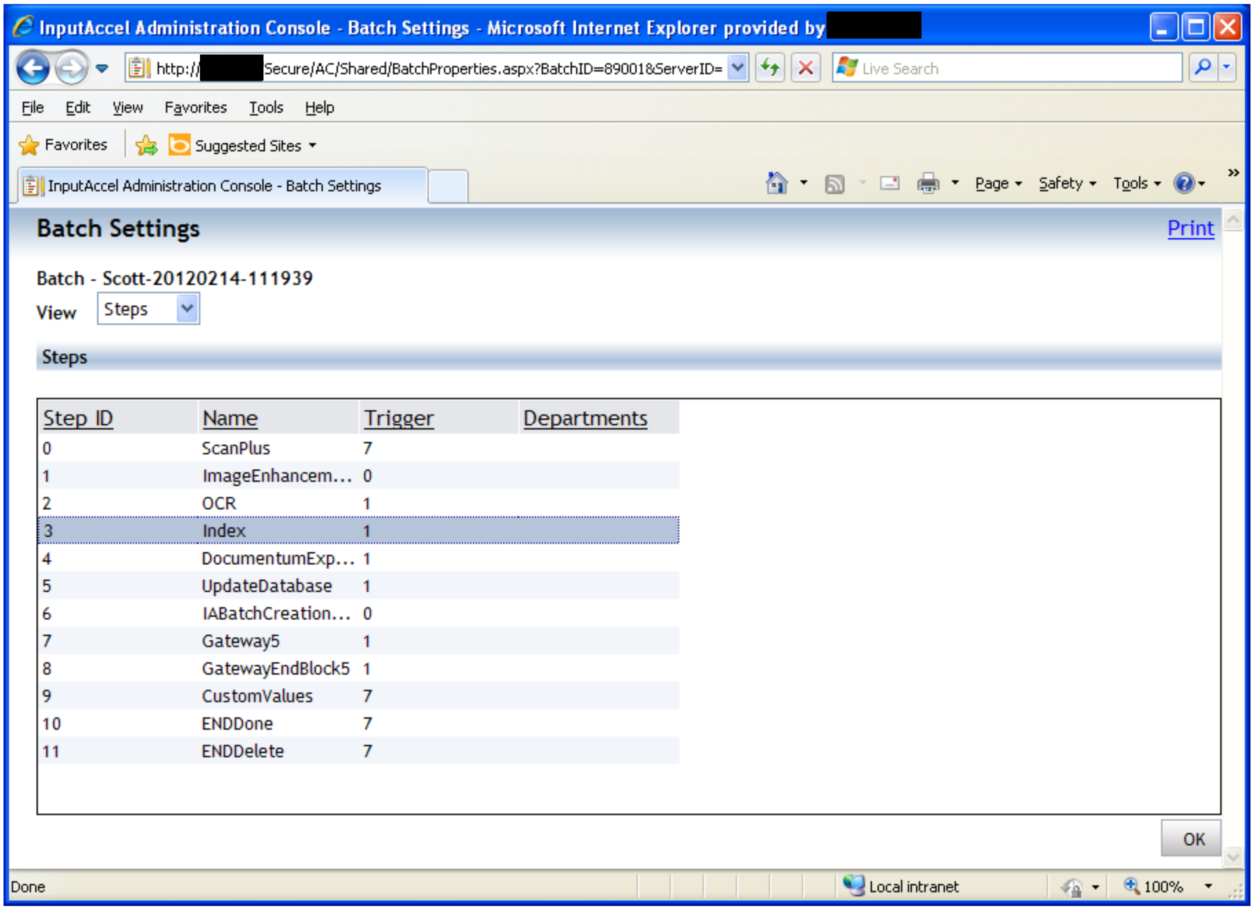
Value Name	Value Type	Setting
Case_Number	String	
d	Long	0
Day	String	
Doc_Type	String	Letter
Documentum_DocId	String	
m	Long	0
Month	String	
now	Date	12:00:00 AM
Ready	Integer	0
y	Long	0

Figure 30 Batch Settings Values Screen

4.1.3 Clearing Errors and Retriggering steps

Changing the **View** on the Batch Settings screen to **Steps** lists the steps in the process (see Figure 31). I haven't found this screen to be overly helpful except for one nice feature. If you have a task that failed a step for some reason you can clear the error and retrigger the step after making adjustments to the IA Values or Custom Values.

To clear an error and retrigger a step, right-click the step and choose **Clear Task Errors** and then **Retrigger**. This will retrigger the step. If you want to skip this step, you can set the IA Value **RetriesLeft** to 0 on most steps and retrigger. There can be ramifications for doing this if later steps in the process depend upon the output of the skipped step; *caveat emptor*.


InputAccel Administration Console - Batch Settings - Microsoft Internet Explorer provided by [redacted]
http://[redacted]Secure/AC/Shared/BatchProperties.aspx?BatchID=89001&ServerID=
Live Search
File Edit View Favorites Tools Help
Favorites
Suggested Sites
InputAccel Administration Console - Batch Settings
Page Safety Tools
Print
OK
Done
Local intranet
100%

Batch Settings

Batch - Scott-20120214-111939

View: Steps

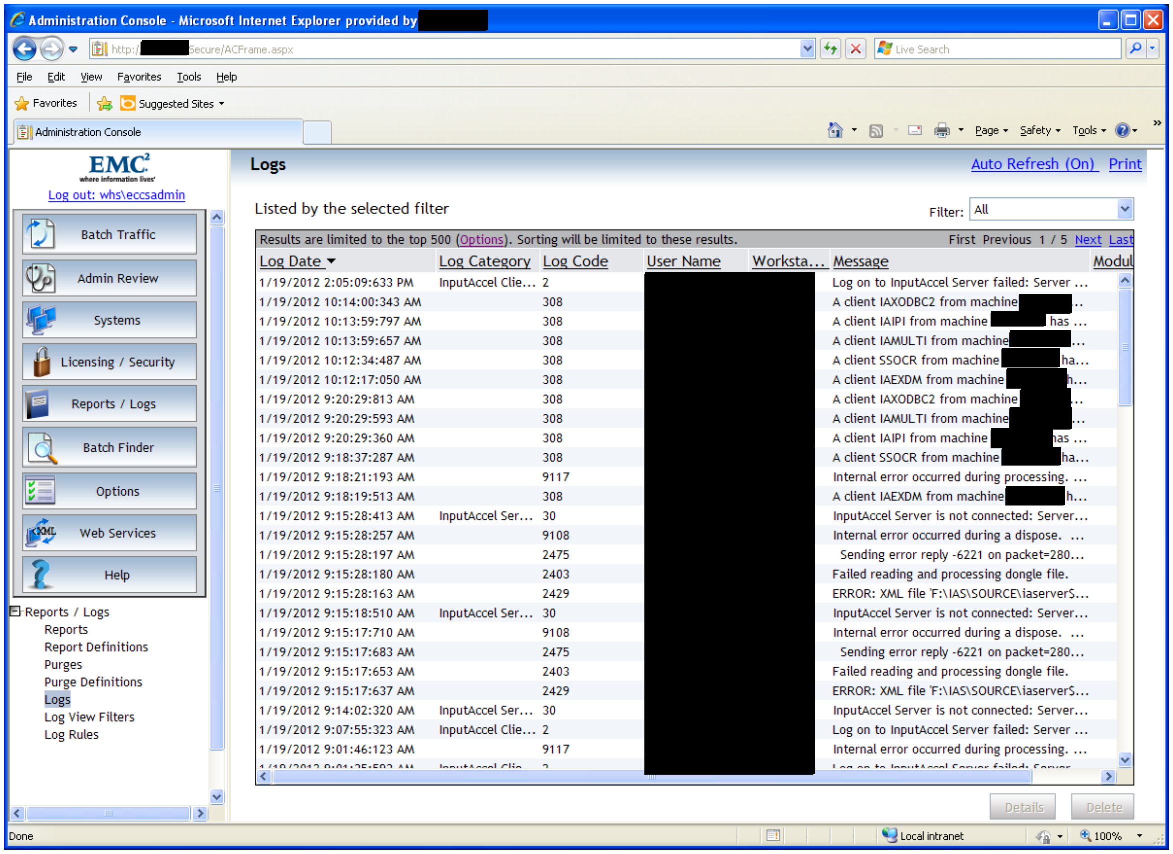
Steps

Step ID	Name	Trigger	Departments
0	ScanPlus	7	
1	ImageEnhancem…	0	
2	OCR	1	
3	Index	1	
4	DocumentumExp…	1	
5	UpdateDatabase	1	
6	IABatchCreation…	0	
7	Gateway5	1	
8	GatewayEndBlock5	1	
9	CustomValues	7	
10	ENDDone	7	
11	ENDDelete	7	

Figure 31 Batch Settings Steps Screen

4.1.4 Logs

The InputAccel server keeps a log of all activities and errors it executes and encounters. The log file can be accessed by clicking the **Reports / Logs** button on the InputAccel Administration Console main page, and then selecting the **View Logs** link (see Figure 32). By default, log messages show up in the far right column. Double-clicking a log entry will open the entry so the details of the message can be viewed (see Figure 33). Unfortunately, sometimes the log messages coming from the modules are incomplete or truncated. Therefore, reviewing the logs is hit-or-miss as far as being a usable debugging tool.



Logs

Listed by the selected filter

Results are limited to the top 500 (Options). Sorting will be limited to these results.

Log Date	Log Category	Log Code	User Name	Worksta...	Message	Modul
1/19/2012 2:05:09:633 PM	InputAccel Clie...	2	[redacted]	[redacted]	Log on to InputAccel Server failed: Server ...	
1/19/2012 10:14:00:343 AM		308	[redacted]	[redacted]	A client IAXODBC2 from machine [redacted]...	
1/19/2012 10:13:59:797 AM		308	[redacted]	[redacted]	A client IAIPI from machine [redacted] has ...	
1/19/2012 10:13:59:657 AM		308	[redacted]	[redacted]	A client IAMULTI from machine [redacted]...	
1/19/2012 10:12:34:487 AM		308	[redacted]	[redacted]	A client SSOCR from machine [redacted] ha...	
1/19/2012 10:12:17:050 AM		308	[redacted]	[redacted]	A client IAEXDM from machine [redacted] h...	
1/19/2012 9:20:29:813 AM		308	[redacted]	[redacted]	A client IAXODBC2 from machine [redacted]...	
1/19/2012 9:20:29:593 AM		308	[redacted]	[redacted]	A client IAMULTI from machine [redacted]...	
1/19/2012 9:20:29:360 AM		308	[redacted]	[redacted]	A client IAIPI from machine [redacted] has ...	
1/19/2012 9:18:37:287 AM		308	[redacted]	[redacted]	A client SSOCR from machine [redacted] ha...	
1/19/2012 9:18:21:193 AM		9117	[redacted]	[redacted]	Internal error occurred during processing. ...	
1/19/2012 9:18:19:513 AM		308	[redacted]	[redacted]	A client IAEXDM from machine [redacted] h...	
1/19/2012 9:15:28:413 AM	InputAccel Ser...	30	[redacted]	[redacted]	InputAccel Server is not connected: Server...	
1/19/2012 9:15:28:257 AM		9108	[redacted]	[redacted]	Internal error occurred during a dispose. ...	
1/19/2012 9:15:28:197 AM		2475	[redacted]	[redacted]	Sending error reply -6221 on packet=280...	
1/19/2012 9:15:28:180 AM		2403	[redacted]	[redacted]	Failed reading and processing dongle file.	
1/19/2012 9:15:28:163 AM		2429	[redacted]	[redacted]	ERROR: XML file 'F:\IAS\SOURCE\iaserver$...	
1/19/2012 9:15:18:510 AM	InputAccel Ser...	30	[redacted]	[redacted]	InputAccel Server is not connected: Server...	
1/19/2012 9:15:17:710 AM		9108	[redacted]	[redacted]	Internal error occurred during a dispose. ...	
1/19/2012 9:15:17:683 AM		2475	[redacted]	[redacted]	Sending error reply -6221 on packet=280...	
1/19/2012 9:15:17:653 AM		2403	[redacted]	[redacted]	Failed reading and processing dongle file.	
1/19/2012 9:15:17:637 AM		2429	[redacted]	[redacted]	ERROR: XML file 'F:\IAS\SOURCE\iaserver$...	
1/19/2012 9:14:02:320 AM	InputAccel Ser...	30	[redacted]	[redacted]	InputAccel Server is not connected: Server...	
1/19/2012 9:07:55:323 AM	InputAccel Clie...	2	[redacted]	[redacted]	Log on to InputAccel Server failed: Server ...	
1/19/2012 9:01:46:123 AM		9117	[redacted]	[redacted]	Internal error occurred during processing. ...	

Figure 32 Logs Screen

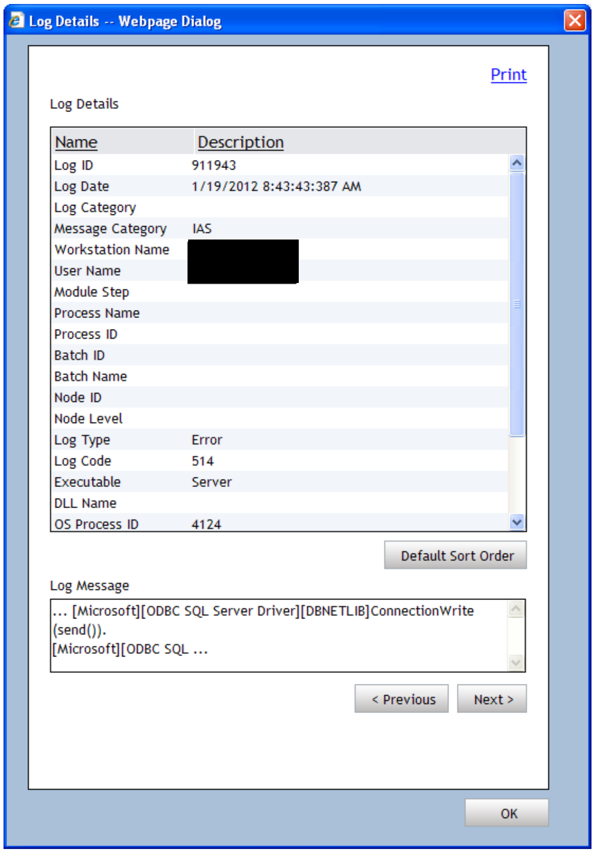
4.2 *The InputAccel Database*

If you have access to the InputAccel database directly, it can be helpful to look at some of the underlying tables and data that power InputAccel.

The Log Screen, discussed in Section 4.1.4, gets its data from the `Tbl_AuditErrorLog` table. Also:

- Batches are maintained in the `Tbl_Batches` table.
- Licenses are maintained in the `Tbl_LicPolicy` table.

There are numerous tables that deal with users, roles, and security as well as reporting. Sometimes, viewing this data directly can aid in debugging a process.



Log Details

Name	Description
Log ID	911943
Log Date	1/19/2012 8:43:43:387 AM
Log Category	
Message Category	IAS
Workstation Name	[redacted]
User Name	[redacted]
Module Step	
Process Name	
Process ID	
Batch ID	
Batch Name	
Node ID	
Node Level	
Log Type	Error
Log Code	514
Executable	Server
DLL Name	
OS Process ID	4124

Log Message

```
... [Microsoft][ODBC SQL Server Driver][DBNETLIB]ConnectionWrite
(send()).
[Microsoft][ODBC SQL ...
```

Figure 33 Log Entry Detail Screen

4.3 InputAccel Reports

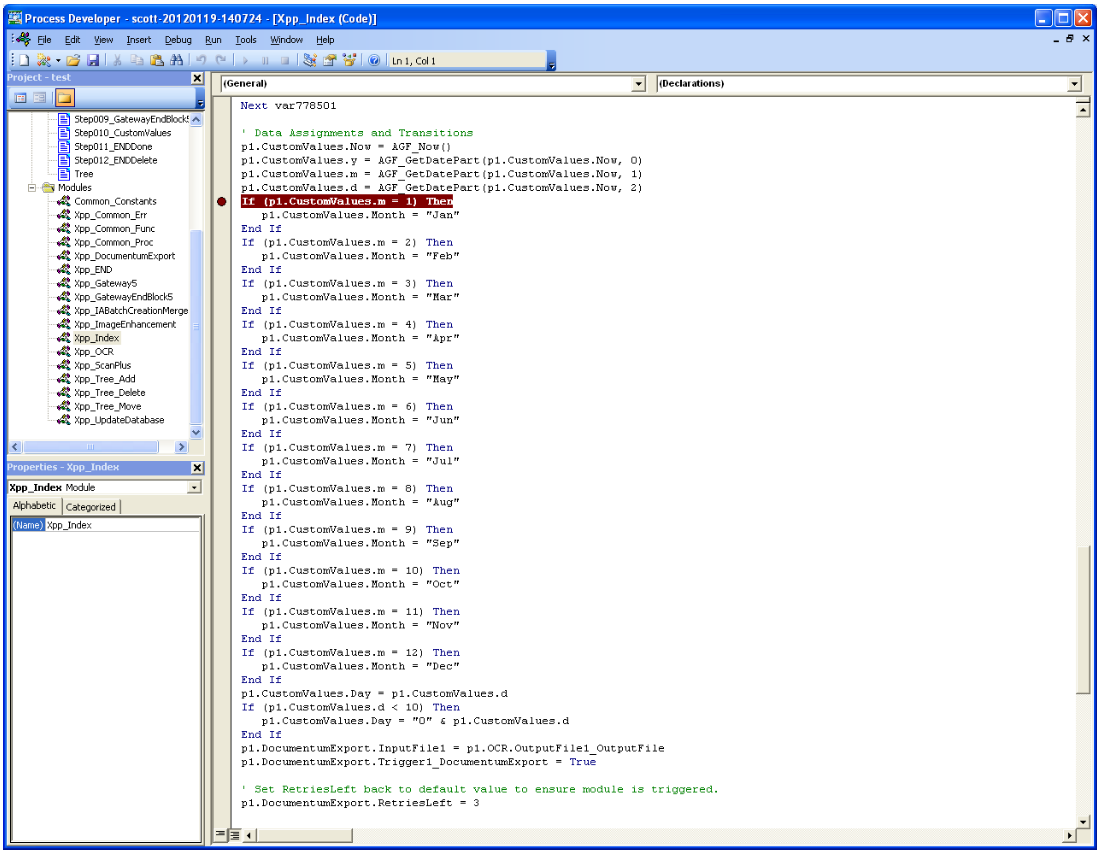
InputAccel comes with a dozen pre-defined report templates and provides the ability for you to add custom Crystal Reports templates if you desire. Configuring reporting is not trivial and is beyond the scope of this paper, but can be a very helpful analytic and debugging tool. For more information about InputAccel reporting, see the online *EMC Captiva InputAccel Administration Guide* (Administration Guide > Using Administration Console > Administration Console Reference > Report Details).

4.4 Process Developer Batch Debugging

One huge benefit of Process Developer is its ability to attach to a running process and debug it step by step. To accomplish this, simply launch Process Developer and select **File -> Open Batch**. You will be prompted to login to InputAccel and then select a running batch. Once the batch loads, you can open **Instance Objects** and **Modules** by double-clicking them in the **Project Explorer** window (see Figure 34). The code you see in the objects and modules is the auto-generated code produced by CaptureFlow Designer. In this example, I loaded a batch created using my example capture process from Section 2.1. The Custom Values I assigned in Section 2.2.3 show up in the `Xpp_Index` module.

You can set breakpoints in this code and step through the logic like with most IDEs. For example, set a breakpoint at the beginning of the code that determines the name of the month (i.e., `If (p1.CustomValues.m = 1) Then`) in the `Xpp_Index` module. Open the IndexPlus module on your workstation and complete the index step. As soon as the IndexPlus module calls the code to complete its processing, your breakpoint will hit and stop the process. You can then step through the code to determine if the name of the month is being properly derived.

Know that changing anything here will only affect the batch you are debugging. You are not making these changes to the process template. This is both good and bad. Good in the sense that you can't "ruin" anything. Bad in that once you figure out a fix, you will have to return to CaptureFlow Designer to implement it.



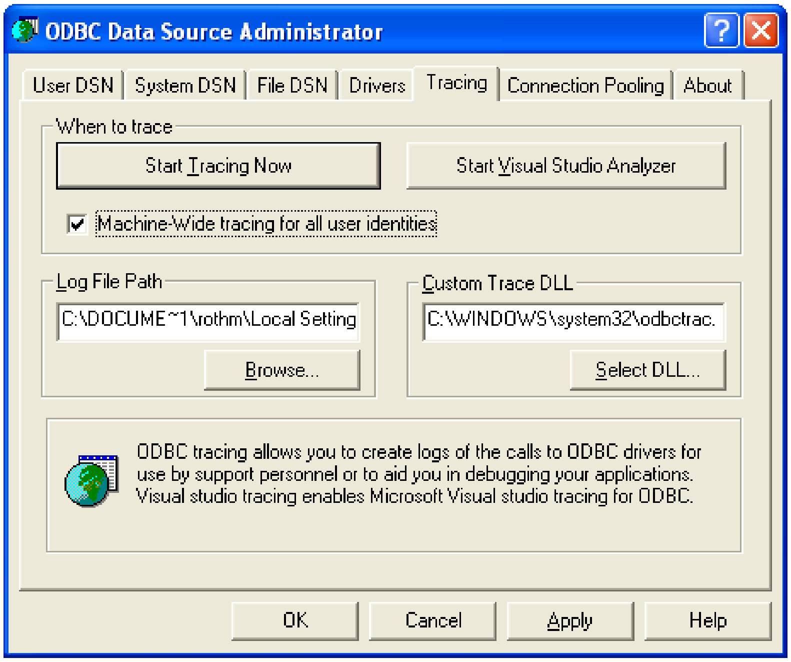
```
Next var778501

' Data Assignments and Transitions
p1.CustomValues.Now = AGF_Now()
p1.CustomValues.y = AGF_GetDatePart(p1.CustomValues.Now, 0)
p1.CustomValues.m = AGF_GetDatePart(p1.CustomValues.Now, 1)
p1.CustomValues.d = AGF_GetDatePart(p1.CustomValues.Now, 2)
If (p1.CustomValues.m = 1) Then
   p1.CustomValues.Month = "Jan"
End If
If (p1.CustomValues.m = 2) Then
   p1.CustomValues.Month = "Feb"
End If
If (p1.CustomValues.m = 3) Then
   p1.CustomValues.Month = "Mar"
End If
If (p1.CustomValues.m = 4) Then
   p1.CustomValues.Month = "Apr"
End If
If (p1.CustomValues.m = 5) Then
   p1.CustomValues.Month = "May"
End If
If (p1.CustomValues.m = 6) Then
   p1.CustomValues.Month = "Jun"
End If
If (p1.CustomValues.m = 7) Then
   p1.CustomValues.Month = "Jul"
End If
If (p1.CustomValues.m = 8) Then
   p1.CustomValues.Month = "Aug"
End If
If (p1.CustomValues.m = 9) Then
   p1.CustomValues.Month = "Sep"
End If
If (p1.CustomValues.m = 10) Then
   p1.CustomValues.Month = "Oct"
End If
If (p1.CustomValues.m = 11) Then
   p1.CustomValues.Month = "Nov"
End If
If (p1.CustomValues.m = 12) Then
   p1.CustomValues.Month = "Dec"
End If
p1.CustomValues.Day = p1.CustomValues.d
If (p1.CustomValues.d < 10) Then
   p1.CustomValues.Day = "0" & p1.CustomValues.d
End If
p1.DocumentumExport.InputFile1 = p1.OCR.OutputFile1_OutputFile
p1.DocumentumExport.Trigger1_DocumentumExport = True

' Set RetriesLeft back to default value to ensure module is triggered.
p1.DocumentumExport.RetriesLeft = 3
```

Figure 34 Debugging in Process Builder

4.5 ODBC Log

If you use the ODBC Export module, as I did in my example process, you can use ODBC Data Source tracing files to help debug interactions between the module and the database. To enable ODBC tracing, open the ODBC Data Source Administrator and click the **Tracing** tab. Click the **Start Tracing Now** button to start tracing (see Figure 35).

ODBC tracing will write numerous messages to the trace file you indicate in the **Log File Path** field. Unfortunately, ODBC trace files are not the easiest files to decipher. However, for gross errors, you should be able to figure out the issue from the entries in this log file.



☑ Machine-Wide tracing for all user identities

Log File Path: C:\DOCUME~1\rothm\Local Setting

Custom Trace DLL: C:\WINDOWS\system32\odbctrac.

ODBC tracing allows you to create logs of the calls to ODBC drivers for use by support personnel or to aid you in debugging your applications. Visual studio tracing enables Microsoft Visual studio tracing for ODBC.

Figure 35 ODBC Tracing

4.6 IA Server Debug Mode

You can log debug information about several of the InputAccel client modules by setting `IAClientDebug = 1` in the `C:\Documents and Settings\All Users\Application Data\EMC\InputAccel\settings.ini` file. This setting will create a log file named `c:\iaclient.log`.

Also, many of the InputAccel modules have the option to save a log file if they are run in client mode (as opposed to unattended mode).

4.7 SQL Server Profiler

If you are using Microsoft SQL Server as your InputAccel database, you can use the SQL Server Profiler tool available from **Tools** menu of the Microsoft SQL Server Management Studio to capture and analyze queries InputAccel submits to the database. Though a laborious process, occasionally you can capture an errant query.

5 Wrap Up

My experience with InputAccel has been strictly trial and error; I did not attend any training classes, in-person or otherwise (perhaps it shows). Outside of some email and phone calls with an EMC Captiva engineer whom I know personally, and a fellow engineer at Armedia with extensive Captiva experience, my project was successfully accomplished by me trying and testing anything and everything that seemed reasonable. In the end, I think development and deployment of my InputAccel project was relatively simple, it just took a while to get there.

Having struggled with the environment, the architecture, the paradigms, and concepts encapsulated by InputAccel, I have formulated a few suggestions that I think would make developing InputAccel solutions easier and more intuitive.

If CaptureFlow Designer is the central tool for development, then all activities involved with development should be brought into the tool. For example:

- You should be able to install a process from CaptureFlow Designer after it has been compiled. Process Developer allows you to do this.
- After a process has been installed, you should be able to launch each module for setup from CaptureFlow Designer to continue the development process.
- CaptureFlow Designer should provide the same debugging facilities as Process Developer; specifically, step-by-step debugging of a batch, and the ability to load an exported batch.
- CaptureFlow Designer needs a better built-in facility for creating "Scripts" for modules that is more on par with the capabilities of Process Developer.
- Log rules and reporting should be more intuitive and f possible, brought into the CaptureFlow Designer tool.

Perhaps some of these capabilities will be realized in Captiva v7 expected late in 2012.

This document contains the extent of my experiences and best practices (as I have come to know them). Hopefully the knowledge I have gained will be helpful to someone as green as I was when I started my project.

5.1 Advanced Topics

Before wrapping this up, I'd like to briefly visit some advanced topics; there are four I think are important to mention: logging and reporting, module scripting, custom modules, and web services. All of these topics and others are covered in the online help files distributed with InputAccel.

5.1.1 Logging and Reporting

As I briefly touched on in Section 4.1.4 and Section 4.3, InputAccel has a substantial logging and reporting facility. It is possible to create custom logs and log filters to view and track information pertinent to your process. It is also possible to include some IA and Custom Values in these logs.

InputAccel also has a reporting facility that allows you to create and run canned or custom reports using Crystal Reports. These reports typically have a more sophisticated layout than log files, and usually operate on data generated between two dates, as opposed to log files which are open ended.

Creating and configuring reports and logs is not trivial, but worth the investment to understand the process.

5.1.2 Module Scripting

Most of the InputAccel modules have a **Scripting** tab which allows you to write custom processing code to be invoked when certain events occur within the module. This capability harkens back in some ways to the abilities provided in Process Developer for writing custom code. However, the tool for developing this code is little more than a text editor with no autocompletion built-in. Therefore, without extensive knowledge of the InputAccel class model and API, you are left virtually clueless. That said, mastery of InputAccel at this level could yield some exceptionally powerful results.

5.1.3 Custom Modules

It is possible to write your own InputAccel modules to perform specific tasks or functions. For example, automatically rotating an image 90 degrees, or exporting data to a non-ODBC-compliant database, or applying rights management to a scanned document. The best description I have found of doing this is in EMC engineering solution note ESG108510. There are also some helpful examples in the `..\InputAccel\Client\src\Scripts\ Samples\` directory.

5.1.4 Web Services

InputAccel also has the capability to provide and consume web services. This allows your scanning environment to easily traverse the globe and provide scanning capabilities over the Internet or private WAN. Web service setup and configuration is addressed in the *EMC Captiva InputAccel System Overview: The Basics of InputAccel* guide as well as the online *Web Services Scripting API Reference* guide.

5.2 Thanks

I want to thank Lee Grayson (Armedia) for his longsuffering patience with me and expert help in getting me through my first InputAccel project. Much of what I learned and documented here was from Lee or based upon knowledge I gained from one of his suggestions. I also want to thank Jesse Rauch (EMC\Captiva) for all of his help, suggestions, and support with my project.

5.3 About the Author

M. Scott Roth is a Director of Technology at Armedia, LLC. Mr. Roth has been in the enterprise content management business for 15 years and maintains a blog dedicated to capturing and sharing tips related to Documentum at http://msroth.wordpress.com.

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