

# The Global Reports Monitor Enhancements



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*Sponsored by:*



**BARCLAYS**



**WPI**

# The Global Reports Monitor Enhancements

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## A Major Qualifying Project Report

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Degree of Bachelor of Science

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## **Abstract**

This project was sponsored by Barclays' Agency Derivative Clearing Services group within the Investment Bank division. The team worked on a user interface, the Global Reports Monitor (GRM), which is used for report configuration to produce customized reports for Barclays' clients. The goal of the project was to make the GRM more user-friendly, enabling its users to become more self-sufficient. The team added new functionality and implemented fixes in the GRM so additional operations can be completed without IT assistance.

## Acknowledgments

We would like to thank everyone who helped with this project and enabled us to have this valuable experience.

We would like to thank everyone from Barclays for their willingness to work with us and contribute to this project. In particular, we would like to thank Greg Friel for sponsoring our project, and our on-site liaison, Loren Taylor, who oversaw our work. We also appreciate the time Manish Raikar and Srinivnas Malla invested in helping us understand the GRM and the desired improvements, as well as Rahul Sharma, Sundeep Ahuja, and Ankur (Roy) Sinharoy for taking the time to review our work.

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## Executive Summary

Barclays is a major banking and financial services firm headquartered in London. The firm offers extensive services to 48 million clients worldwide. The Agency Derivatives Clearing Services (ADCS) group of the Investment Bank division maintains a platform, EPAS, which enables Barclays' client services to create a wide range of reports for their external clients. The Global Reports Monitor (GRM) is the graphical user interface (GUI) of this platform, and allows the user to customize the information contained in these reports. The GRM is very flexible, allowing client services to cater to the individual needs of their clients. However, the GRM was originally created for the use of its developers; consequently it is not very user-friendly, and these developers have since left the company. As a result, the GRM currently has several broken features, is missing screens, and is lacking important functionality.

In the current workflow, a client of Barclays goes to Client Services with a request for a report containing specific information. Client Services then uses the GRM to fulfill this request. If they cannot complete the request, they go to IT for support. IT then has to configure data from the back-end or manually run SQL scripts to create a solution. This results in the workflow illustrated in Figure 1. This process is inefficient because it takes time for IT to create a solution and to communicate with Client Services.

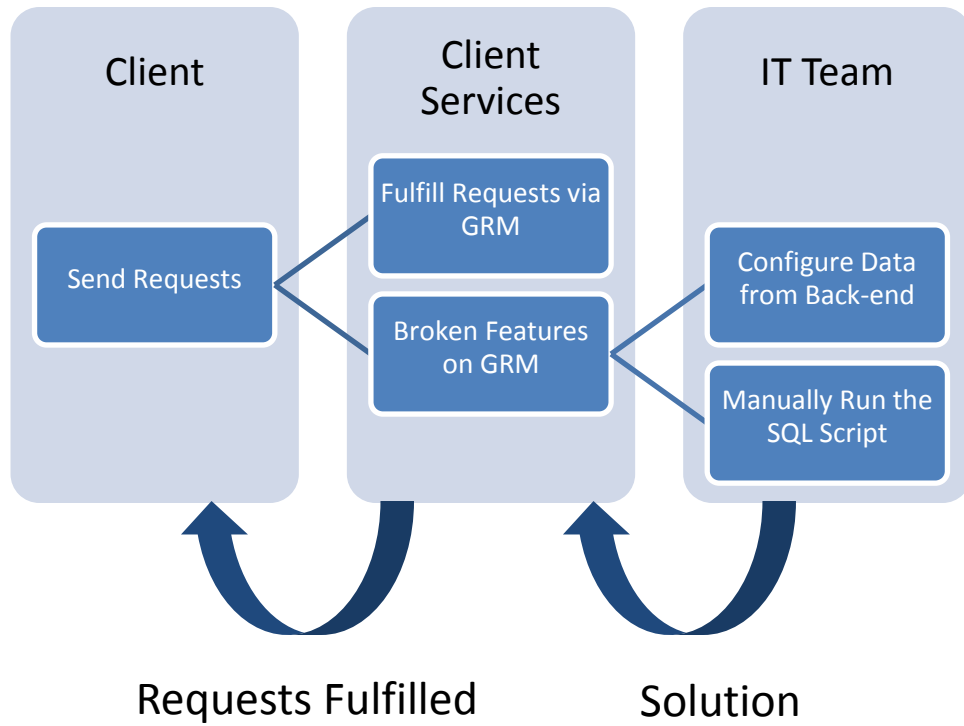


Figure 1: Current Workflow

Our team was brought in by Barclays to make the GRM more self-sufficient for Client Services in order to improve this workflow. The ideal workflow is demonstrated in Figure 2. In order to accomplish this, the primary goal of the project was to implement enhancements that would enable users to complete more tasks without needing to involve IT. Secondary goals were to create new screens and repair broken features.

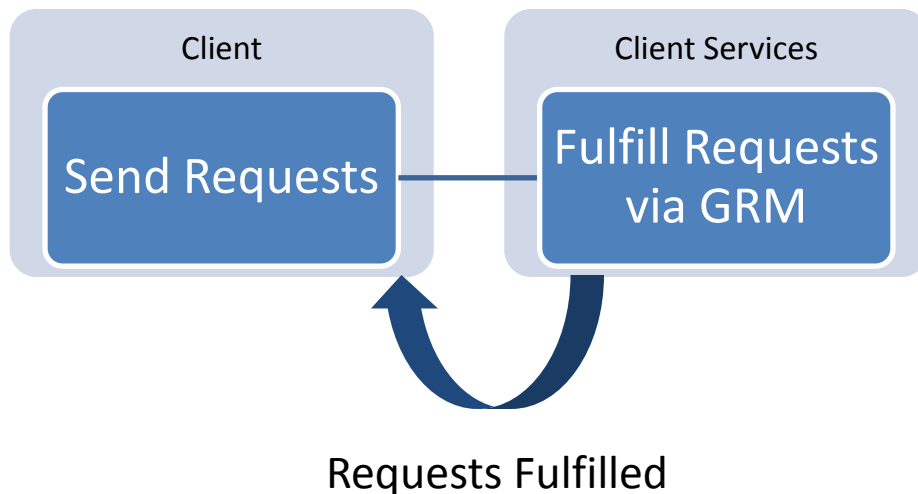


Figure 2: Ideal Workflow

Based on the priorities of the sponsor, the team implemented several enhancements which are listed in Figure 3. The first and most important enhancement we implemented was the cloning feature. This feature allows the user to employ an existing report as a template for another client. We created a five step wizard that walks the user through each step needed to clone the report. After completing the cloning function, we created several new screens and repaired broken features to enable Client Services to manage data mapping and other operations without the help of IT. Finally we implemented an auditing system for some of these functions so that changes to the database can be tracked and referenced.

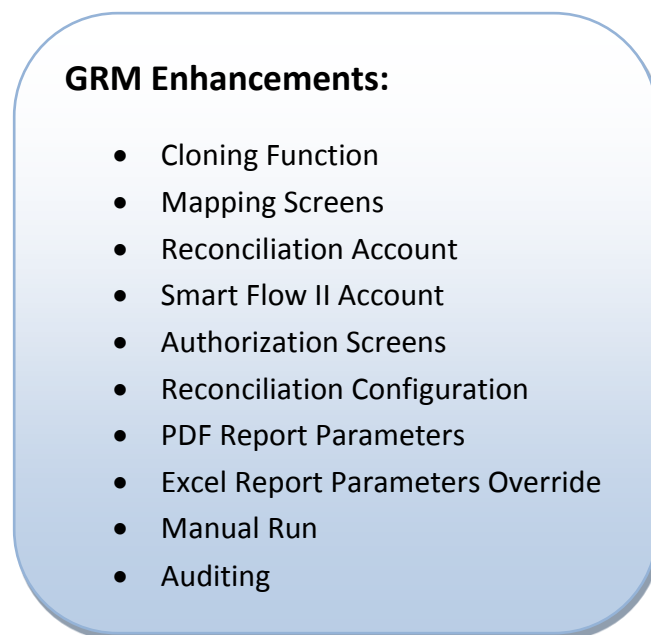


Figure 3: GRM Enhancements

These enhancements benefit Barclays by enabling the firm to provide better service to its clients. The GRM is now more user-friendly and promotes greater self-service. By giving greater functionality to the user, the need for the involvement of IT is also reduced, thus minimizing IT's workload.

In order to complete this work in our short time at the firm, the team utilized the Scrum development approach. Scrum is an Agile form of project management that enabled the team to work efficiently and effectively. For each enhancement we followed a similar approach and went through five stages: understanding the requirements, creation of the user interface (UI) design, implementation, testing, and review. This allowed the team to ensure each enhancement met the standards of the sponsor.

During our time at Barclays, we were able to gain real world experience in a major banking firm. We were able to create solutions of real business value and learn important technical skills that will benefit us in our future endeavors. We also overcame the challenges of working in an interdisciplinary group to develop an efficient and organized team.



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## Chapter 1: Introduction

Barclays is a British banking and financial services firm founded in 1690 in London. It is a leader in innovation in the financial services industry and has grown to serve 48 million clients in over 50 countries worldwide. The firm provides a wide range of services and employs 132,300 people in Europe, Africa, the Middle East, Asia Pacific, and the Americas. This project was sponsored by Barclays' Agency Derivatives Clearing Services (ADCS) group in the Investment Bank division in their New York City office.

ADCS is responsible for the EPAS platform which contains all of the data used for bespoke client reporting. The Global Reports Monitor (GRM) is the user interface for this platform and is used for report configuration. The GRM is used daily to configure thousands of reports for both internal and external clients. These include end of day and intraday reports on client reconciliations, activity, positions, and balances among other types of data. Barclays' external clients will go to Client Services with a request for a report containing specific information. Client Services then uses the GRM to configure that report with the specific parameters requested by the client. If the report cannot be generated by the GRM, Client Services will take the request to IT, and the IT team will have to fulfill the request. This communication between Client Services and IT takes time, delaying the production of reports for Barclays' clients. It also generates a significant amount of work for IT as they have to fulfill all these requests manually. This need for the involvement of IT is created in part by absent functionality, missing screens, and broken features within the GRM.

Our team worked on the GRM to resolve some of these issues and add functionality. The goal of the project was to improve the GRM so that report configuration can be completed

without requiring interaction with IT. We accomplished this through three categories of enhancements. First, we added a new cloning feature which gives Client Services the ability to clone an existing report, so that a report template that has already been created for one client can be used for another. The second type of enhancement we implemented was the addition of several new screens. These new screens provide a user interface that Client Services can utilize to accomplish tasks that IT previously had to do in the back end. Finally, on some existing screens there were broken buttons that did not perform their intended functions. We enabled these buttons which will again decrease the reliance on IT, and also greatly reduce the request response time for clients. All of the enhancements we implemented are individually described in *Chapter 4: The Global Reports Monitor Enhancements* of this paper.

The process we used to implement each of these enhancements as well as an explanation of our implementation of Scrum is outlined in *Chapter 3: Methodology* of this paper. Before the project began, we familiarized ourselves with several different technologies that were used throughout the project. We also researched the Scrum development approach in order to effectively implement it within our own team and understand the management approach of the Barclays team. This research as well as information on Barclays and the EPAS platform and the GRM is included in *Chapter 2: Background* of this paper.

## Chapter 2: Background

This chapter provides detailed information on the background research done by the team to provide the foundational knowledge needed to complete the project. The first section includes background on the firm and the second provides a general overview of the platform and user interface this project focused on. The third contains information on all the technology the team utilized, and the final section is an overview of Scrum, the development approach that we used.

### 2.1 Barclays

Founded in 1690 in London, Barclays is a major international banking and financial services firm. It provides a number of services including corporate and investment banking, wealth management, and retail banking. With a worldwide presence, the company currently serves 48 million customers and clients in over 50 countries. Barclays has £1.358 trillion in total assets and employs 132,300 people around the world. Its employees strive to fulfill the mission of “helping [their] clients and customers achieve their ambitions in the right way” (“Our history,” n.d.) through their core values of respect, integrity, service, excellence, and stewardship. As a result of their commitment to their mission and values, Barclays has succeeded in becoming a leader in innovation in the financial services industry (“Our history,” n.d.).

## **2.2 EPAS and the Global Reports Monitor**

The Agency Derivatives Clearing Services group, which is responsible for Futures Clearing at Barclays, maintains the EPAS platform which contains all of the data pertaining to customized client reporting. It primarily focuses on reports on futures, options, OTS trades/positions/balances, and reconciliation.

The Global Reports Monitor (GRM) is the graphical user interface (GUI) for EPAS. It is used for report configuration, and it allows users to check the status of jobs. Its flexibility allows users to create different types of report templates and customize them to fulfill the needs of individual clients. Our team worked primarily on the FileExporter portion of the GRM, which allows users to configure customized report templates and send them to the selected recipients.

## **2.3 Technology Review**

Each subsection of this section addresses a different technology used in this project. It includes the technologies used for creating workflow designs, producing mockups of user interface (UI) designs, and coding.

### **2.3.1 JIRA Software**

JIRA is a proprietary issue tracking product, developed by Atlassian. It provides bug tracking, issue tracking, and project management functions for Agile teams (“JIRA Software,” n.d.). Our team used JIRA for project management and bug tracking.

### **2.3.2 Visio**

Visio is a Microsoft Office product used to create clear, professional diagrams. It is an intuitive application that enables the user to quickly create visual representations of a wide variety of information (“Work visually,” n.d.). Our team used Visio to create workflow diagrams of the processes being created in the GRM. It allowed us to clearly represent our understanding of the desired workflow of the sponsor in order to clarify and ensure that everyone was on the same page.

### **2.3.3 Balsamiq Mockups**

Balsamiq Mockups is an easy to use mockup tool that allows users to create quick, clear mockups of their UI designs. It creates digital sketches of the desired design that can be used for collaboration between designers, managers, and developers (“Rapid, effective and fun wireframing software,” n.d.). Our team used Balsamiq Mockups to create mockups of UI designs before implementing them. These designs could then easily be taken to the sponsor for review and refinement.

### **2.3.4 Visual Studio**

Visual Studio, an integrated development environment (IDE), was developed by Microsoft for creating applications. It includes a code editor, debugger, and supports most programming languages (“Visual Studio – Microsoft Developer Tools,” n.d.). We used the Visual Studio environment for all of our coding.



### **2.3.5 The .Net Framework**

Developed by Microsoft, the .Net Framework is a software framework that supports building and running applications and XML Web services. It provides a comprehensive development environment with memory management and a vast class library of reusable code (“.NET,” n.d.). We did all of our coding within the .Net Framework.

### **2.3.6 C#**

C# is a programming language developed by the Microsoft Corporation as a part of its .NET project. It is an object-oriented language used by developers to create applications that run on the .NET framework. The syntax is similar to C++ and Java, making it easy to learn for developers with experience in those languages (“C# Programming Guide,” n.d.). C# was used for all the back-end coding in the project.

### **2.3.7 Ext JavaScript**

Ext JavaScript is a pure JavaScript application framework for building interactive cross platform web applications using techniques such as Ajax, DHTML and DOM scripting. Our team utilized Ext JS for the front-end scripts in the project (“JavaScript Frameworks in the Real World,” n.d.).

### **2.3.8 Perforce**

Perforce is a revision control system used for collaboration between developers. It allows teams to work on projects concurrently and merge their code without creating conflicts

(Perforce Software: Connect teams, protect IP, support rapid releases,” n.d.). Our team used Perforce to collaborate on all the coding for this project.

## **2.4 Development Approach – Scrum**

Barclays utilizes Scrum as their development approach, and we also adopted this method. Scrum is defined as “a framework within which people can address complex adaptive problems, while productively and creatively delivering products of the highest possible value” (Sutherland & Schwaber, 2013). The framework consists of a team structure and an event structure. This framework allows the team to efficiently work through the Product Backlog, which is the list of all the items that need to be addressed. This includes all enhancements and fixes to the product.

The Scrum Team includes a Product Owner, Scrum Master, and Development Team. The Product Owner is responsible for optimizing the value of the work produced by the team. This includes prioritizing the Product Backlog, and ensuring items are communicated and effectively explained to the Development Team. The Scrum Master supports the Product Owner by facilitating Scrum events, assisting with Product Backlog management, and helping the Development Team utilize the Scrum methodology effectively. The Development Team is a self-organizing team that works together to deliver the required enhancements and fixes to the product.

Scrum events are organized around Sprints. A Sprint is a set period of time during which the team produces a useable product Increment. An Increment is the set of Product Backlog

items completed in the current and previous Sprints. Each Sprint includes Sprint Planning, Daily Scrum, Sprint Review, and Sprint Retrospective meetings.

In Sprint Planning, the Scrum Team determines what will be delivered during the upcoming Sprint, and how the work required for this delivery will be completed. The Daily Scrum is a 15-minute meeting used to review the last 24 hours, and plan for the next 24 hours. Each member of the Development Team goes over what they accomplished yesterday, what they will do today, and any barriers they foresee that might prevent themselves or the Development Team as a whole from accomplishing their goals. The Sprint Review is held at the end of the Sprint with the Scrum Team and any stakeholders the Product Owner invites. The purpose of the Sprint Review is for the Development Team to demonstrate the work completed during the Sprint and to discuss what was successful, what was problematic, and how any issues were resolved. This meeting is also a time for stakeholders to provide input on the work done, as well as their opinions on upcoming work. This input is valuable for the Product Owner in prioritizing the Product Backlog, and for the Development Team in understanding the requirements for the upcoming work. The Sprint Retrospective serves as a time for the Scrum Team to reflect on its performance and identify opportunities for improvement. The team as a whole discusses these opportunities and identifies specific goals for improvement during the next Sprint (Sutherland & Schwaber, 2013).

## Chapter 3: Methodology

This chapter describes the management approach and enhancement process used to accomplish the goals of the project.

### 3.1 Project Management

Our team used the Scrum development approach during the project. Our sponsor liaison, Loren Taylor, served as the Product Owner, and Carolyn Tang served as the Scrum Master. The whole student team comprised the Development Team.

The team operated under one week Sprints, and weekly planning meetings were held at the beginning of each Sprint with the Product Owner to plan for the upcoming Sprint. Weekly Sprint Retrospective meetings were held among the team, as well as Daily Scrum meetings. These meetings allowed us to internally plan, coordinate, and analyze our progress. The Sprint Review was held weekly with the team, sponsor liaison, and project advisors. This meeting provided time for us to demonstrate our progress to the sponsor and advisors as well as receive feedback, direction, and advice.

We utilized JIRA to record our tasks and subtasks. A team member was assigned to each task, and the estimated time for completion and current status were recorded and kept up to date. This allowed the team to easily see everyone's progress, and the work that needed to be completed for each Sprint.

### 3.2 Remote Team Dynamics

In today's global economy many Wall Street firms have developed significant personnel resources in low cost centers. Consequently, many teams, including the one we worked with at Barclays, have members spread across the globe. While we worked in Manhattan where one half of the team is located, the other half of the team is based in Pune, India. As a result, in addition to the experience of working in an office setting in Manhattan, we also had the opportunity to experience working with a remote team. The lack of in-person communication and a 10 ½ hour time difference created unique dynamics and challenges that we were able to learn from and adapt to. Therefore, flexibility was vital for our team. Occasionally, the developers in Pune had to work later than normal working hours and we had to come in earlier to accommodate the time difference. It also made effective communication very important during the short window when everyone was at work.

Not only did our team have the opportunity to work with remote developers, but we were also supervised by remote advisors. The team and advisors used several tools to maintain communication. Communication was primarily done through our weekly advisor meetings via conference call. To assist in these meetings we utilized WebEx, a remote screen sharing software, which allowed us to demonstrate our progress and accomplishments. In addition to these weekly meetings, some of the advisors joined us for more informal on-site visits that allowed us to have face-to-face conversations. A key ingredient of successful remote teams is everyone's willingness and ability to maintain availability for communication. Because the advisors were not on-site and not available for in-person communication, responding quickly to emails became a vital part of the team's success.

### **3.3 Enhancement Process**

A similar approach was used for each enhancement. Each subsection of this section describes one of the five stages in this process. Multiple tasks were frequently worked on simultaneously with different team members working on different stages in order to maintain an efficient workflow.

#### **3.3.1 Understanding the Requirements**

The first step in the process for each enhancement was understanding the requirements. We met with someone from the Barclays' team to review what they would like to see added or fixed in the GRM. They would explain the current state of the operation in the GRM including any issues they were aware of. They would then explain what they would like the new functionality to include. Then we would ask clarifying questions and confirm that we had a good working understanding of the goals and expectations.

#### **3.3.2 Creation of the User Interface Design**

Once our team had a good understanding of the requirements, we would move into the creation of the UI design. We would produce mockups of our proposed design, and consult with the members of the Barclays team to revise and improve these mockups. An example of a mockup is shown below. When the mockups had been finalized the team would move into the implementation phase.

**Instrument**

InstCodeConv

SrcID Client Name Unmapped Instrument Search Client Copy Mappings Update InstCode Record Multiplier

ClientName	SrcID	ConvType	Exch	Instrument	Ccy	InstCodeId	Descr
AAAA	112	0		ED	EUR	1	ED
AAAA	113	0		L		50	L
AAAA	114						ED
AAAA	115						L
AAAA	116						ED
AAAA	117						L
AAAA	118						ED
BBBB	119						L
BBBB	120						ED
BBBB	121						L
BBBB	122						ED
BBBB	123						L
CCCC	124						ED
CCCC	125						L
CCCC	125						ED
CCCC	127						L

**Copy Mapping By Instrument**

Search

Source SrcId\*: 125 Instrument (optional): L

Source Client\* Client Name

All  
AAAA  
BBBB  
CCCC

\*Only One is required

Search Client

Results

SrcId	ClientName	InstCodeId	Instrument	Exch	Ccy	Descr
125	CCCC	40	L		EUR	30DAY
127	CCCC	50	L		EUR	30DAY

Copy Mapping Cancel

Possible Copy Mapping Options By Product:

Apply Option2.

MatchCriteria	InstCod	Co	Exc	Cc	MarketSe	Des	SecurityT	Count	TickSi	Value1	ContractSize	LastUpd	FK	OK	OptionsC
Matched by	101	L	LIF	GB	Comdty	90D	GB	0.01	1250	5000	Mon March 01				
Matched by	222	L	LIF	GB	Comdty	60D	GB	0.01	1250	5000	Mon March 01				
Matched by	333	L	LIF	GB	Comdty	30D	GB	0.01	1250	5000	Mon March 01				

Figure 4: Mockup Example

### 3.3.3 Implementation

When the design was complete our team implemented it in the provided testing environment. The level of our involvement varied in this stage. The implementation involved in creating new functionality required considerably more effort than when we were able to work with a feature that already had some functionality. Because of this, we tried to use the existing features in the GRM to serve as templates for our own work so we could get more accomplished.

### **3.3.4 Testing**

When our team believed the implementation was complete, we would move into the testing phase. This involved testing by the team to ensure that the intended functionality was complete and appeared as it should. If it did not pass all of the testing it would be pushed back to implementation and issues would be resolved before returning to testing. This was repeated as necessary until the team was confident the enhancement was working properly. It would then be presented to the sponsor for final review.

### **3.3.5 Approval**

The final step in the process was obtaining approval from the Product Owner. When our team felt the enhancement was functioning as it should, we would present it to the Product Owner and the development team through a WebEx meeting. Sometimes it would then get sent back to improve the implementation and have further testing done. When they felt it was complete, they would approve it, and we would move on to the next task. As with all the stages, we would continue to work on other tasks while waiting for feedback and approval.



## **Chapter 4: The Global Reports Monitor Enhancements**

This chapter details the improvements and fixes to the GRM that the team implemented during the project. There are three major types, including creating the new cloning feature, adding missing data screens, and repairing and adding new functionality to existing pages. Each section addresses a different enhancement type, and each sub-section includes a specific enhancement.

### **4.1 Cloning Feature**

The first enhancement completed by the team was the addition of a cloning feature to the GRM. This is a completely new feature in the GRM, and allows the user to clone an export from one client to another so IT does not need to be involved. The clone process is currently done in the back-end by the IT team, who has to manually run SQL scripts to complete the process. The current workflow of cloning a report is shown in Figure 5.

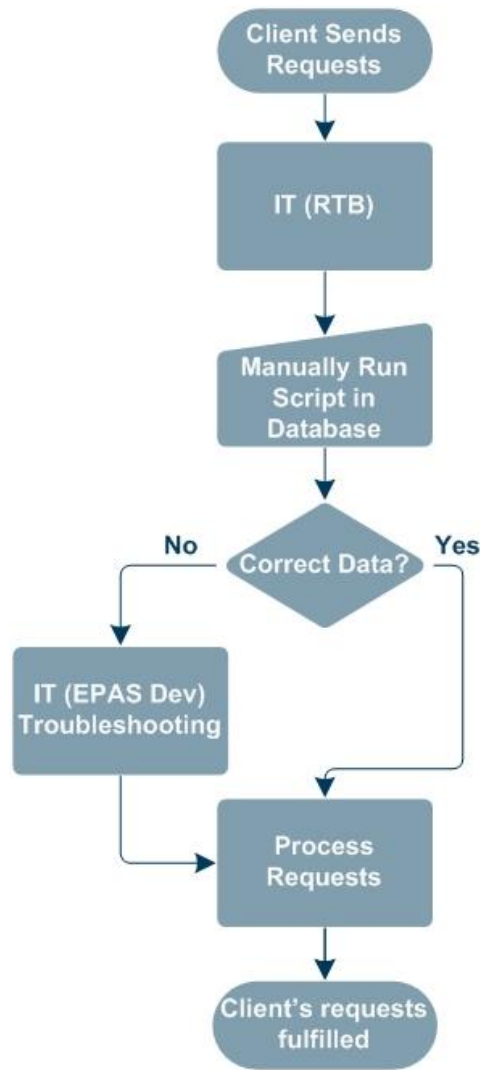


Figure 5: Previous Clone Workflow

The new cloning features allows the Client Services team to take a report template created for one client and use the same template to generate a report for another client, eliminating the need for IT in this situation. The team designed and implemented a wizard for the user interface so that when a user chooses to clone a report they can step through the wizard and make any desired changes to the template. By using the clone wizard, the workflow of cloning a report is improved and optimized as shown in Figure 6.

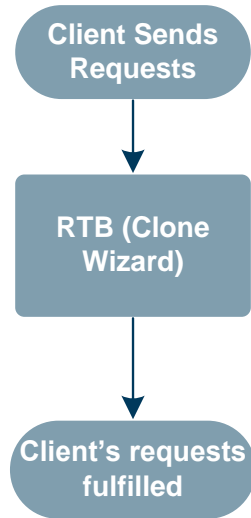


Figure 6: Optimized Clone Workflow

The wizard is by default populated with the settings of the cloned report; however the user is required to change fields that are typically specific to the client such as the file name. The cloning wizard includes five pages. On the first page the user can select the client they wish to clone the export to. They can also change various other parameters, such as category, file type, and interval. The second page requires the user to choose which reports from the original export they would like to include in the new, cloned export. They can also select a particular report and edit it to change the name, type, and delivery mechanisms. On the third page the user can set all of the email delivery settings such as the subject and mail group. The fourth step then allows the user to attach the files to the email, and the final step allows the user to review all the information they entered in the first four steps. On the final page they are also able to edit any of the information entered in the wizard with the exception of the client the user is cloning to. In order to change the client, they can use the previous arrows at the bottom of the page to go back through the pages to the first step. They must return to the first page because other fields are dependent on the client, and those fields will have to be adjusted if the

client is changed. They are also able to change the inputs in previous pages, and all the changes will be temporarily saved in the webpage, so users will not lose any changes they entered on the in-between screens.

Once the user has submitted the cloned report, another user can go to the publisher in the maintenance portion of the GRM to approve it. They can simply select the cloned report, click 'Publish' and they will be able to review all the information. They can then choose to approve or cancel the report. The details of how to utilize the clone feature in the GRM can be found in Appendix A.

## **4.2 Missing Screens**

The second enhancement completed by the team was to add missing screens for data maintenance and integrate existing screens into the GRM. Currently, users need to manually maintain the data from the back-end if the screen is missing in the GRM. The current workflow is shown below in Figure 7.

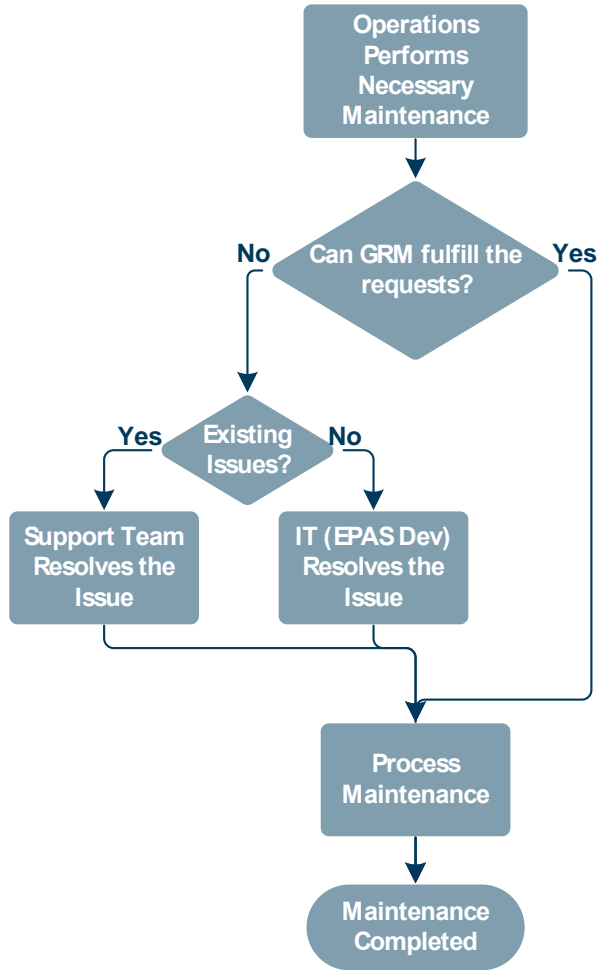


Figure 7: Previous Data Maintenance Workflow

By creating and integrating data maintenance screens into the GRM, the IT team is eliminated from the process, and the users can perform necessary maintenance via screens in the GRM. The workflow is improved as shown in Figure 8.

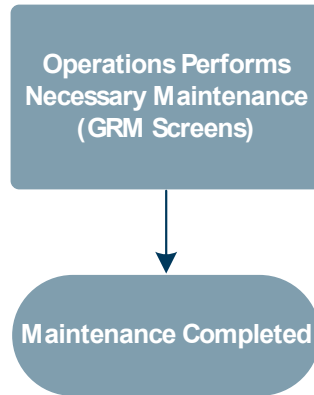


Figure 8: Optimized Data Maintenance Workflow

#### 4.2.1 Mapping Screens

Although we worked primarily on the File Exporter portion of the GRM, we also implemented four mapping screens, which are used to normalize client data to Barclays' data. For example, when Barclays' clients provide their instrument data, Barclays needs to normalize (i.e. map) it to Barclays' records, so the GRM will be able to understand and utilize the data.

The first screen we worked on was the Instrument mapping screen. Previously instrument mapping was done outside the GRM by the user with a screen located elsewhere in the Barclays' intranet. To simplify the process we integrated the screen into the GRM. We were able to create a slightly different version of the previous screen within the GRM. The new screen also includes additional functionality that wasn't a part of the original screen. It displays the instrument mapping records, and allows the user to search for a record based on several criteria. Once they have chosen a record, they are able to map it in a variety of ways. The first option is the copy mapping feature. The copy mappings feature allows a user to search for another record and copy the mapping of that record to be used for the unmapped record. The second option allows the user to map the record manually by entering a value. The other two

options deal with other records that are similar to the one selected. If the record selected has records with similar information in it, they appear in the related records sections. If the related record has the desired mapping, a user can apply the related record's mapping to the selected record above. Besides mapping instrument records, the screen also allows a user to view the multipliers of a mapped record and create or update a multiplier record as needed. The user can view the instrument code records, add a new record, update a current record, or deactivate a record. The steps to perform all these functions can be found in Appendix B.

Unlike instrument mapping, there was no screen anywhere to update account mappings, so we created a new screen for this in the mapping section of the GRM. The screen contains several search criteria the user can employ to find the desired account. The user can then select an account, and click the update button in the toolbar. This will create a popup window within which the user can update select fields associated with the account records. The details of this function can be found in Appendix C.

We also created a new broker mapping screen. Like the account mapping screen, there are several search criteria that can be used to locate the desired record. The user can then use the update button to open a popup window in which they can update the source broker. Steps to update account mappings can be found in Appendix D.

The MIS sector screen is the final mapping screen we designed and implemented. Similar to the account and broker screens, the MIS sector screen allows you to search for a record by several criteria, and then update a subset of the fields displayed in the table. The details of this screen can be found in Appendix E.

### **4.2.2 Reconciliation Account**

The Reconciliation Account screen was added as another means of report configuration in the File Exporter. It allows users to search for accounts associated with a particular client to include in the reconciliation report. Users can also filter accounts by three different types of codes, which are the Registered Rep Code, Group Code 2, and Group Code 5. Both the Registered Rep Code and Group Code 2 are used to define a client, and the Group Code 5 is used to define the client's region under the Group Code 2. Users have three options to manipulate the account parameter in report configuration: 'Include', 'Remove', and 'Remove All.' Through the three function buttons, a user can either include or remove the data associated with the client's accounts. The details of Reconciliation Account and its functionalities can be found in Appendix F.

### **4.2.3 Reconciliation Configuration**

We also added a Reconciliation Configuration window within File Exporter. This window allows the user to configure the reconciliation information associated with the export. The 'Recon Config' button opens a window which displays all of the fields required to create or modify a reconciliation configuration record. The window displays all current reconciliation records associated with the client ID of the export. The user then has two options. One option allows the user to select and edit a previous reconciliation configuration record and the other option allows the user to add a new reconciliation configuration record to the database. The steps to use each of these options are in Appendix K.



If the user chooses to edit an existing reconciliation configuration record, the user would click on one of the records and see the values of every field in the record. Then the user is allowed to make changes to those values. If the user chooses to cancel, the new values are not saved to the database. If the user selects 'Save,' the record is updated with the new information.

If the user chooses to add a reconciliation configuration record, the user would select 'Add.' When the 'Add' button is clicked, the user is able to edit the default values of the new reconciliation configuration record. If the user selects 'Cancel,' the new record is not saved to the database. If the user selects 'Save,' the new record is saved to the database.

### **4.3 Existing Pages**

The last enhancement type the team worked on was to fix broken pages and add functionalities to existing screens in the GRM. IT has to be involved when there are broken and missing functionalities in order to complete client requests. This creates a clunky workflow as shown below in Figure 9.

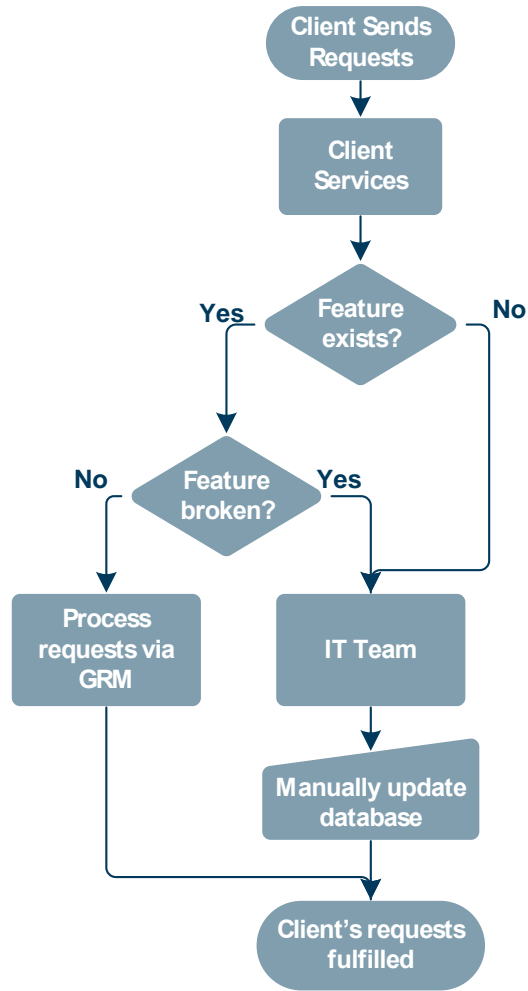


Figure 9: Current Workflow with Broken Features

The team improved the usability of the GRM, so the users can utilize it to fulfill client requests more efficiently. The workflow is optimized as shown in Figure 10.



Figure 10: Optimized Workflow

### 4.3.1 Smart Flow II Account

Smart Flow II (SMF2) is another account parameter screen we improved. The existing SMF2 account screen had a few issues including that a user could only search for a client's accounts, and incorrect account information was added into the EPAS database. We redesigned the SMF2 account screen by adding an exchange filter portion to the screen so that a user is able to filter a client's account by exchange, product, and source. The SMF2 account screen now has an account search and exchange filter on one screen, so the user can access them by simply expanding and collapsing them as needed. In both the account search and exchange filter, we fixed and added the 'Include', 'Exclude', 'Remove', and 'Remove All' options. Therefore, a user can easily manipulate the data associated with the chosen accounts to generate a Smart Flow II report. We also fixed the bugs that wrote incorrect data to the database to ensure the screen was updated with the right information. Previously if the trader for the account being added was not already in the database, an existing trader would be used instead of the trader entered by the user. Details of the SMF2 account screen and its functionalities can be found in Appendix G.

### 4.3.2 Authorization Screens

We improved three authorization screens in the File Exporter. The first authorization screen, SMF2-Fund, did not have any functioning buttons. We enabled the 'Add,' 'Edit,' 'Delete,' and 'Approve' buttons to operate in the same way as the other two existing authorization screens. The 'Add' button allows you to choose a fund and add a record for it. The 'Edit' button allows you to change the fund of unapproved records. If the record has

already been approved, you will only be able to view the information in the Edit window. The 'Delete' button allows the user to delete unapproved records. If the record has already been approved, it cannot be deleted from this screen. Finally, the 'Approve' button allows a user to approve a record. However, a record cannot be approved by the same user who created it. Appendix H contains the details of all the buttons on this screen.

The other two authorization screens, GMI-RR and RANSYS-GC had functional 'Add,' 'Edit,' and 'Approve' buttons. The 'Delete' button in each, however, was not enabled. We repaired these two buttons so that unapproved records can be deleted. They operate identically to the 'Delete' button in the SMF2-Fund authorization screen. The details of how to use these two buttons can be found in Appendices I and J.

### **4.3.3 PDF Report Parameters**

Also within the File Exporter, there is a Reports tab which allows the user to configure the reports of the selected export in the File Exporter screen. In this tab, users can modify the reports by selecting one of the button options on the top bar of the tab. The button we were particularly concerned with was the 'Edit' button. This button allows users to edit several of the reports themselves as well as the parameters that are associated with each report's report ID.

The issue with the edit feature was that it did not have any functionality if the type of report was a PDF. Since many reports are in PDF format, it was necessary to make the edit feature functional so a user can properly edit a PDF report. To do this, we created a popup window to be shown when the 'Edit' button was clicked while selecting a PDF report. We then

added all the necessary features to the window to make it functional. The window displays data from two separate tables in the database and allows users to submit changes to both of them by selecting the 'Save' button. If the user closes the window, the values that were edited will not be saved. After the 'Save' button is clicked, the changes made in the window will be saved to the database and a notification will appear displaying the results of the save. These steps are outlined in Appendix L.

#### **4.3.4 Excel Report Parameters Override**

We improved and modified both the GUI and the back-end database connections in the Excel Report Parameter window. The main issues were that users could not view the parameter changes they made in the parameter editing window, and the parameter changes were saving in the wrong table in the EPAS database. Since different types of parameters are retrieved from different tables, the colors of those parameter values are different; blue for template values and green for default values. We set those parameters, values, and notes to red if a user makes any changes. Also, the notes column now has a short description to notify the user if the value parameter is changed. We also corrected the link to the database so now when a user changes a parameter value the modified value is saved into the correct table. Now when a report contains an Excel type file (.csv or .xls), the user is able to clearly see the edits they made to the parameters in the report through the edit window. The details can be found in Appendix M.

### 4.3.5 Manual Run

In the File Exporter screen, we improved the user experience of manually running reports. The 'Run' button on the File Exporter screen opens a Manual Run window, which allows users to manually run a report. Within the Manual Run window, the user has the option to set email delivery details, such as the destination address and the date and time for delivery.

The main issue with the Manual Run window was that it did not execute or produce a warning message when the required fields were not filled out. Since the user has to select a batch ID and schedule ID in order to perform the manual run action, we set both the batch ID and schedule ID fields as required fields in the Manual Run window. If the user does not select either field, a warning window will be displayed to ask the user to fill out both fields. We also eliminated inactive schedule ID options in the schedule ID drop-down, so that the user will not be distracted by irrelevant information. After all the required fields are filled out, a user is able to run a report of the selected export job by clicking the Export Job button in the Manual Run screen.

### 4.3.6 Auditing

In the current GRM, there is already an audit feature in place. However, the feature is broken because of the way it joins the history table to the other tables in the database that it is referencing. Previously, the audit feature used a join command and used the primary key and the reference table to retrieve the information from the history table to show the changes that were made. However, if the record with the same primary key was deleted in the referenced table, the join command would not return anything so no information would be retrieved even

if the history records were in the history table. Therefore, the audit feature would fail to display the history of a deleted file in a table.

To fix this, we reworked the way the audit feature functioned. Instead of joining the history table to the tables that were being changed, we used the primary key to retrieve the information from the history table directly. This way, the audit feature would be able to show all of the records with the same primary key and reference table even if the record was deleted. Instructions for retrieving audit information are in Appendix N.

## Chapter 5: Recommendations for Future Work

Having completed our work at Barclays, we reflected on the current state of the GRM. Although the usability of the GRM was greatly improved by our project, there is still room for enhancement. Because the GRM was originally intended only to be used by its developers, it was not created to be very user-friendly. We believe making the user interface more consistent would further improve the user experience. In this chapter we recommend two key areas that we think should be addressed in order to accomplish this. In addition, due to time constraints we were not able to fully develop two of the features we created. Therefore, we also included two recommendations to address the areas that need to be expanded.

1. Our first recommendation is to expand on the cloning feature we developed. Our current wizard will allow users to clone some types of reports; however, it does not support cloning every report. It was designed to accommodate the most commonly cloned report, but it would be useful to be able to clone the other types as well. We recommend further developing the wizard to accommodate all types of reports.
2. Secondly, we recommend expanding our auditing system to include all of the functions we implemented. We developed auditing capabilities for several of the screens we created as detailed in section 4.3.6 of this paper. Due to time constraints, however, we did not implement auditing in the other screens we created. We recommend completing this for all the functionality we added, so that change histories can be viewed for every screen.
3. We also recommend cleaning up the appearance of the GRM. There are many screens that display buttons that are disabled and not used on the page. These unused buttons



should be hidden instead of showing as disabled. From an appearance standpoint, it would improve the look of the page when it only shows buttons that have some sort of functionality on each page.

4. Finally we recommend that a future team make the appearance and functionality of the GRM more consistent. Currently, there are multiple types of warning windows that appear in different portions of the screen. Standardizing these warnings would improve the user experience, and reduce the possibility of user error.

## Chapter 6: Conclusion

Upon arrival in Manhattan at the beginning of the project, we were given a list of improvements our sponsor wanted to see implemented in the GRM. The first task presented many challenges as we learned new technology, adjusted to a new project management approach, and collaborated with new people. While we encountered all these normal challenges of starting a new project, we also had the increased challenge of starting with the most technically difficult task. The list of improvements was given to us in order of their importance to our sponsor, so we completed the tasks in that order. This meant, however, that we needed to complete the cloning function first. Due to the completely new functionality, and the need for a multiple page wizard, this task was the most time-consuming and challenging. This made the beginning of the project more difficult, but once it was done we were able to move through the rest of the list much more quickly. Although we got off to a relatively slow start, we were able to finish the list before we left.

In our final weeks at Barclays we took several steps to ensure our work could be put into production after we left. We created user guides for each of the features we implemented that give step-by-step instructions of how to use each feature. In addition, we did several demos for the developers who took over our code when we left. We also walked them through our code and documentation. When we left our sponsor was in the process of getting our code approved by their Quality Assurance team. They hope to put our work into production in January 2016.

By the end of the project we had implemented the new cloning feature, added new screens, and enabled several broken features. These enhancements will benefit Barclays by

enabling them to better serve their clients. When Client Services receives requests from clients for new reports, they can now complete a much greater number of those requests without the involvement of IT. This will streamline the workflow, and enable them to respond to their clients' needs efficiently. It will also reduce the workload on IT, allowing them to focus their attention on other needs. We also created documentation for each enhancement, so that it can be easily used in the future.

This project gave us valuable experience working with an international team on a project with real business value. We were able to successfully utilize the Scrum methodology to develop an efficient, productive team. As a team, we were able to complete all of the sponsor's goals for the project, and provide useful results to benefit the company.

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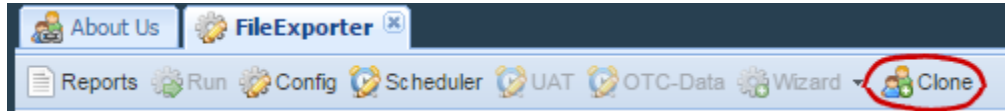
# Appendix A: Cloning Function User Guide

Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to create a clone of an export from one client to another are shown below.

## 0) Initiate the Clone Job

- Go to Job Config & Control -> FileExporter in the GRM
- Select a report to clone
- Click 'Clone'



## 1) Create Clone Job

- Enter Clone export name
- Choose client
  - i. If cloning to an existing client, select the client you want to clone to from the drop-down

Clone to Client:



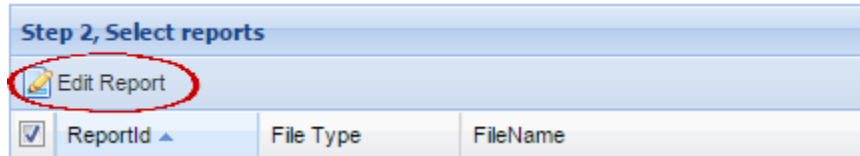
- ii. If cloning to a new client, click 'Add Client' and a pop-up window will appear. Enter information in all four fields, click 'Add', and choose the new client from the drop-down

A screenshot of a pop-up window titled "Add Client". It contains four input fields: "Client Name" with the value "Clone", "Client Description" with "Example Clone Job", "Client ShrtDesc" with "Example", and "Batch ID" with "2015-11-26 00:00". At the bottom, there are two buttons: "Add" and "Cancel".

- Make any desired changes to the other fields
- Click 'Reset' to revert to the original values
- Click 'Next'

## 2) Select Reports

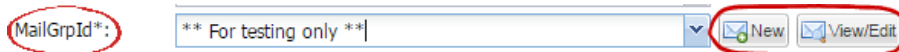
- Select the reports you would like to include
- If you would like to edit any of the reports, select the report, and click 'Edit Report'



- Make any desired changes
  - Click 'Save'
- Click 'Next'

## 3) Email Delivery

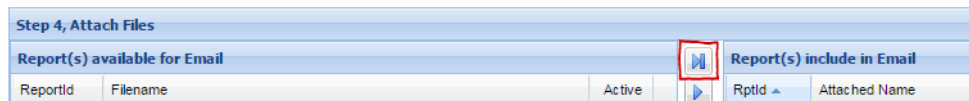
- Enter a subject for the email
- Select an email group
  - If using an existing mail group, choose the group from the drop-down
  - To view, edit, or delete an existing mail group, click 'View/Edit'
  - To create a new mail group, click 'New', enter the name of the new group, click 'Save', and choose the new group from the drop-down



- Make any desired changes to the other fields
- Click 'Next'

## 4) Attach Files

- Click 'Add All' in the center of the page



- Click 'Next'

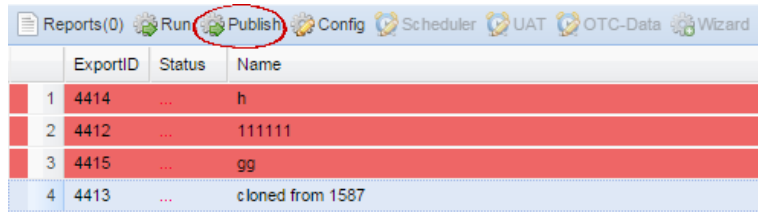
## 5) Review

- Review the information entered in the last four steps
- Change any incorrect information
- To change the client, use the 'Previous' button to return to Step 1
- Click 'Submit'

## 6) Approval

- Go to Maintenance -> Publisher in the GRM
- Select the Export Job

- Click 'Publish'



The screenshot shows a software interface with a menu bar at the top containing the following items: Reports(0), Run, Publish (circled in red), Config, Scheduler, UAT, OTC-Data, and Wizard. Below the menu bar is a table with the following data:

	ExportID	Status	Name
1	4414	...	h
2	4412	...	111111
3	4415	...	gg
4	4413	...	cloned from 1587

- Review the information
- Click 'Approve'

## Appendix B: Instrument Mapping Screen User Guide

### EPAS GRM tasks - Mapping Instrument, External Users

EPAS GRM is used to manage report status, prior runs, reruns, some configuration. Mapping Instrument allows Futures Static Mumbai and Client Services to perform account mapping functions.

Steps below show how to map accounts through “Copy Mapping” button.

- 1) Begin typing SrcId or Client Name or Instrument in the search boxes, and select the mapping status - the search is dynamic, select the client you want to **copy mapping to** (See Below)

ClientName	SrcID	Exch	Instrument	Ccy	Status
**Unknown**	0		FD		

- 2) Results – list of clients meets the search criteria will be displayed in the grid
- 3) Select a row → “Copy Mapping” (pop-up window will display client you want to **copy mapping from**)

SrchID	ClientName	InstCodeId	Instrument	Exch	Ccy	Descr
--------	------------	------------	------------	------	-----	-------



- 4) Type SrcId or Instrument or Source Client to **copy mapping from** - the search is dynamic, select the client you want to **copy mapping from** (Instrument can be changed)

The screenshot shows a search form with the following fields:

- SrcId:** [Empty text box]
- Instrument:** [Text box containing "ES"]
- Source Client:** [Dropdown menu with a redacted selection]
- Search Client:** [Button]

Below the search fields is a **Results** section with a redacted grid.

- 5) Result – source clients are displayed in the grid
- 6) Select a row → “Copy Mapping” button

The screenshot shows the search form with the following fields:

- SrcId:** [Empty text box]
- Instrument:** [Text box containing "ES"]
- Source Client:** [Dropdown menu with a redacted selection]
- Search Client:** [Button]

Below the search fields is a **Results** section with a grid of data:

SrcID	ClientName	InstCodeId	Instrument	Exch	Ccy	Descr
3	[Redacted]	48	[Redacted]	0	USD	[Redacted]
3	[Redacted]	48	[Redacted]	50	USD	[Redacted]
3	[Redacted]	593	[Redacted]	61	EUR	[Redacted]
3	[Redacted]	48	[Redacted]	CME	USD	[Redacted]
3	[Redacted]	593	[Redacted]	EUREX	EUR	[Redacted]
3	[Redacted]	1	[Redacted]	LIFFE	EUR	[Redacted]
3	[Redacted]	1	[Redacted]	LIFFE	EUR	[Redacted]
3	[Redacted]	1	[Redacted]	LIFFE	EUR	[Redacted]

At the bottom right of the interface, there are two buttons: **Copy Mapping** (with a blue arrow pointing to it) and **Cancel** (with a red X icon).

- 7) InstCodeConv Records grid will refresh – copy mapping completed

**Steps below show how to map accounts through “Apply” button.**

- 1) Select a row in InstCodeCove Records grid - possible copy mapping options will shown below grouped by Product and Description
- 2) Select a row in possible mapping options grids, then click Apply button (A pop-up window will appear to confirm the mapping action)

Page 6 of 2638

Displaying

**Possible Mapping Options by Product**

Apply

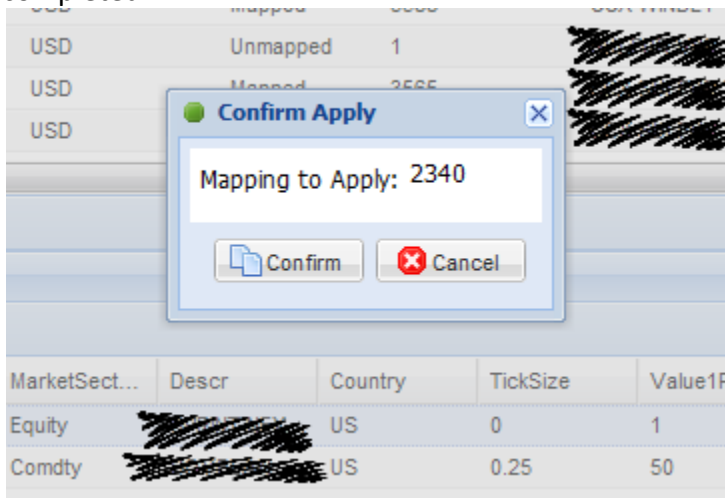
MatchCriteria	InstCodeId	Code	Exch	Ccy	MarketSect...	Descr	Country	TickSize	Value1Pt	ContractSize	SecurityType	LastUpdate
Matched by Inst...	2340	S	CBO	USD	Equity	[REDACTED]	US	0	1	1	Equity	Tue Feb 27...
Matched by Inst...	157	S	CBT	USD	Comdty	[REDACTED]	US	0.25	50	5000	Future	Mon Mar 6 1...

**Possible Mapping Options by Descr**

MatchCriteria	InstCodeId	Code	Exch	Ccy	MarketSect...	Descr	Country	TickSize	Value1Pt	ContractSize	SecurityType	LastUpdate
Matched by Descr	14	BO	CBT	USD	Comdty	[REDACTED]	US	0.01	600	60000	Future	Mon Mar 6 1...
Matched by Descr	157	S	CBT	USD	Comdty	[REDACTED]	US	0.25	50	5000	Future	Mon Mar 6 1...

- 3) Click "Confirm" button, and the InstCodeConv Records grid will refresh, Copy Mapping completed



### Steps below show how to update InstCodeId.

- 1) Begin typing SrclId or Client Name or Instrument in the search boxes, and select the mapping status - the search is dynamic, select the client you want to update InstCodeId
- 2) Results – list of clients meets the search criteria will be displayed in the grid (See Below)

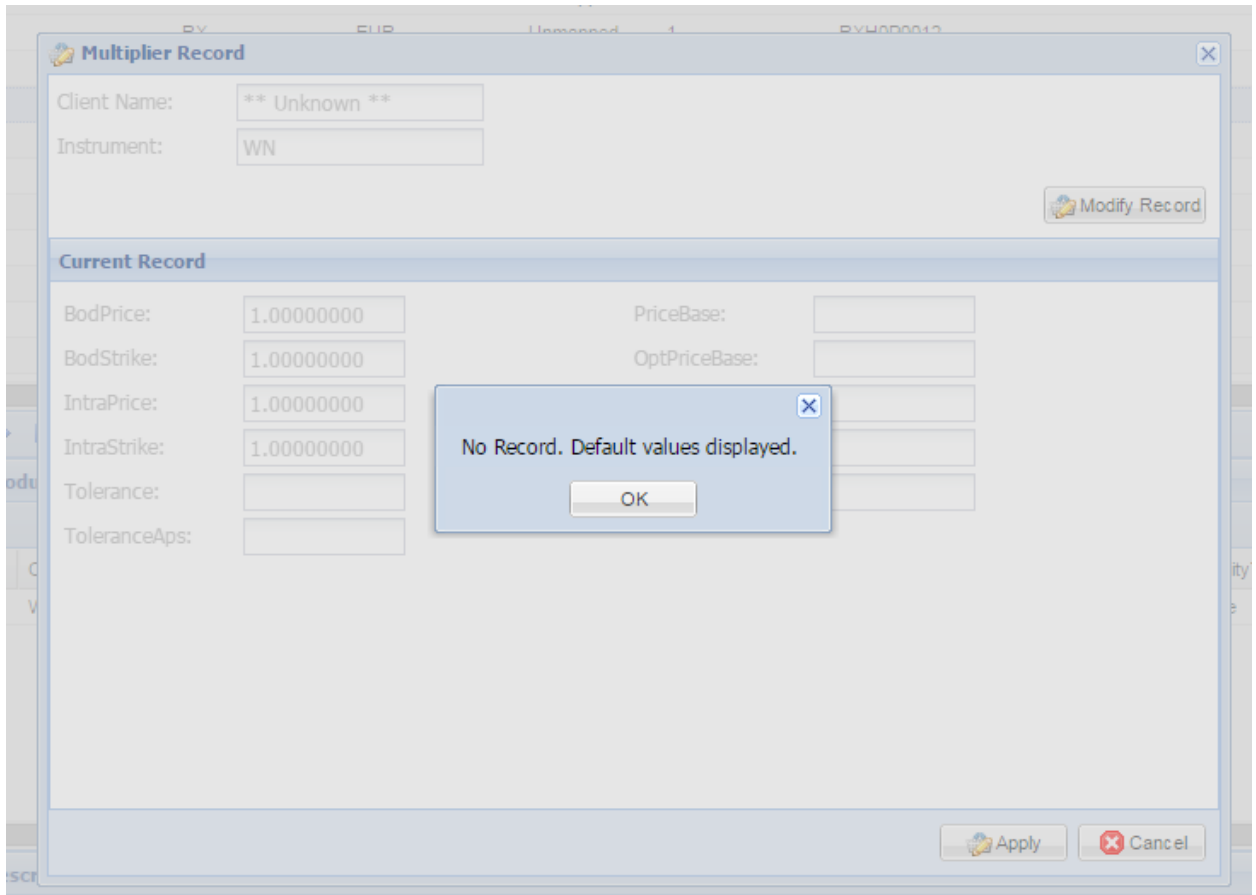
InstCodeConv Records								
SrcID	ClientName	SrcID	Exch	Instrument	Ccy	Status	InstCodeId	Descr
1	[REDACTED]	528	CBT	OCG	USD	Unmapped	1	OCG
2	[REDACTED]	528	CBT	OFV	USD	Unmapped	1	OFV
3	[REDACTED]	528	CBT	OPG	USD	Unmapped	1	OPG
4	[REDACTED]	528	CBT	UBE	USD	Unmapped	1	UBE
5	[REDACTED]	528	CME	ES	USD	Unmapped	1	ES
6	[REDACTED]	528	CME	NQ	USD	Unmapped	1	NQ
7	[REDACTED]	528	CME	OED	USD	Unmapped	1	OED
8	[REDACTED]	528	CME	OPE	USD	Unmapped	1	OPE
9	[REDACTED]	528	EUREX	FBTPS	EUR	Unmapped	1	FBTPS
10	[REDACTED]	528	EUREX	FESB	EUR	Unmapped	1	FESB
11	[REDACTED]	528	EUREX	FEST	EUR	Unmapped	1	FEST
12	[REDACTED]	528	EUREX	FXXP	EUR	Unmapped	1	FXXP
13	[REDACTED]	528	ICE	TF	USD	Unmapped	1	TF
14	[REDACTED]	528	LIFFE	N	JPY	Unmapped	1	N

3) Select a row → "Update" button (pop-up window will display)

4) InstCodeConv Records grid will refresh – update InstCodeId completed

**Steps below show how to add or modify Multiplier Record.**

- 1) Select a row in InstCodeCove Records grid → "Multiplier" button (a pop-up window will appear)
- 2) If there is no multiplier record exists, a alert box will appear (See below)



- 3) All fields will be disabled, click "Modify Record" button to add or modify the multiplier record

**Multiplier Record**

Client Name:

Instrument:

**Current Record**

BodPrice:	<input type="text" value="1.00000000"/>	PriceBase:	<input type="text"/>
BodStrike:	<input type="text" value="1.00000000"/>	OptPriceBase:	<input type="text"/>
IntraPrice:	<input type="text" value="1.00000000"/>	IntraQty:	<input type="text"/>
IntraStrike:	<input type="text" value="1.00000000"/>	BodQty:	<input type="text"/>
Tolerance:	<input type="text"/>	VMTolerance:	<input type="text"/>
ToleranceAps:	<input type="text"/>		

4) Change any field if necessary, click “Apply” to add or modify the multiplier record

**Steps below show how to add InstCode Record.**

- 1) Click “InstCode Record” button to open InstCode Record tab
- 2) Type Exchn or Instrument or Ccy or Descr to search for InstCode records

InstCodeConv    **InstCode Record** ✕

**InstCode Record**

Exch    Instrument    usd    Descr    Search InstCode    Add New

	Ins...	Code	Exch	Ccy	MarketSectorNa...	Descr	Co...	Tic...	Val...	Contr
1	3	AD	CME	USD	Currency	[REDACTED]	US	0.01	1000	10000
2	4	AK	CME	USD	Index	[REDACTED]	US	1	20	20
3	5	AP	CME	USD	Index	[REDACTED]	US	1	20	20
4	9	B6	CME	USD	Index	[REDACTED]	US	1	20	20
5	14	BO	CBT	USD	Comdty	[REDACTED]	US	0.01	600	60000
6	15	BP	CME	USD	Currency	[REDACTED]	US	0.01	625	62500
7	16	BR	CME	USD	Currency	[REDACTED]	US	0.01	1000	10000
8	17	C	CBT	USD	Comdty	[REDACTED]	US	0.25	50	5000
9	18	B4	CME	USD	Index	[REDACTED]	US	1	20	20

- 3) Click "Add New" button to add a InstCode record (a pop-up window will appear)
- 4) Fill out the required fields, and click "Save" to create a record

**Add New InstCode Record** ✕

Code\*:

Ccy\*:

Descr\*:

TickSize\*:

ContractSize\*:

AltSpotOptFC:

OKey:

ExchangeRootSymbol:

BloombergStrikeDecimal:

Exch\*:

MarketSectorName\*:

Country\*:

Value1Pt\*:

SecurityType\*:

FKey:

OptionsCode:

ExchangeMIC:

ExchangeOptionsSymbol:

### Steps below show how to edit InstCode Record.

- 1) Click "InstCode Record" button to open InstCode Record tab
- 2) Type Exchn or Instrument or Ccy or Descr to search for InstCode records

InstCodeConv    **InstCode Record** ✕

**InstCode Record**

Exch    Instrument    usd    Descr    Search InstCode    Add New

	Ins...	Code	Exch	Ccy	MarketSectorNa...	Descr	Co...	Tic...	Val...	Contr
1	3	AD	CME	USD	Currency	[REDACTED]	US	0.01	1000	10000
2	4	AK	CME	USD	Index	[REDACTED]	US	1	20	20
3	5	AP	CME	USD	Index	[REDACTED]	US	1	20	20
4	9	B6	CME	USD	Index	[REDACTED]	US	1	20	20
5	14	BO	CBT	USD	Comdty	[REDACTED]	US	0.01	600	60000
6	15	BP	CME	USD	Currency	[REDACTED]	US	0.01	625	62500
7	16	BR	CME	USD	Currency	[REDACTED]	US	0.01	1000	10000
8	17	C	CBT	USD	Comdty	[REDACTED]	US	0.25	50	5000
9	18	B4	CME	USD	Index	[REDACTED]	US	1	20	20

3) Select a row → click “Update” button to edit the record (a pop-up window will appear)

ME USD Currency [REDACTED] US 0.01 625 62500 Future Mon Mar 6 1...

ME USD Currency [REDACTED] US 0.01 1000 100000 Future Mon Mar 6 1...

BT USD [REDACTED] US 0.05 50 5000 Future Mon Mar 6 1...

ME USD [REDACTED]

YB USD [REDACTED]

ME USD [REDACTED]

F USD [REDACTED]

YF USD [REDACTED]

ME USD [REDACTED]

YM USD [REDACTED]

E USD [REDACTED]

ME USD [REDACTED]

YB USD [REDACTED]

ME USD [REDACTED]

ME USD [REDACTED]

BT USD [REDACTED]

BT USD [REDACTED]

UX USD [REDACTED]

YM USD [REDACTED]

ME USD Currency [REDACTED] US 0.0... 125... 125000 Future Mon Mar 6 1...

ME USD Comdty [REDACTED] US 0.005 2500 1000000 Future Mon Mar 6 1...

**Update InstCode Record** ✕

Code\*:     Exch\*:

Ccy\*:     MarketSectorName\*:

Descr\*:     Country\*:

TickSize\*:     Value1Pt\*:

ContractSize\*:     SecurityType\*:

AltSpotOptFC:

OKey:     FKey:

ExchangeRootSymbol:     OptionsCode:

BloombergStrikeDecimal:     ExchangeMIC:

ExchangeOptionsSymbol:

4) Modify the field → click “Update”, InstCode Record grid will refresh – record is updated

**Steps below show how to deactivate InstCode Record.**

- 1) Click “InstCode Record” button to open InstCode Record tab
- 2) Type Exchn or Instrument or Ccy or Descr to search for InstCode records

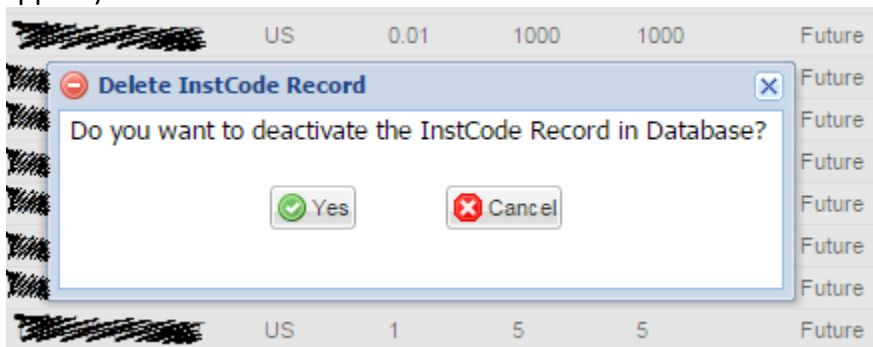
InstCodeConv    **InstCode Record** [X]

**InstCode Record**

Exch    Instrument    usd    Descr    Search InstCode    Add New

	Ins...	Code	Exch	Ccy	MarketSectorNa...	Descr	Co...	Tic...	Val...	Contr
1	3	AD	CME	USD	Curncy	[REDACTED]	US	0.01	1000	10000
2	4	AK	CME	USD	Index	[REDACTED]	US	1	20	20
3	5	AP	CME	USD	Index	[REDACTED]	US	1	20	20
4	9	B6	CME	USD	Index	[REDACTED]	US	1	20	20
5	14	BO	CBT	USD	Comdty	[REDACTED]	US	0.01	600	60000
6	15	BP	CME	USD	Curncy	[REDACTED]	US	0.01	625	62500
7	16	BR	CME	USD	Curncy	[REDACTED]	US	0.01	1000	10000
8	17	C	CBT	USD	Comdty	[REDACTED]	US	0.25	50	5000
9	18	B4	CME	USD	Index	[REDACTED]	US	1	20	20
10	20	CC	CME	USD	Comdty	[REDACTED]	US	1	10	10

- 3) Select a row → click “Deactivate” button to edit the record (a pop-up window will appear)



- 4) Result – Click “Yes” to confirm, InstCode Record grid will refresh, deactivate action completed



## Appendix C: Account Mapping Screen User Guide

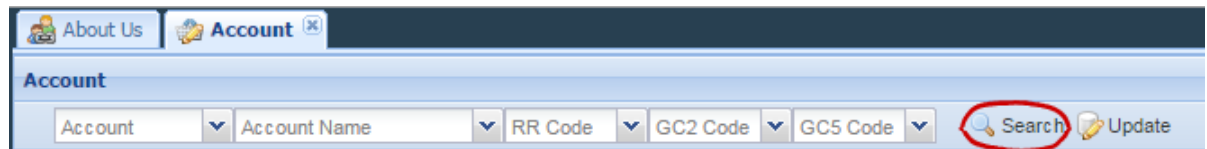
Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to update an account mapping are shown below.

0) Go to Mapping -> Account in the GRM

1) Search for an Account

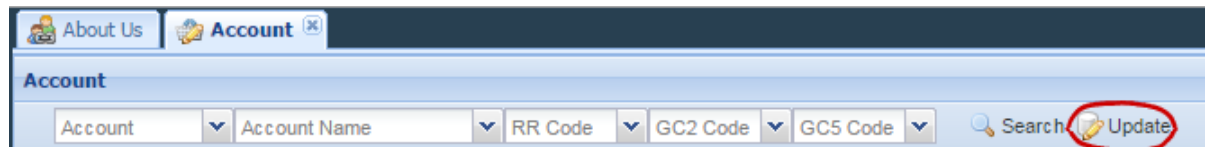
- Choose an Account, Account Name, RR Code, or GC2 Code and GC5 Code from the drop-downs in the search bar
  - i. Note: To search by the GC2 Code and GC5 Code, both codes must be entered
- Click 'Search'



The screenshot shows the 'Account' mapping interface. At the top, there are tabs for 'About Us' and 'Account'. Below the tabs, the title 'Account' is displayed. The search bar contains five dropdown menus: 'Account', 'Account Name', 'RR Code', 'GC2 Code', and 'GC5 Code'. To the right of these dropdowns are two buttons: 'Search' (with a magnifying glass icon) and 'Update' (with a pencil icon). The 'Search' button is circled in red.

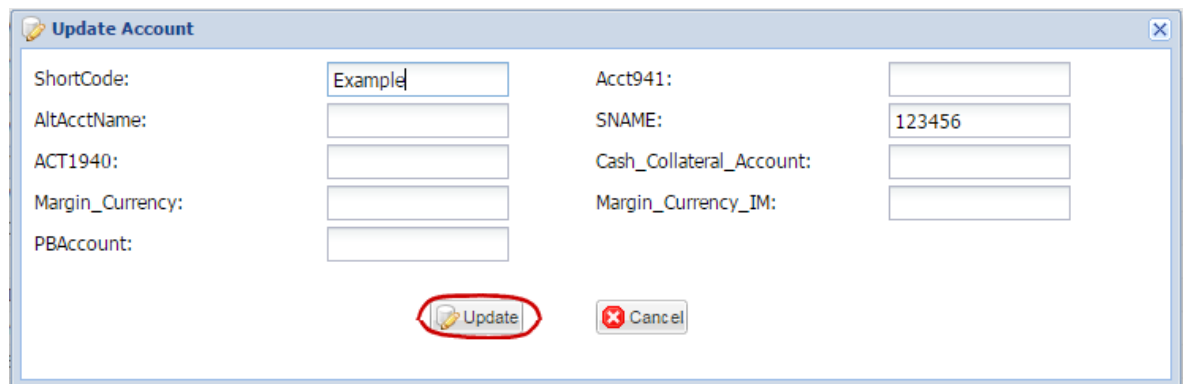
2) Update the Account

- Select an Account
- Click 'Update', and a pop-up window will appear



This screenshot is identical to the previous one, but the 'Update' button (with a pencil icon) is circled in red.

- Enter the information you would like to update
- Click 'Update'



The screenshot shows a pop-up window titled 'Update Account'. It contains several input fields for updating account information:

ShortCode:	<input type="text" value="Example"/>	Acct941:	<input type="text"/>
AltAcctName:	<input type="text"/>	SNAME:	<input type="text" value="123456"/>
ACT1940:	<input type="text"/>	Cash_Collateral_Account:	<input type="text"/>
Margin_Currency:	<input type="text"/>	Margin_Currency_IM:	<input type="text"/>
PBAccount:	<input type="text"/>		

At the bottom of the window, there are two buttons: 'Update' (with a pencil icon) and 'Cancel' (with a red X icon). The 'Update' button is circled in red.

## Appendix D: Broker Mapping Screen User Guide

Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to update a broker mapping are shown below.

0) Go to Mapping -> Broker in the GRM

1) Search for a record

- Choose a Client Name or Broker from the drop-downs, or enter an Exchange
  - i. Note: By default only unmapped records are shown. If you would like to see both unmapped and mapped records, choose 'All' from the 'Mapping Status' drop-down
- Click 'Search'



The screenshot shows the 'Broker' mapping screen. At the top, there are search filters: 'Client Name', 'Broker Code', 'Exchange', and 'Mapping Status', each with a dropdown arrow. To the right of these filters is a 'Search' button with a magnifying glass icon and an 'Update' button with a refresh icon. Below the filters is a table with the following columns: 'SrcID', 'Client Name', 'Broker Code', 'Exchange', 'Status', 'Broker', and 'Broker Description'. The 'Search' button is circled in red.

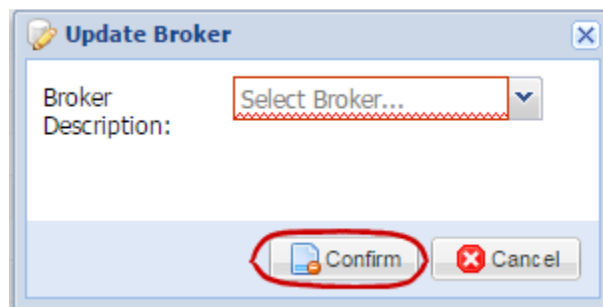
2) Update the record

- Select a row
- Click 'Update', and a popup will appear



This screenshot is similar to the previous one, but the 'Update' button is circled in red. The search filters are populated with values: 'Client Name' is set to '\*\*Test\*\* Data Rdy', 'Broker Code' has a dropdown arrow, 'Exchange' has a dropdown arrow, and 'Mapping Status' has a dropdown arrow. The 'Search' button is also visible.

- Choose the Broker Description from the drop-down
- Click 'Confirm'



The screenshot shows a popup dialog titled 'Update Broker'. It has a close button (X) in the top right corner. The dialog contains a label 'Broker Description:' followed by a dropdown menu with the text 'Select Broker...'. At the bottom of the dialog, there are two buttons: 'Confirm' and 'Cancel'. The 'Confirm' button is circled in red.

# Appendix E: MIS Sector Mapping Screen User Guide

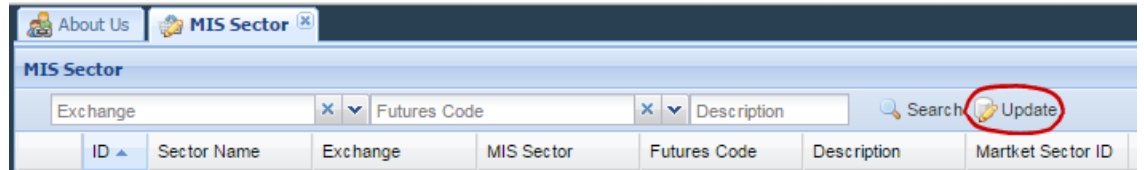
Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to update an MIS Sector record are shown below.

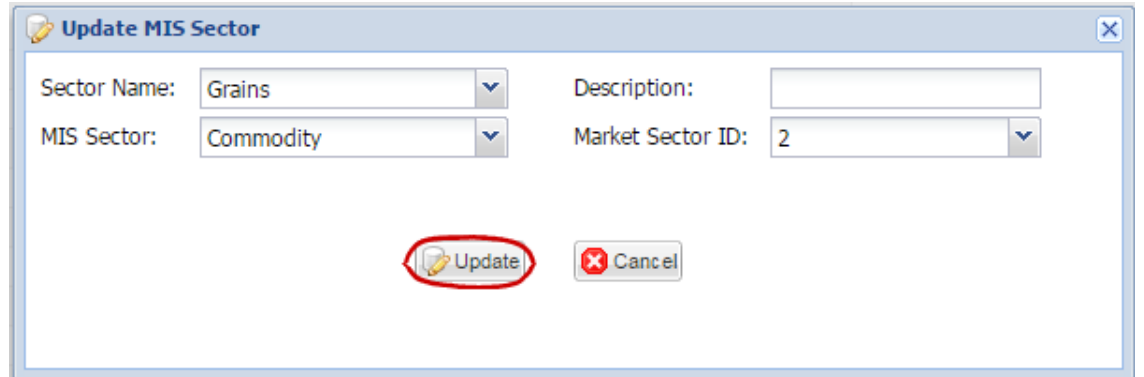
- 0) Go to Mapping -> MIS Sector in the GRM
- 1) Search for a record
  - Choose an Exchange or Futures Code from the drop-downs, or enter a Description
  - Click 'Search'



- 2) Update the record
  - Select a row
  - Click 'Update', and a popup will appear



- Change the Sector Name, MIS Sector, Description, or Market Sector ID
- Click 'Update'



## Appendix F: Reconciliation Account User Guide

Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to add accounts to reconciliation are shown below.

0) Go to Job Config & Control -> FileExporter in the GRM

1) Navigate to the Export's Reconciliation Tab

- Select an export
- Click 'Config'
- Click 'Recon Related' tab

2) Search for Accounts

- Enter an Account Name, or choose a RR Code, GC5 Code, or GC2 Code from the drop-downs
  - i. Note: Some exports do not contain GC5 Codes or GC2 Codes in which case these drop-downs will be empty
- Click 'Go'



The screenshot shows a search form with four input fields and a 'Go' button. The 'Go' button is circled in red. The fields are:

- Account: Account Search...
- RR Code: Select RR...
- GC5 Code: Select GC5...
- GC2 Code: Select GC2...

3) Add Accounts to Reconciliation

- Select reports in the 'Accounts' column that should be included in the reconciliation
- Click 'Include' and the selected reports will be moved to the 'Accounts in Reconciliation' column
- Accounts can be removed from the 'Accounts in Reconciliation' column with 'Remove' or 'Remove All'
- Click 'Save', and a popup window will appear confirming the action was completed successfully

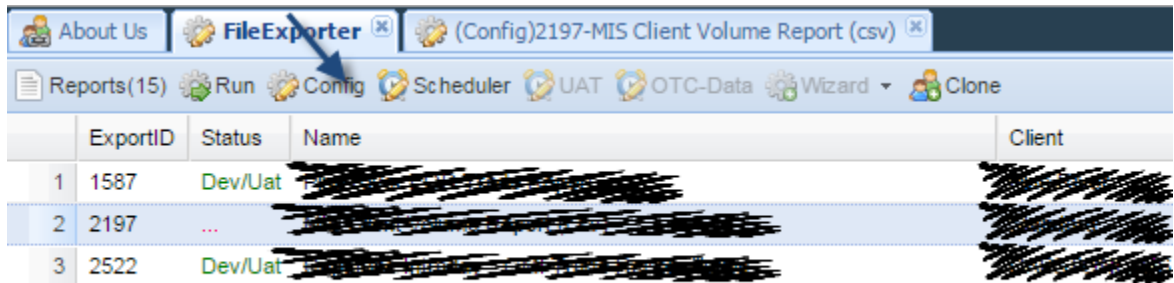
## Appendix G: Smart Flow II Filter User Guide

### EPAS GRM tasks – Smart Flow II Account Rules, External Users

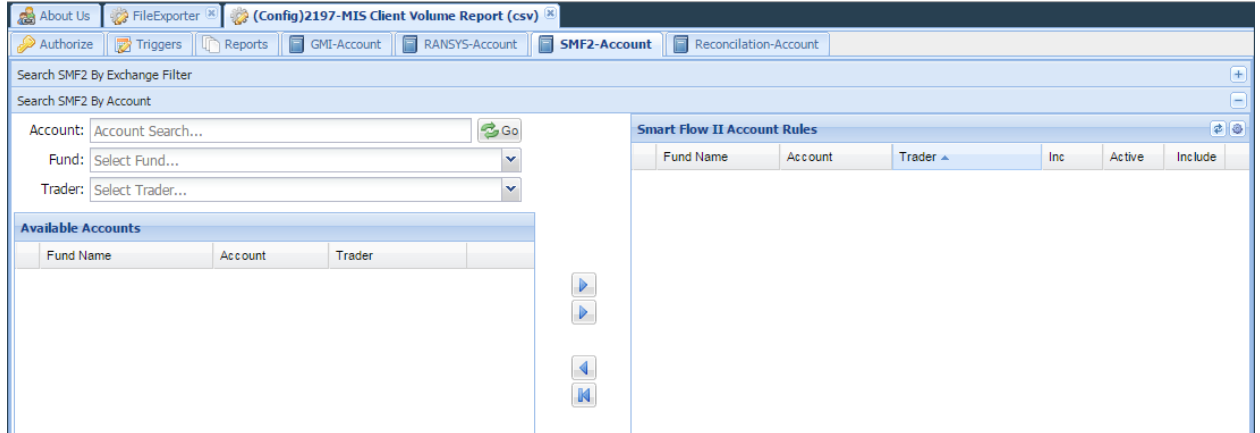
EPAS GRM is used to manage report status, prior runs, reruns, some configuration. Smart Flow II Account Rules allows user to manage SMF2 account rules via either Account search or Exchange filter.

#### Steps below show how to manage SMF2 via Account search Screen.

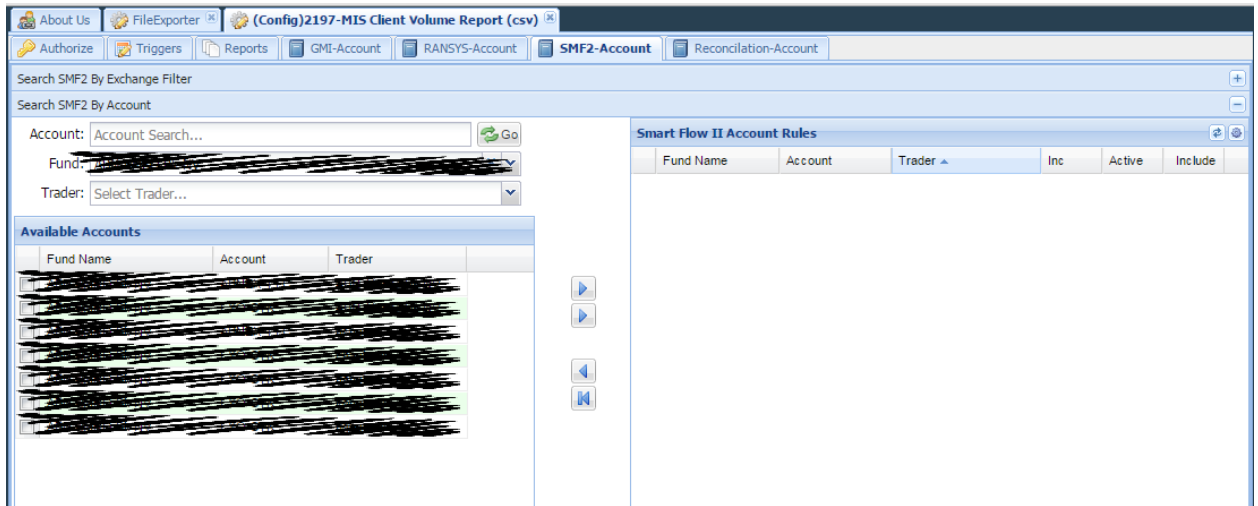
- 1) Select an export job in File Exporter→click “Config” button, the configuration tab of the selected export job will open. (See below)



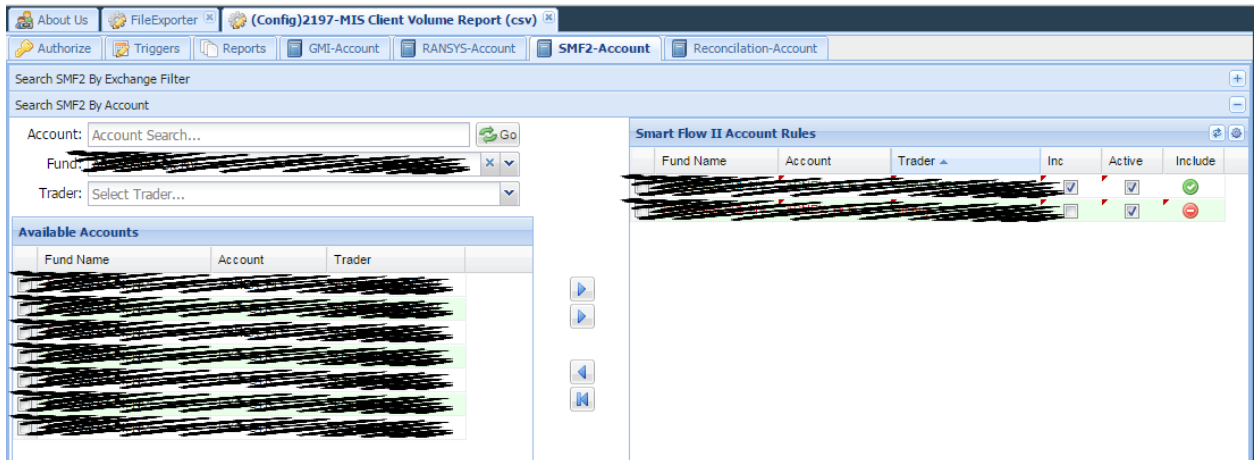
- 2) Select “SMF2-Account” tab (Account Search Screen is loaded by default)



- 3) Use the Account Search field to search for accounts. Select Fund and Trader filter if necessary (Trader filter can only be selected if a Fund is selected)



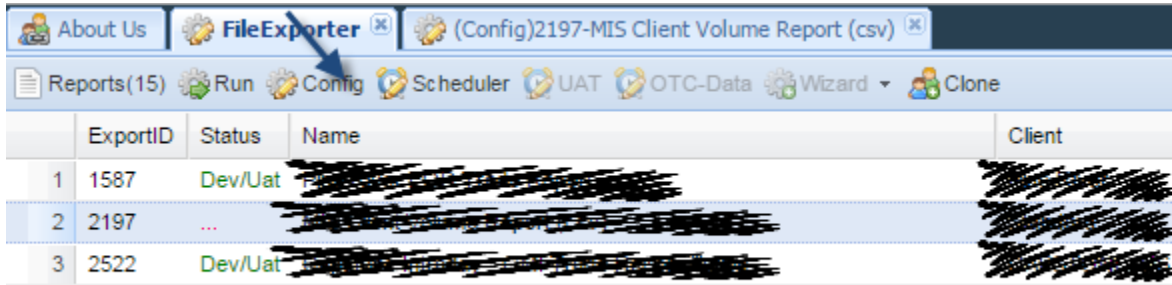
- 4) Use buttons to Include or Exclude available accounts to the Smart Flow II Account Rules grid.



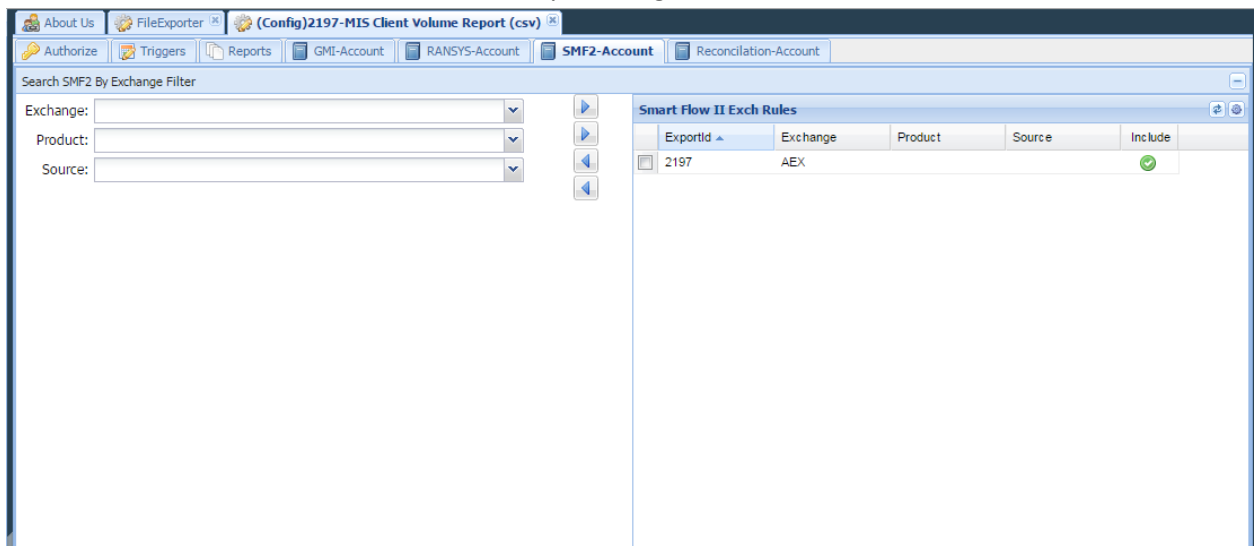
- 5) Use buttons to Remove or Remove entries in All Smart Flow II Account Rules grid.
- 6) Use buttons in the bottom to Preview, Save or Cancel the changes made in Smart Flow II Account Rules.

**Steps below show how to manage SMF2 via Exchange Filter Screen.**

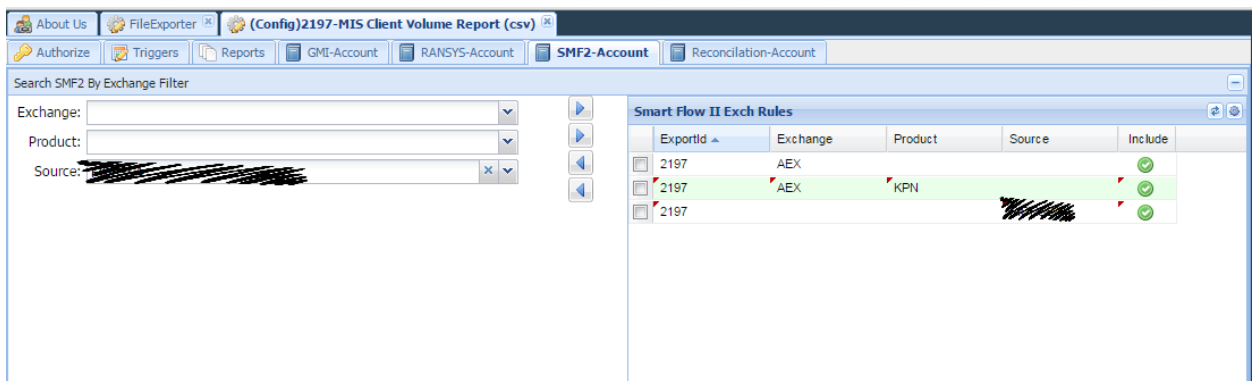
- 1) Select an export job in File Exporter → click “Config” button, the configuration tab of the selected export job will open. (See below)



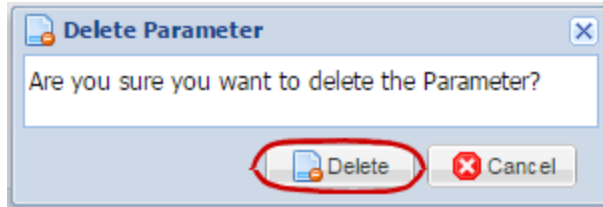
- 2) Select “SMF2-Account” tab → “Search SMF2 By Exchange Filter” tab



- 3) Select Exchange, Product or Source filters to include or exclude in the Smart Flow II Exch Rules grid. (Product filter can only be selected if an Exchange is selected)



- 4) Use buttons to Remove or Remove All entries in Smart Flow II Exch Rules grid.
- 5) Use buttons in the bottom to Preview, Save or Cancel the changes made in Smart Flow II Exch Rules.





## Appendix H: Smart Flow II Authorization Screen User Guide

Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to Add, Edit, Delete, and Approve SMF2-Funds are shown below.

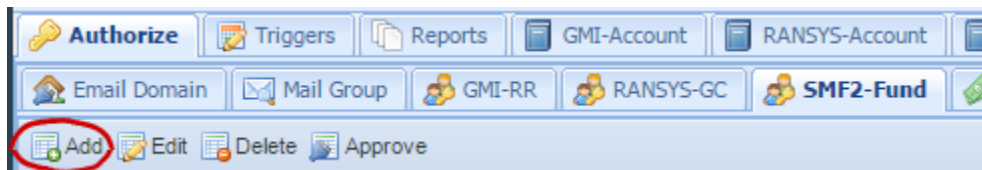
0) Go to Job Config & Control -> FileExporter in the GRM

1) Navigate to the export's SMF2-Fund tab

- Select an export
- Click 'Config'
- Click the 'Authorize' tab
- Click the 'SMF2-Fund' tab

2) To add a new row

- Click 'Add'



- Choose a fund from the drop-down
- Click 'Save'

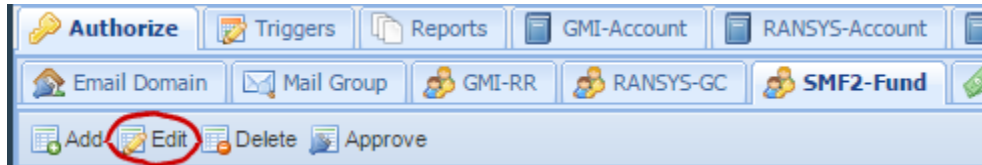
A screenshot of a 'New' dialog box with a light blue border and a close button (X) in the top right corner. The dialog contains several fields: 'Id:' with the value '0', 'Client Id:' with the value '529', and 'Name:' with the value 'Standard'. Below these is a 'Fund:' field with a dropdown menu showing 'Select Fund...' and a 'New' button with a person icon. Further down are fields for 'Created By:', 'Created Date:', 'Approved By:', and 'Approved Date:', all with the value 'N/A'. At the bottom is an 'Active:' checkbox which is checked. At the bottom right of the dialog are two buttons: 'Save' (with a floppy disk icon) and 'Cancel' (with a red X icon). Both buttons are circled in red.

3) To edit an existing row

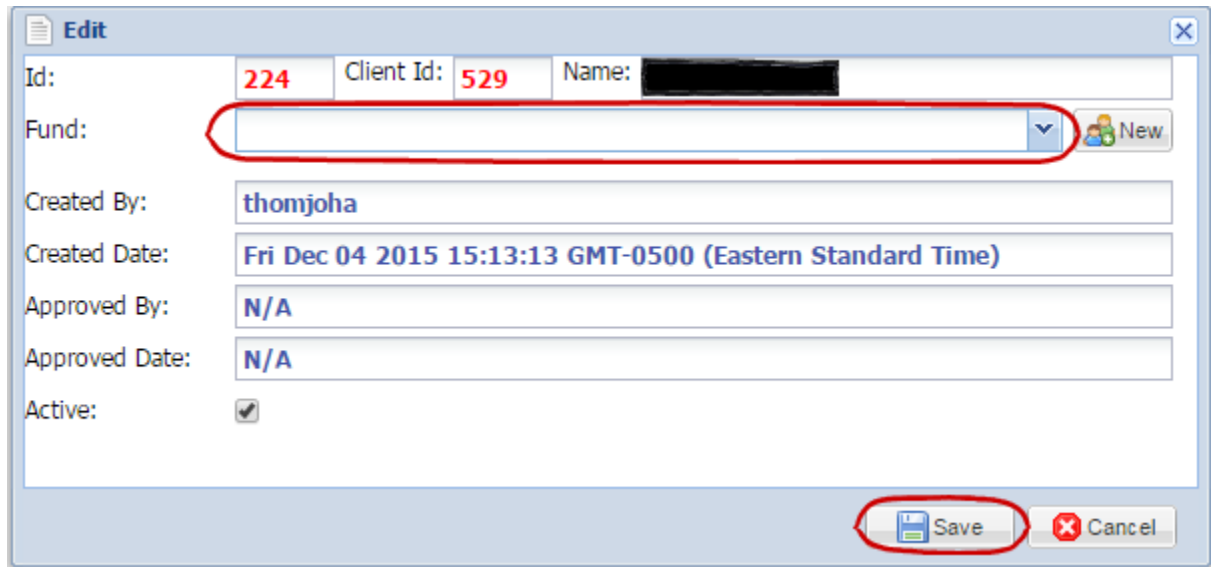
- Select a row

- i. Note: Any row can be selected and the information in the Edit popup window can be viewed, however, the information can only be edited if it is an unapproved row

- Click 'Edit'

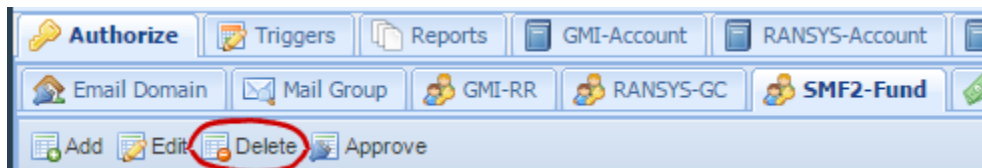


- Make desired changes to the Fund
- Click 'Save'

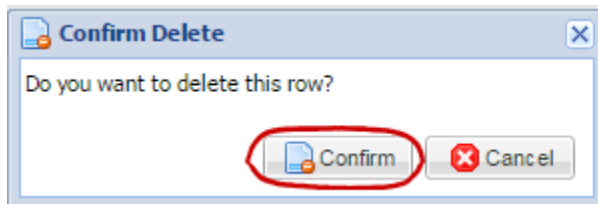


4) To delete a row

- Select an unapproved row
  - i. Note: Approved rows cannot be deleted from this screen
- Click 'Delete', and a popup window will appear



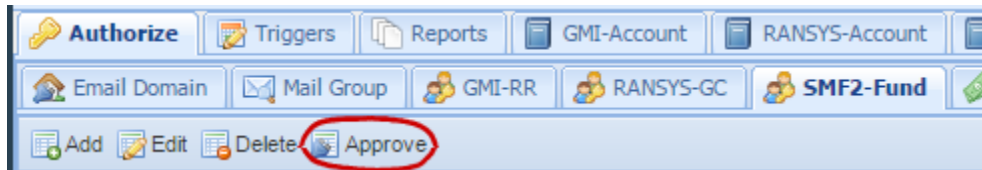
- Click 'Confirm'



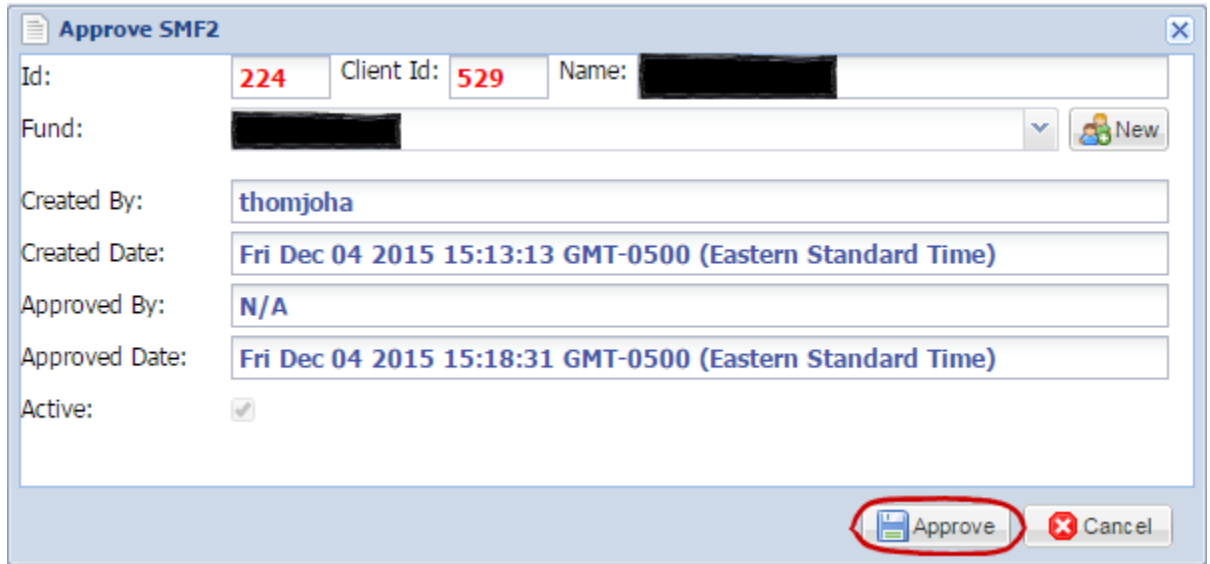
5) To approve a row

- Select an unapproved row

- Click 'Approve', and a popup window will appear



- Click 'Approve'

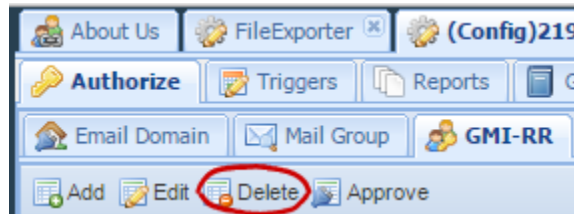


## Appendix I: RR Authorization Screen User Guide

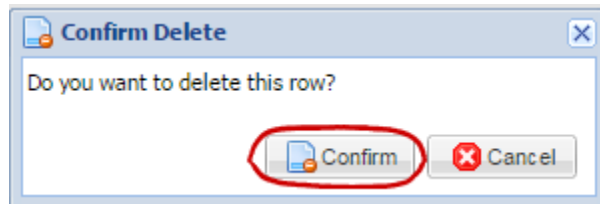
Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to Delete GMI-RR Codes are shown below.

- 0) Go to Job Config & Control -> FileExporter in the GRM
- 1) Navigate to the export's GMI-RR tab
  - Select an export
  - Click 'Config'
  - Click the 'Authorize' tab
  - Click the 'GMI-RR' tab
- 2) To delete a row
  - Select an unapproved row
    - i. Note: Approved rows cannot be deleted from this screen
  - Click 'Delete', and a popup window will appear



- Click 'Confirm'

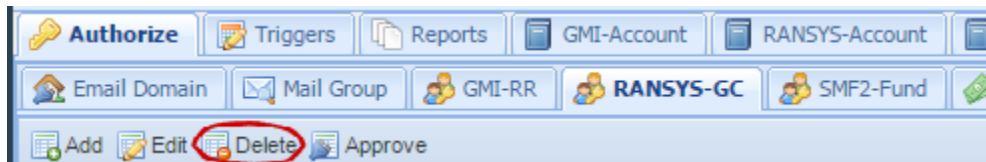


## Appendix J: GC Authorization Screen User Guide

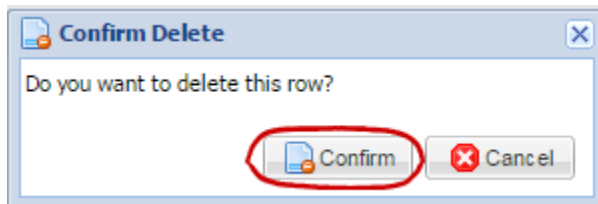
Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to Add, Edit, Delete, and Approve RANSYS-GC Codes are shown below.

- 0) Go to Job Config & Control -> FileExporter in the GRM
- 1) Navigate to the export's RANSYS-GC tab
  - Select an export
  - Click 'Config'
  - Click the 'Authorize' tab
  - Click the 'RANSYS-GC' tab
- 2) To delete a row
  - Select an unapproved row
    - i. Note: Approved rows cannot be deleted from this screen
  - Click 'Delete', and a popup window will appear



- Click 'Confirm'



## Appendix K: Reconciliation Configuration Screen User Guide

Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to Reconciliation Configuration are shown below.

- 0) Go to Job Config & Control -> FileExporter -> Config -> Reports in the GRM
- 1) Click on the Recon Config button
- 2) Select either an existing Recon Config record or click add to create a new record

Recon Config Record							
	Rec Type	Intraday	INTFCMSrcId	INTEXESrcId	Daily	DAYFCMSrcId	DAYEXESrcId
<input checked="" type="checkbox"/>	TRADE	true	0	0	true	1	0
<input type="checkbox"/>	2 TRADE	true	210	765	true	0	0
<input type="checkbox"/>	3 TRADE	true	197	765	true	0	0

- 3) After selecting either option in step 2, the above fields will unlock and the fields of the Recon Config record will be able to be updated.
  - If an existing record was selected, the values of the fields of the selected existing record will be populated into the matching field
  - If the add option was selected, the grid with existing records will be disabled and the default values of a new record will be populated into the fields

**Recon Config**

ClientId: 860 Portfolio: 864

RecType: TRADE FundId: 0

TBLSET: 0 ApsBkrTblset: 0

FilterByVwAcct:  BkrDetail:

Expy:  ReconBlpKey:

Web:  ApsBkrAsOf:

No Activity:

---

**Intraday** Daily

INTFCM Client: 210 - BARX RANSYS In INTEXESrcId: 765

IntFinalAps:  IntEXEAllBatch:

IntReconComm:  IntReconBkr:

IntFCMAs:  IntReconBlpKey:

---

**Recon Config Record**

RecType	Intraday	INTFCMSrcId	INTEXESrcId	Daily	DAYFCMSrcId	DAYEXESrcId
1	TRADE	true	0	0	true	1
2	TRADE	true	210	765	true	0
3	TRADE	true	197	765	true	0

Add Save Cancel

Existing record

**Recon Config**

ClientId: 860 Portfolio:

RecType: FundId:

TBLSET: ApsBkrTblset:

FilterByVwAcct:  BkrDetail:

Expy:  ReconBlpKey:

Web:  ApsBkrAsOf:

No Activity:

---

**Intraday** Daily

INTFCM Client: INTEXESrcId:

IntFinalAps:  IntEXEAllBatch:

IntReconComm:  IntReconBkr:

IntFCMAs:  IntReconBlpKey:

---

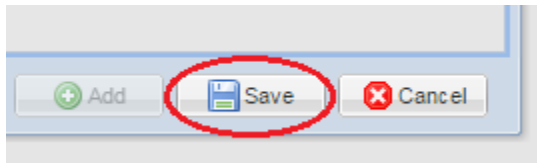
**Recon Config Record**

RecType	Intraday	INTFCMSrcId	INTEXESrcId	Daily	DAYFCMSrcId	DAYEXESrcId
1	TRADE	true	0	0	true	1
2	TRADE	true	210	765	true	0
3	TRADE	true	197	765	true	0

Add Save Cancel

Add record

4) Click save to enter the new values into the database



\*If the cancel button is clicked at any time, all changes made in the window will not be saved\*

## Appendix L: PDF Report Parameters User Guide

Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to Add, Edit, and Delete PDF report parameters are shown below.

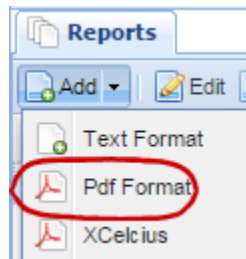
0) Go to Job Config & Control -> FileExporter in the GRM

1) Navigate to the Export's Reports Tab

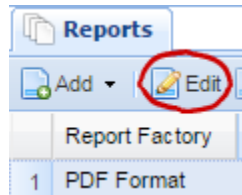
- Select an export
- Click 'Config'
- Click 'Reports' tab

2) Choose a report

- To modify the parameters of a new report, click 'Add' -> 'PDF Format'



- To modify the parameters of an existing report, select a report, and click 'Edit'



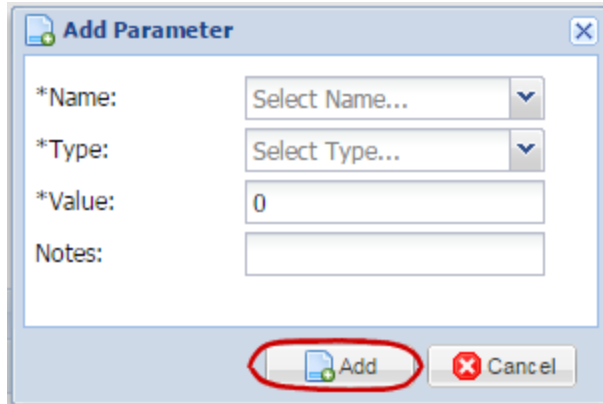
3) Add a parameter

- Click 'Add'



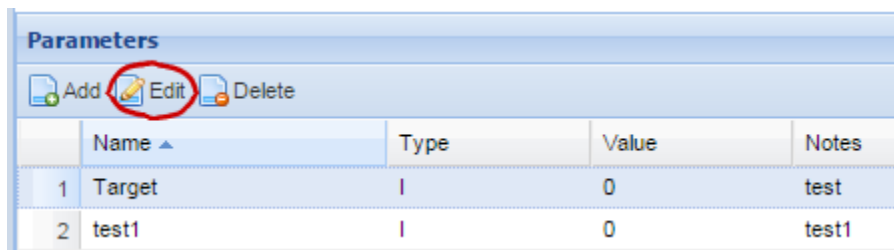
- Enter the Name, Type, and Value
  - i. Note: Notes can be added as well, but are not required
- Click 'Add' and a popup window will appear confirming the parameter was added



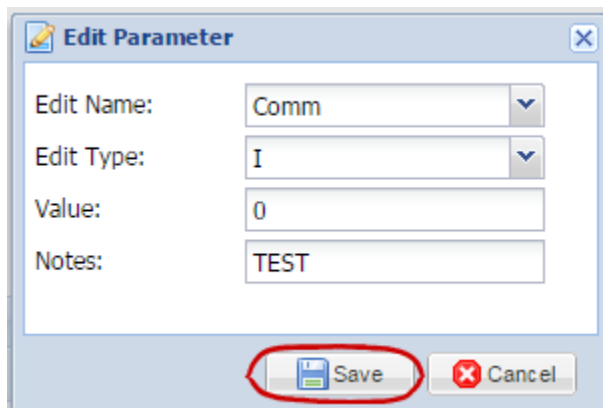


#### 4) Edit a parameter

- Select a parameter
- Click 'Edit'



- Make desired changes to Name, Type, Value, or Notes
- Click 'Save' and a popup window will appear confirming the changes were saved



#### 5) Delete a parameter

- Select a parameter
- Click 'Delete', and a popup window will appear confirming you want to delete the parameter

Parameters				
Add Edit Delete				
	Name ▲	Type	Value	Notes
1	Comm	I	0	test1
2	test	I	0	test

- Click 'Delete' and the parameter will be deleted

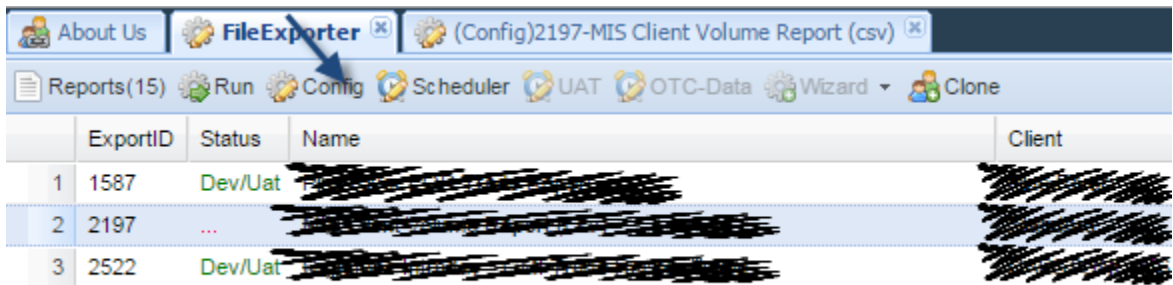
## Appendix M: Excel Report Parameters Override User Guide

### EPAS GRM tasks – File Exporter Excel Report Parameter Edit Override, External Users

EPAS GRM is used to manage report status, prior runs, reruns, some configuration. Excel Report Parameter Edit Override allows user to see the changes made in the excel report parameter grid.

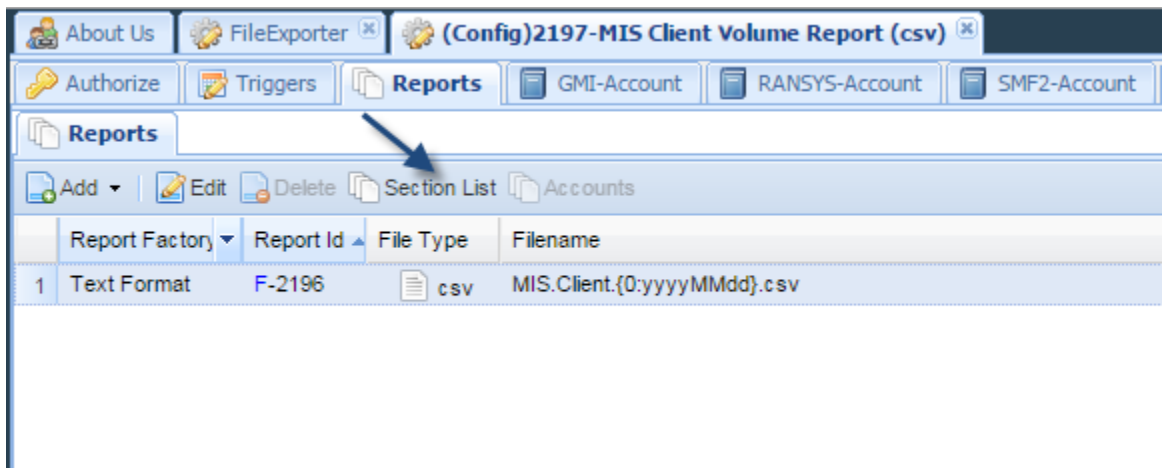
#### Steps below show how to edit excel report parameters.

- 7) Select an export job in File Exporter → click “Config” button, the configuration tab of the selected export job will open. (See below)



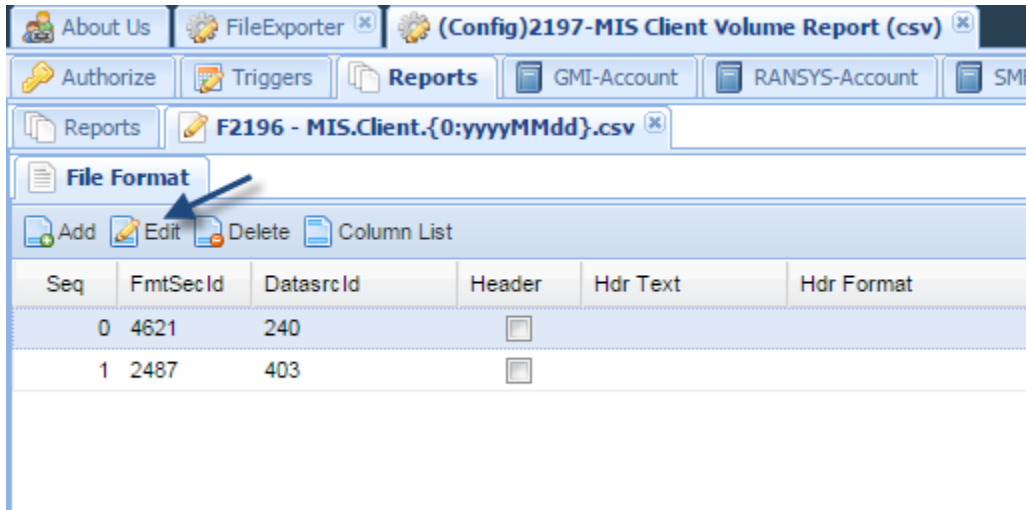
	ExportID	Status	Name	Client
1	1587	Dev/Uat	[REDACTED]	[REDACTED]
2	2197	...	[REDACTED]	[REDACTED]
3	2522	Dev/Uat	[REDACTED]	[REDACTED]

- 8) Select “Reports” tab in the configuration screen, select an excel report file you want to edit → click “Section List” to edit the file format.

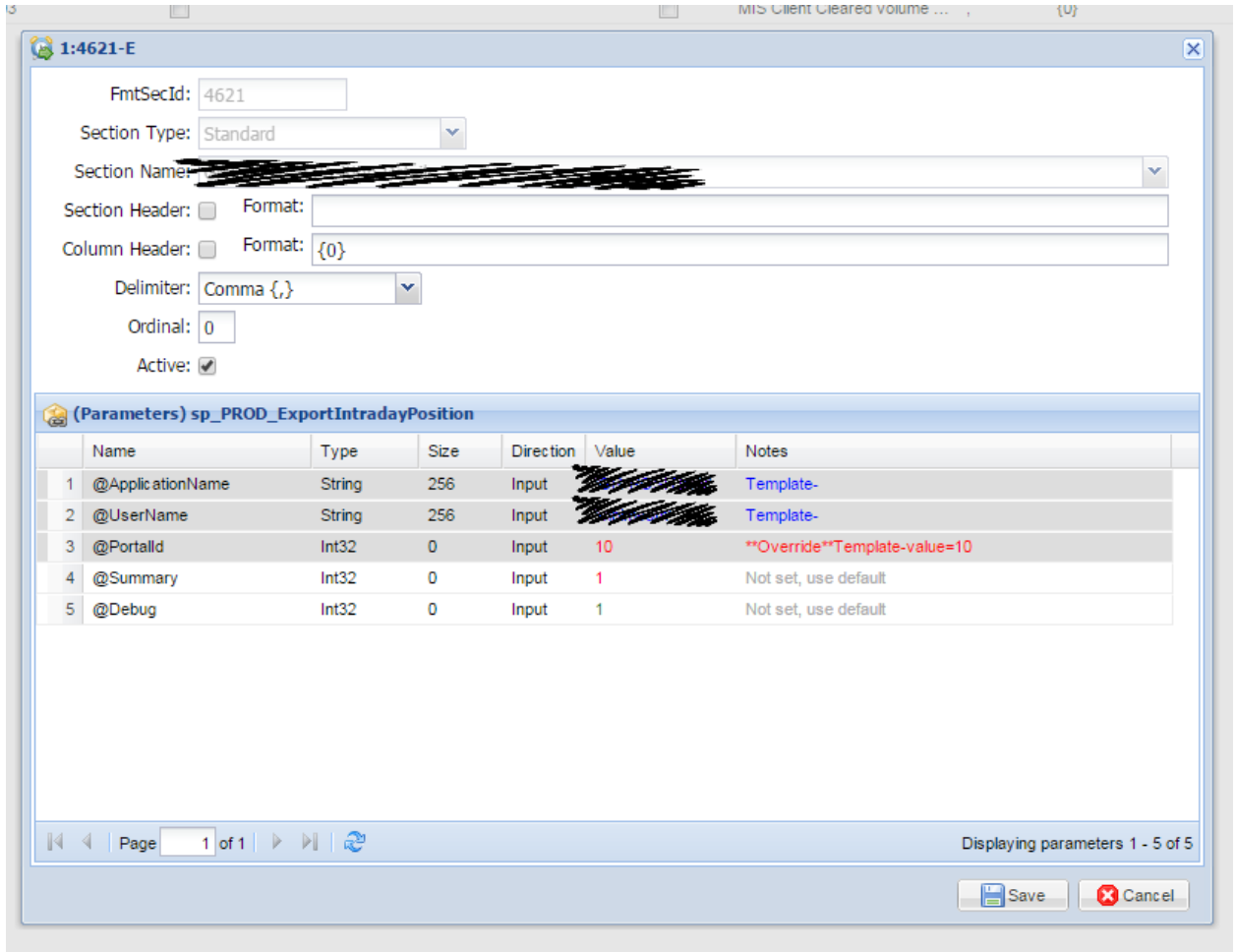


	Report Factory	Report Id	File Type	Filename
1	Text Format	F-2196	csv	MIS.Client.{0:yyyyMMdd}.csv

- 9) Select a section → click “Edit” button to edit the parameters in the section (a pop-up window will open, and parameters are listed)



- 10) Double click the “Value” you want to change → click “Save” button to save the changes.

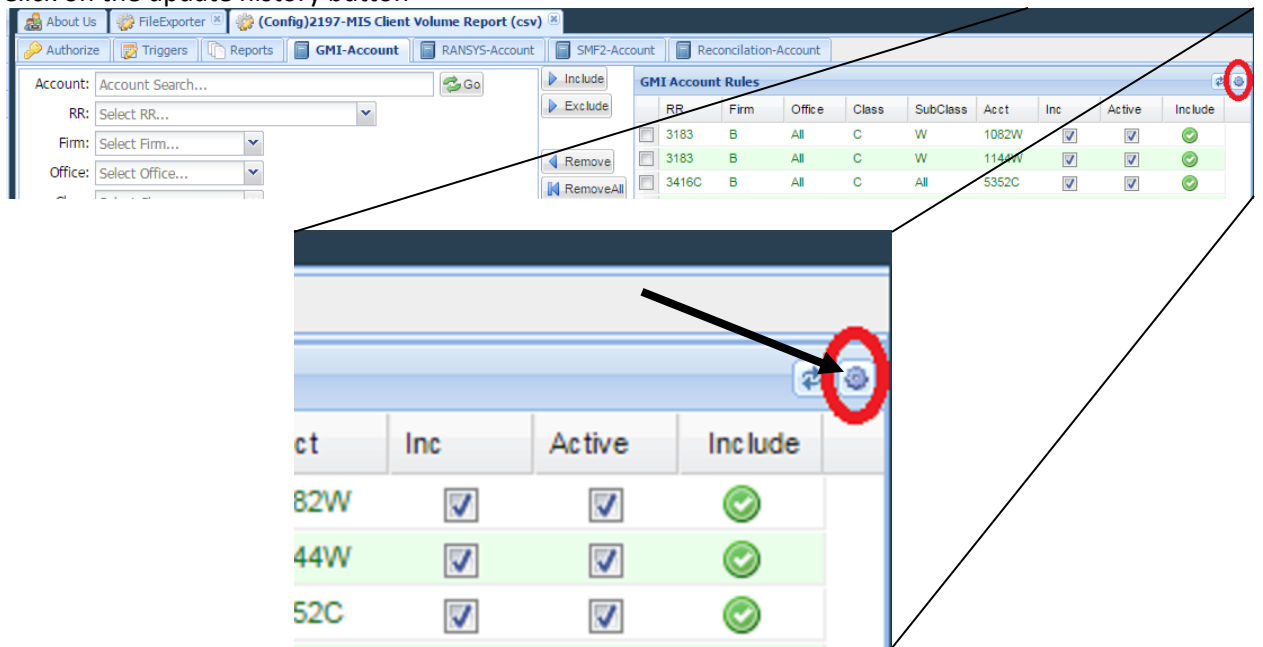


## Appendix N: Auditing User Guide

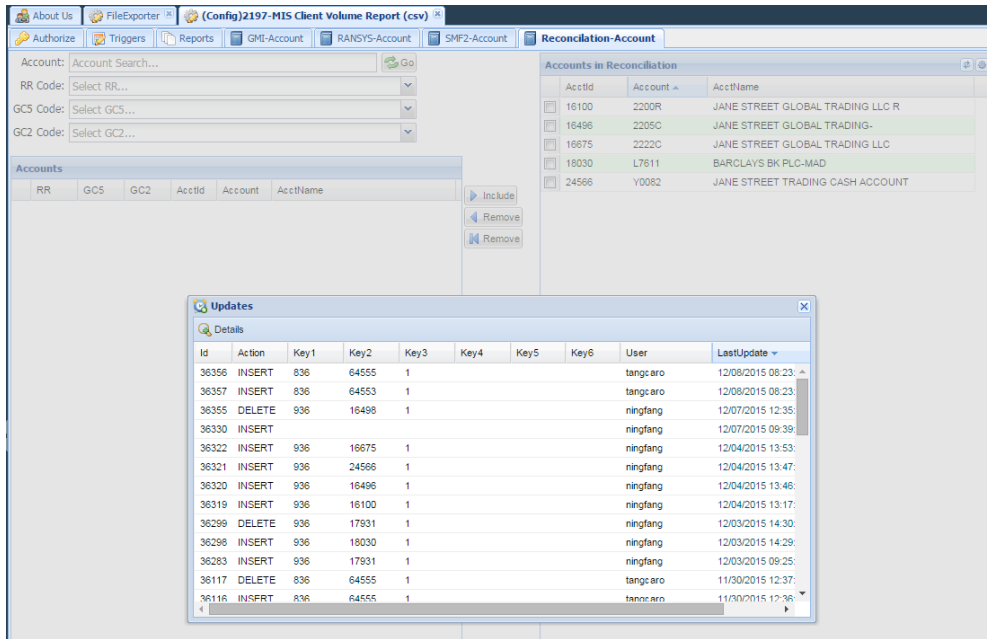
Shortcut to GRM [http://my.barcapint.com/BC/barcaplive?menuCode=PS\\_IN\\_FU\\_GRM](http://my.barcapint.com/BC/barcaplive?menuCode=PS_IN_FU_GRM)

Steps to the Audit feature are shown below.

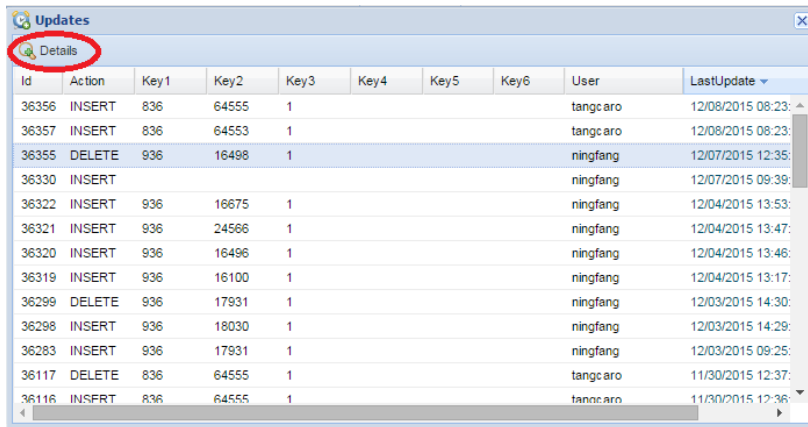
- 0) Go to Job Config & Control -> FileExporter -> Config -> either the GMI-Account or RANSYS-Account or SMF2-Account or Reconciliation-Account tabs
- 1) Click on the update history button



- 2) Then the update window will appear with a history of the changes.



3) You can then get the details of a history record by selecting a record and selecting the details button.



4) The changes window will appear with the details of the change made.

