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Integrations with Rego Data Processor and Extractor

Your Guides:
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Introductions

- Take 5 Minutes
- Turn to a Person Near You
- Introduce Yourself



Agenda

- Introduction
- Data Extractor
- Data Processor
- Inbound Integration Architecture

Why Integrate?

- ✓ Eliminate administrative activities
 - ✓ Eliminate double entry
 - ✓ Introduce data consistency
 - ✓ Accommodate trend towards diverse application ecosystem
 - ✓ Facilitate business process
 - ✓ Reduce license costs
 - ✓ Enhance reporting
- ✓ The stereotype associated with developing an integration needs to be debunked.
 - ✓ 10 years ago, integrations were very expensive and technically challenging. Today, with improved integration technology and frequency, integrations are much more cost effective.

Integration Guardrails



Who should be the source?

- Sciforma should NOT be the source of all truth
- Sciforma is a decision-making tool
- It needs the information to make decisions, but not necessarily the source



Is the process mature?

- Integrations are built to match process
- You must detail the process and the flow of information
- You must have a solid repeatable process and be able to identify programmatically the exceptions



Don't over-integrate.

- Weigh the cost (one-time and ongoing) vs. benefit of each integration opportunity
- Understand the accuracy of the source data
- Identify the key integration points and invest in doing it correctly

Error Handling & Testing



Error handling / transaction management

- Errors are inevitable when two different systems are being integrated
- Considerations needed to handle data errors, connectivity errors, and system outages
- Equally important is transaction management and performance considerations



Trial first to avoid errors

- Before you build the complete interface, try a semi-automated load to ensure the process you have defined is correct
 - Get a “win”
- It is crucial to have test environments that mirror the productions as much as possible and that the data is representative of actual production data

Integration Methods

Flat File Transfer

- Simple to develop
- High performing
- Batch style
- Available in SaaS and On-Premise




Web Service

- More complex development
- Slower performing
- Lower volume, more surgical

Database Link

Data Extractor

Data Extractor Overview

-  • Purpose
 - Efficiently pull data from Clarity into flat files
-  • Used For
 - Outbound Integrations
 - Feed reporting tools and data warehouses
-  • Advantages
 - Highly configurable (only code required is a query)
 - Highly performant, efficient, scalable
 - Dynamically produce files based on the provided query
 - Avoids Clarity GEL Script limitations / governors
 - Standardized asset to avoid redundant GEL scripts that produce data extracts

- Output File Path: The path where the file will be produced on the SFTP site
- Output File Name: The file name
- File Extension: The file extension
- Separator: The file delimiter (i.e.: comma, pipe, tab)
- Line Separator: Ability to specify a line separator (LF, CR, LFCR)
- Include Headers: The first row of the file will contain column headers
- File Date Format: A date/time stamp can be added to the file name
- Embed In Double Quotes: Every data element will be embedded in quotes
- Batch Size: Produce multiple files with a set number of rows
- Compress: Zip the output file(s)
- Produce Empty Files: Create the file even if the query does not return data
- Extract Group/Order: Provides the ability to group extracts for a single job run
- Excel Extract / Worksheet Name: Provides the ability to generate excel files (should be used sparingly)
- DWH: Ability to pull data from the DWH or transactional schema

Data Extractor Variables

- Variables can be created and used as bind variables in the query
- Built-in Variables
 - `${gel_processInitiator}` - OOTB User ID of the user that initiated the process
 - `${gel_processId}` - OOTB ID of the process
 - `${gel_processInstanceId}` - OOTB ID of the process instance
 - `${extractCode}` - Code of the Data Extract instance
 - `${extractName}` - Name of the Data Extract instance
- Variables can be set via a sql statement or a gel script
- Variables can also be passed via a custom job

Data Extractor Encryption

- PGP Encryption is supported
- Public key stored in Clarity

Data Extractor Distribution List

- One or more distribution lists can be setup to email the extract file
- Supports Email To, CC, BCC
- Custom HTML emails can be configured
- Custom Branding supported

Data Extractor Storage Setting

- Store Extract in Directory: The file will be stored on the SFTP site
- Knowledge Store: The file will be stored in the Knowledge Store
- Sub-object: The file will be stored in the Extract History sub-object
- These object can be used in any combination

Data Extractor GEL and Checksums

- A GEL script can be executed after the extract is complete
 - Useful for renaming, deleting, moving, SFTP a file
- A Checksum file can be produced
 - Supported hashes: MD5, SHA-256, SHA-512

Data Extractor View

Data Extract: OBS Extract - General - Properties

Actions

General

ID

DWE0008

Name

OBS Extract

Active

☒

Data Warehouse Database

☐

Output File Path

/fs0/clarity1/share/DataExtractor

(Example: /fs0/clarity1/share/)

Output File Name

OBS_Extract

File Extension

.txt

Separator

|

Line Separator

[--Select--]

Excel Extract

☐

(If checked the format of the file will be Excel and the file extension will be.xlsx.)

Include Headers

☒

File Date Format

Embed in Double Quotes

☐

Batch Size

(If a value is supplied here then the number of records per file will be limited to the value.)

Compress

☐

Produce Empty Files

☐

Extract Order

(Order in which extracts are processed)

Extract Group

[--Select--]

(Use to group extracts. Selectable from the job.)

Worksheet Name




SQL

SQL

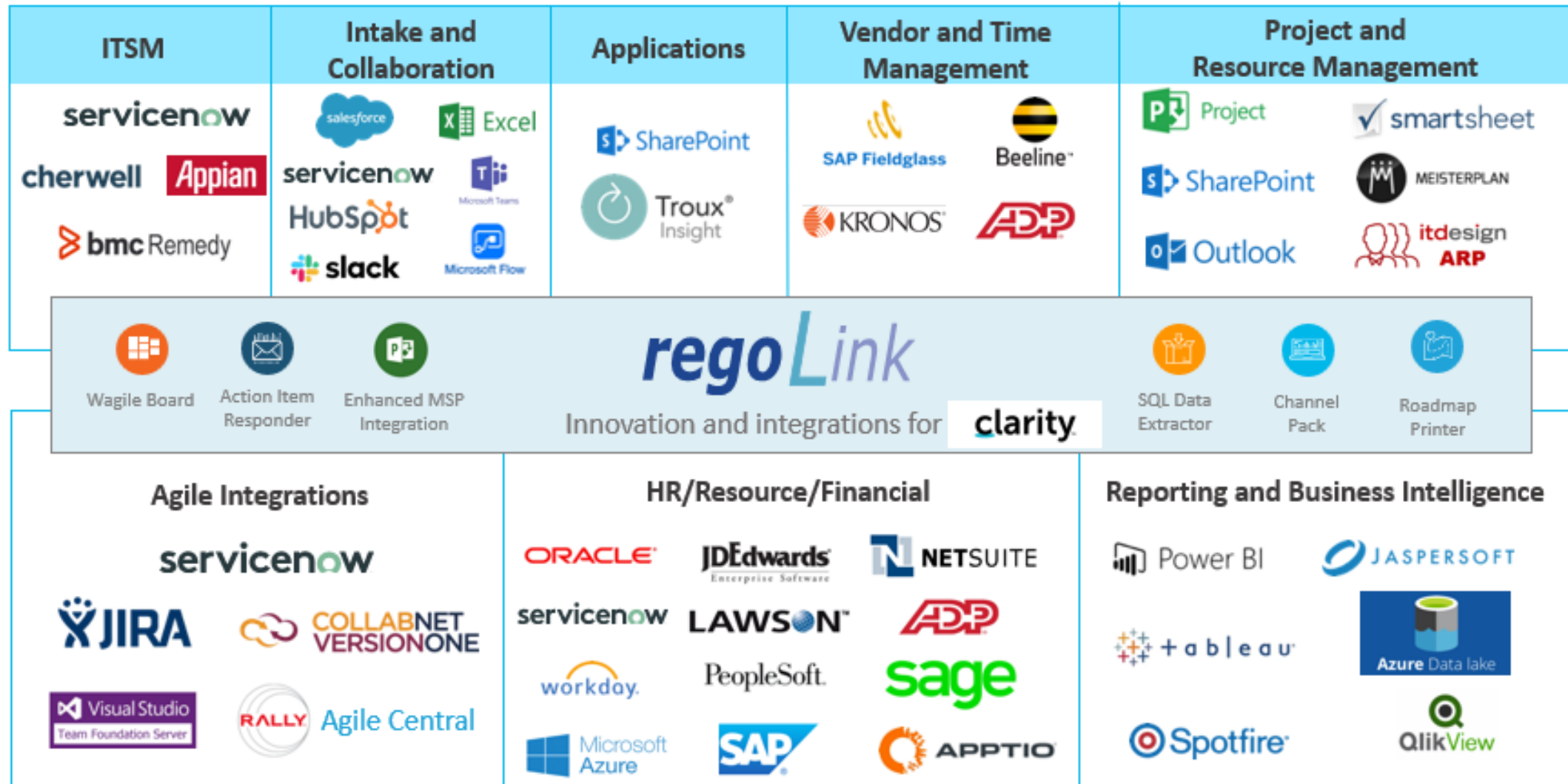
SELECT OBSU.ID
, OBSU.OBS_TYPE_CODE
, OBSU.OBS_TYPE_NAME
, OBSU.OBS_UNIT_CODE
, OBSU.OBS_UNIT_NAME
, OBSU.DEPTH
, SYS_CONNECT_BY_PATH(OBSU.OBS_UNIT_NAME, '/') OBS_PATH
FROM (SELECT OBSU.ID, OBSU.PARENT_ID, OBSU.UNIQUE_NAME OBS_UNIT_CODE, OBSU.NAME OBS_UNIT_NAME, OBSU.DEPTH
, OBST.UNIQUE_NAME OBS_TYPE_CODE, OBST.NAME OBS_TYPE_NAME
FROM PRJ_OBS_TYPES OBST
JOIN PRJ_OBS_UNITS OBSU ON OBST.ID = OBSU.TYPE_ID

Data Processor

Data Processor Overview

-  • Purpose
 - Allow users to configure rather than code inbound integrations
-  • Used For
 - Inbound Integrations
-  • Advantages
 - Allows common integration tasks to be configured
 - Implements best practices and standard approaches for integration tasks
 - Avoids Clarity GEL Script limitations / governors
 - Avoid bloating instance rights table
 - Uses a Connection Manager to securely store authentication credentials

Use Cases



Data Processor Actions

- Import Data to staging objects
 - Import from flat files (PGP encryption supported)
 - Efficiently load large files
 - REST web services
 - Avoid GEL file governors
 - Avoid instance right creation
- Execute SELECT queries
 - Iterate through results
 - Avoid GEL governors
- Execute Web Service Calls
 - Supports REST and XOG
 - Built-in error checking
 - Ability to capture and persist request and response payloads

Data Processor Actions

- Execute DML queries
- Execute a GEL Script
- Write logs to process console

Data Processor Other Actions

- Send Notification: Send an email
- Get the next auto-number
- Get the next database id
- Set parameters
 - Process level variables are supported
 - Variables can be set via a sql statement
 - Variables can also be passed via a custom job
- SFTP: Put and Get are supported
- Invoke a Process

Data Process Properties

- Data Process Metadata
- Debug Level
- Notifications
- Error Reporting

Data Processor: Rego U - Resource Interface - General - Properties

General

Name: Rego U - Resource Interface

ID: regoResourceInterface

Sort Order: 5

Is Active: ☒

Concurrency Action: [--Select--]

Processing Group: [--Select--]

Debug Level: 1

Description: Rego U - Resource Interface

Notifications

Send Notification: ☐

Notification To:

Notify When: Always

Notification To (Group):

Email Initiator: ☐

Processing

Last Run Date: 8/17/2022

Last Run Time (ms): 434

Last Run Instance ID: 5,290,035

Application URL: http://localhost

Error: ☐

Error Description:

Data Process Actions

- Action Types
- Sort Order
- Nested Actions

Data Processor: Rego U - Resource Interface - Data Action List - Properties

| + Filter: None ▾ | | | | | | | | |
|--------------------------|-------------------------------|--------------------------|---------------------------|-------------|----------------|-----------|--------|--------------------------|
| <input type="checkbox"/> | Name | ID | Action Type | Sort Order▲ | Parent Action | Is Active | Commit | Print Results to Console |
| <input type="checkbox"/> | ----- Consume file data ----- | printConsumeFileData | Print Output | 100.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | Truncate Staging Table | truncateStagingTable | SQL Update | 200.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | Load File Data | loadFileData | Import Data - Flat File | 300.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | ----- Validate Data ----- | printValidateData | Print Output | 1,000.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | Flag New Resources | flagNewResources | SQL Update | 1,100.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | Validate Data | validateData | SQL Update | 1,200.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | Flag No Change Records | flagNoChangeRecords | SQL Update | 1,400.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | ----- Update Resources ----- | printUpdateResources | Print Output | 2,000.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | Resource Query | resourceQuery | Data Provider (SQL Query) | 2,100.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | User Xog | userXog | Execute - Xog | 2,200.00 | Resource Query | ✓ | ✓ | |
| <input type="checkbox"/> | Resource Xog | resourceXog | Execute - Xog | 2,300.00 | Resource Query | ✓ | ✓ | |
| <input type="checkbox"/> | Update Warning Records | updateWarningRecords | SQL Update | 2,400.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | Update Unprocessed Records | updateUnprocessedRecords | SQL Update | 2,500.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | ----- Process Summary ----- | printProcessSummary | Print Output | 3,000.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | Summary Query | summaryQuery | Data Provider (SQL Query) | 3,100.00 | | ✓ | ✓ | ✓ |
| <input type="checkbox"/> | Print Summary Results | printSummaryResults | Print Output | 3,200.00 | Summary Query | ✓ | ✓ | ✓ |

Data Process Staging Table

- Stage Imported Data
- Record Status
- Record Details

Rego U Resource Interface List

| Filter: None | | | | | | | | | | |
|--------------------------|---------|-------------|-------------|------------|----------------------|------------------|-----------------|--------|-------------------------|--------------------------------|
| | ID▲ | Resource ID | Last Name | First Name | Email Address | Resource Manager | Employment Type | Is New | Record Status | Record Details |
| <input type="checkbox"/> | 5000348 | jmaddon | Maddon | Joe | jmaddon@cubs.com | | Employee | | No Changes Required | Resource Manager is null; |
| <input type="checkbox"/> | 5000349 | cbosio | Bosio | Chris | cbosio@cubs.com | jmaddon | Employee | | No Changes Required | |
| <input type="checkbox"/> | 5000350 | cedwards | Edwards Jr. | Carl | cedwards@cubs.com | cbosio | Contractor | | No Changes Required | |
| <input type="checkbox"/> | 5000351 | khendricks | Hendricks | Kyle | khendricks@cubs.com | cbosio | Contractor | | No Changes Required | |
| <input type="checkbox"/> | 5000352 | jlester | Lester | Jon | jlester@cubs.com | cbosioZZZ | Contractor | | Processed with Warnings | Resource Manager is not found; |
| <input type="checkbox"/> | 5000353 | twood | Wood | Travis | twood@cubs.com | cbosio | Contractor | | No Changes Required | |
| <input type="checkbox"/> | 5000354 | mmontgomery | Montgomery | Mike | mmontgomery@cubs.com | cbosio | Contractor | | No Changes Required | |
| <input type="checkbox"/> | 5000355 | jlackey | Lackey | John | jlackey@cubs.com | cbosio | Contractor | | No Changes Required | |
| <input type="checkbox"/> | 5000356 | pstrop | Strop | Pedro | pstrop@cubs.com | cbosio | Contractor | | No Changes Required | |
| <input type="checkbox"/> | 5000357 | jarrieta | Arrieta | Jake | jarrieta@cubs.com | cbosio | Contractor | | No Changes Required | |
| <input type="checkbox"/> | 5000358 | jgrimm | Grimm | Justin | jgrimm@cubs.com | cbosio | Contractor | | No Changes Required | |
| <input type="checkbox"/> | 5000359 | achapman | Chapman | Aroldis | achapman@cubs.com | cbosio | Contractor | | No Changes Required | |
| <input type="checkbox"/> | 5000360 | hrondon | Rondon | | hrondon@cubs.com | cbosio | Employee | | Failed Validation | A First Name is required; |
| <input type="checkbox"/> | 5000361 | tlastella | La Stella | Tommy | tlastella@cubs.com | dross | Employee | | No Changes Required | |
| <input type="checkbox"/> | 5000362 | dross | Ross | David | dross@cubs.com | jmaddon | Employee | | No Changes Required | |
| <input type="checkbox"/> | 5000363 | aalmora | Almora Jr. | Albert | aalmora@cubs.com | dross | Employee | | No Changes Required | |
| <input type="checkbox"/> | 5000364 | ccoghlan | Coghlan | Chris | ccoghlan@cubs.com | dross | Employee | | No Changes Required | |
| <input type="checkbox"/> | 5000365 | jbaez | Baez | Javier | jbaez@cubs.com | dross | Employee | | No Changes Required | |
| <input type="checkbox"/> | 5000366 | kbryant | Bryant | Kris | kbryant@cubs.com | dross | Employee | | No Changes Required | |
| <input type="checkbox"/> | 5000367 | bzobrist | Zobrist | Ben | bzobrist@cubs.com | dross | Employee | | No Changes Required | |

Page 1 of 2

Displaying 1 - 20 of 27

Data Process Staging Table

- Records Impacted
- Elapsed Time

| | | |
|-------|--------|---|
| Start | Script | [----- LOAD REGO TOOL KIT -----] |
| Start | Script | Data Processor Loaded. Version: 4.4.4. Elapsed Time: 42(ms). |
| Start | Script | Data Processor executed from the organizer. Executing all active data processes. |
| Start | Script | [----- DATA PROCESS: REGO U - RESOURCE INTERFACE -----] |
| Start | Script | ----- Consume file data ----- |
| Start | Script | Action: Truncate Staging Table (SQL Update). Records: 0. Elapsed Time: 54(ms). |
| Start | Script | Action: Load File Data. File: ResourceFlatFile.txt (Import Data - Flat File). Success Records: 27. Failed Records: 0. Elapsed Time: 8(ms). |
| Start | Script | Action: Load File Data (Import Data - Flat File). Success Records: 27. Failed Records: 0. Elapsed Time: 14(ms). |
| Start | Script | ----- Validate Data ----- |
| Start | Script | Action: Flag New Resources (SQL Update). Records: 1. Elapsed Time: 3(ms). |
| Start | Script | Action: Validate Data (SQL Update). Records: 27. Elapsed Time: 13(ms). |
| Start | Script | Action: Flag No Change Records (SQL Update). Records: 25. Elapsed Time: 54(ms). |
| Start | Script | ----- Update Resources ----- |
| Start | Script | Action: Resource Query (Data Provider (SQL Query)). Status: SUCCESS. Total Records: 1. Success Records: 1. Warn Records: 0. Failure Records: 0. Elapsed Time: 110(ms) |
| Start | Script | Action: Update Warning Records (SQL Update). Records: 0. Elapsed Time: 1(ms). |
| Start | Script | Action: Update Unprocessed Records (SQL Update). Records: 0. Elapsed Time: 1(ms). |
| Start | Script | ----- Process Summary ----- |
| Start | Script | Record Status: Failed Validation. 1 |
| Start | Script | Record Status: No Changes Required. 25 |
| Start | Script | Record Status: Processed with Warnings. 1 |

Inbound Integration Architecture

Interface Architecture

- Import Data to staging table
- Derive Data
 - Unique Identifiers/Keys between both systems
 - Apply transformation logic and mappings
- Validate Data
 - Confirm derived data meets business rules
 - Ensure data meets Clarity's requirements
- Error Handling and Validation
 - Provide a record status on every record
 - Provide descriptive messages
- Load Data
 - Avoid unneeded data updates
 - Provide granular results and details

Best Practices and Recommendations



Avoid over integrating or unnecessary complexity



Use reusable and resilient assets and development



Understand Clarity's capabilities and limitations



Provide citizen developer assets vs development shops



Be mindful of performance, security and handling of data



Specific to Clarity:

- Increase adoption of the REST API
- Use Flat Files for large volume batch interfaces

When to use

- Tried and true data exchange method
- Available for On-Premise and SaaS
- Batch interfaces
- Large data volume
- Secure (During transit and processing)
- Avoids having to expose your network or applications

When not to use

- Real time interfaces
- Small, surgical volume
- Poorly performing REST APIs

Best Practices and Recommendations

When to use

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Questions?





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- Click on **Maintain My Certification**
- Click on **Visit CCR's** button under the **Report PDU's**
- Click on **Report PDU's**
- Click on **Course or Training**
- Class Provider = **Rego Consulting**
- Class Name = **regoUniversity**
- Course **Description**
- Date Started = **Today's Date**
- Date Completed = **Today's Date**
- Hours Completed = **1 PDU per hour of class time**
- Training classes = **Technical**
- Click on **I agree** and **Submit**



Let us know how we can improve!
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