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Integrations with Rego Data Processor and Data Extractor
Your Guides:
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Part I: Introduction

Agenda

- Understanding Clarity and its Architecture
- Why use Integrations
- Rego’s Integration Tools
  - Data Extractor
  - Data Processor
- Rego’s Integration Approach

Understanding Clarity's Architecture

Understanding Clarity

- Clarity's Services:
  - Application Service:
    - Web application, acts as Clarity's end user facing service to access the UI
    - Exposes Clarity's XOG Webservice (SOAP based Services)
    - Exposes Clarity's REST API
  - Process Engine and Job Scheduler:
    - Acts as Clarity's automation engine
    - Can run custom script (based on GEL/Apache Jelly) to ingest files and connect to other applications
- Connectivity and Capabilities
  - XOG (SOAP Webservice)
  - REST API
  - SFTP (SaaS AWS and SaaS GCP)
  - ODATA (SaaS AWS and SaaS GCP)

Clarity Web Services: SOAP

- Legacy API
- Simple Object Access Protocol (SOAP)
- Uses only XML for messaging
- Interface is defined in a WSDL (Web Service Description Language) file
- Can be complex to build and parse requests
- Object based

Pros	Cons
Been in the product since the beginning	No new UX support
Easy to work with	XML will have a larger payload
All new custom objects get their own WSDL	Can occasionally differ from core functionality
	Outdated functionality compared to REST API i.e. Financial Plans, Transactions, etc.

Clarity Web Services: REST

- Actively being invested on, on latest releases
- Actively used throughout the application and OOTB functionality:
  - New UX Operations
  - Rally Integration
- Provides functionality:
  - Read/write well known objects related to Projects and New UX functionality
  - Multiple authentication mechanisms (basic, token and API Key)
  - Available documentation via “describe” URLs, following industry standards

Pros	Cons
Industry standard	No dot walking support
Easy to work with	Not all tables have public REST API’s
Can call external product REST API’s (have always been able to do this)	The new UX is built on top of the REST API’s ensuring continuity

Clarity Web Services: ODATA

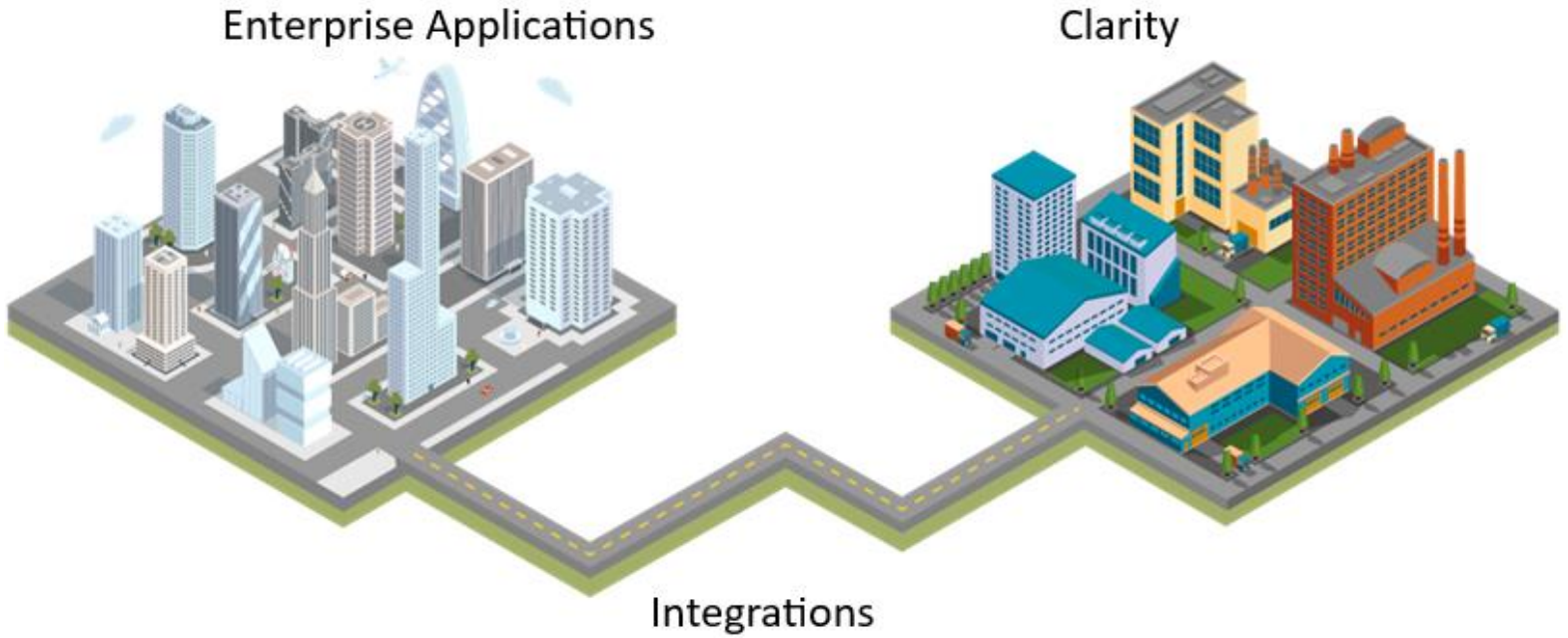
- REST protocol; open standard
- Primarily used in the industry for BI tools and Reporting applications
- Used within Clarity for access to the Data Warehouse

Pros	Cons
Provides industry standard access	Only supports the Data Warehouse schema
Most BI tools support ODATA	Not supported for Clarity On Premise
Being improved due to the EOL for Jasper Report	Hosted by third party software

Why use Integrations?

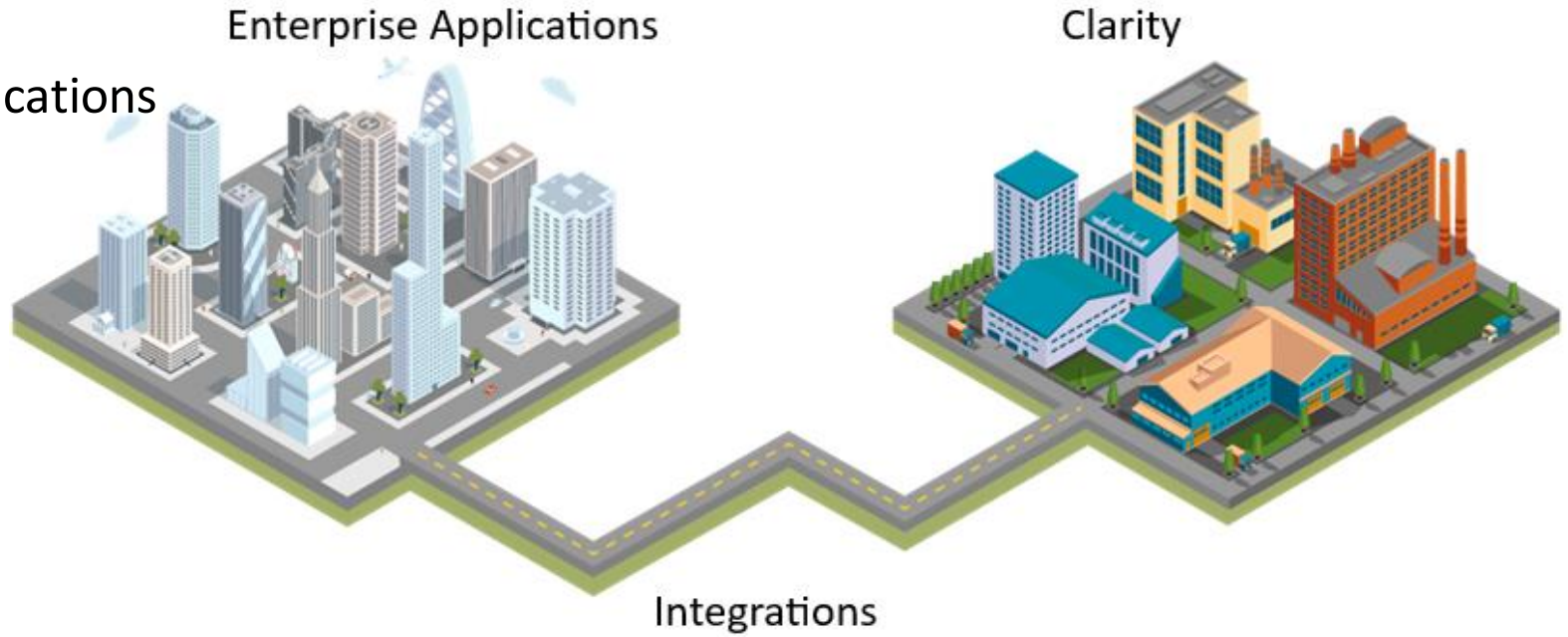
Understanding Integrations

- Organizations have a varied ecosystem, relying on multiple applications with specialized enterprise functionality.
- Organizations are becoming more flexible, allowing teams to work and use their own applications, increasing the complexity of the ecosystem.
- Data is becoming a valuable asset and deriving insights is key for Organizations to meet their goals.

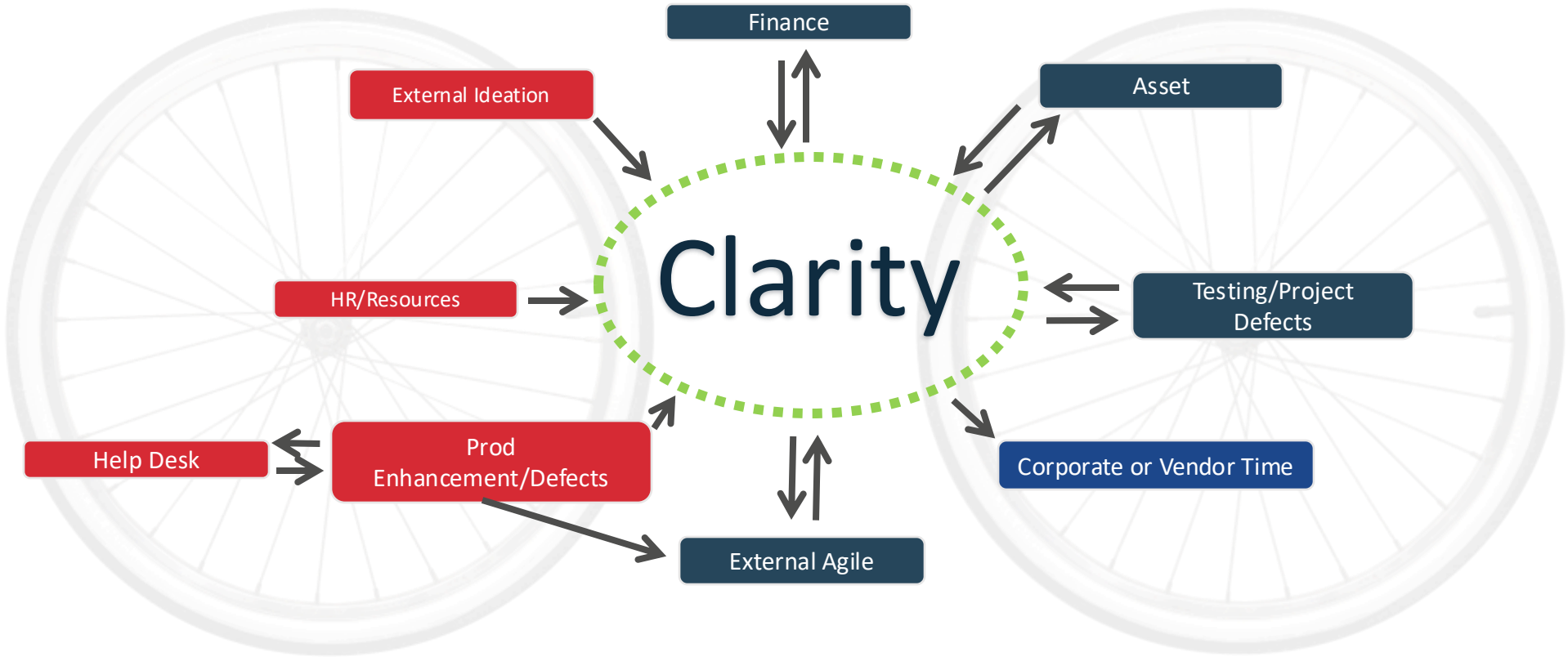


Understanding Integrations

- Integrations are intended to close the gap between different ways of working and applications.
- They provide immediate benefits like:
  - Data quality
  - Avoiding double entry
  - Benefits in performance, cost, and time
  - License costs savings
  - Disseminating data across applications



Wheel and Spoke



Common Use Cases

- HR (Workday, Peoplesoft, SAP, Oracle, Active Directory)
  - User provisioning
  - Employee/Resource reporting data
- Financial (SAP, Oracle)
  - Timesheet data
  - Financial transactions
  - Cost plans
- Organizational Data
  - Organizational Structure (OBS)
  - Master data (Lookups, Mapping tables, etc.)
- Project Management
  - Time reporting
  - Project structure (Projects, Teams, Tasks, etc.)

Clarity Common Interfaces

Inbound:

- User/Resource provisioning
- Financials
  - Transactions
  - Budgets (Cost Plans)
- Departments and OBS
- Timesheet
- Investments (i.e. Projects, Ideas, CITs)
- Rate Matrix
- Resource Calendar

Data Extractor

Outbound Integrations

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

Data Extractor Features

- Provides functionality not native to the application:
  - Large datasets can be extracted quickly. (Use case: Customer doing a daily DWH dump, over 40 million records across 40 files)
  - Chain extracts together
  - Dynamic file names with flexible date formatting
  - Configurable file formats (column separators / line separators)
  - Supports PGP encryption
  - Store files on the SFTP Site, Knowledge Store, and/or distribute via email
  - Produce embedded or non-embedded data
  - Produce files with or without header row
  - Supports batching
  - Support zipped files
  - Produce empty Files

Data Extract Configuration

Data Extract: Extract 1 - General - *Properties*

General

ID	DWE0001	Include Headers	☑
Name	Extract 1	File Date Format	yyyy-MM-dd
Active	☑	Embed in Double Quotes	☐
Data Warehouse Database	☐	Batch Size	
Output File Path	C:\Users\dmatz\Documents\General\Data Extractor		(If a value is supplied here then the number of records per file will be limited to the value.)
Output File Name	zExtract1	Compress	☐
File Extension	.txt	Produce Empty Files	☐
Separator	||	Extract Order	1
Line Separator	LF (typically \n, 10 or 0x0A)		(Order in which extracts are processed)
		Extract Group	Group 1
			(Use to group extracts. Selectable from the job.)

SQL

SQL

```
SELECT INVI.ID
, INVI.CODE
, INVI.NAME

FROM INV_INVESTMENTS INVI

WHERE 1=1

ORDER BY INVI.ID
```

Data Processor

Inbound Integrations

Data Processor Overview

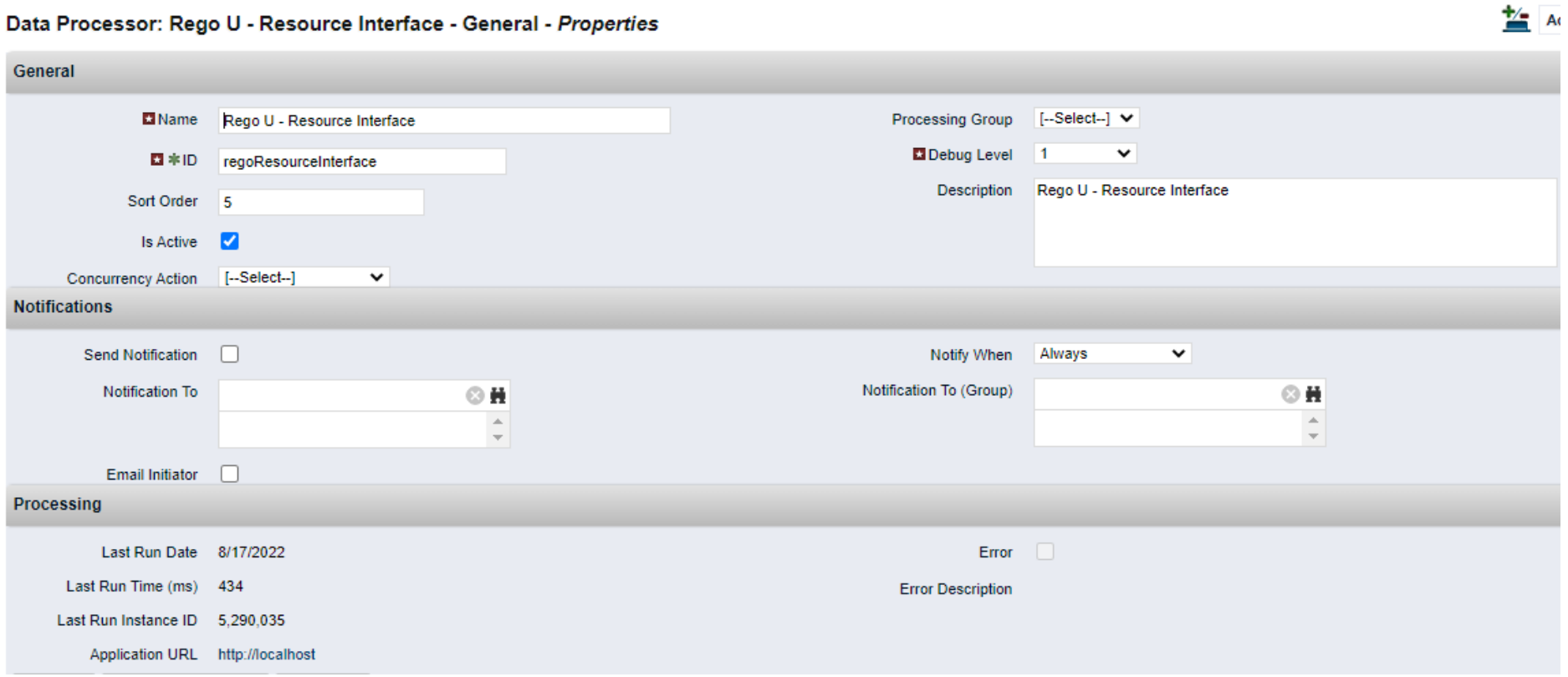
- Purpose
  - Allow users to configure rather than code inbound integrations
- Used For
  - Inbound Integrations
- Advantages
  - Allows common integration tasks to be configured
  - Implements best practices and standard approaches for integration tasks
  - Avoids Clarity GEL Script limitations / governors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

Data Processor Actions

- Import Data to staging objects
  - Import from flat files (PGP encryption supported)
  - REST web services
  - Efficiently load large files, avoid GEL file governors
- Execute DML queries
- Execute SELECT queries and iterate through results (avoid GEL governors)
- Execute XOG
- Execute REST
- Capture XOG/REST exceptions and persist errors
- Write logs to process console

Data Process Properties

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



Data Process Actions

- Action Types
- Sort Order
- Nested Actions

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

Filter: None

Name	ID	Action Type	Sort Order	Parent Action	Is Active	Commit	Print Results to Console
------ Consume file data ------	printConsumeFileData	Print Output	100.00		✓	✓	✓
Truncate Staging Table	truncateStagingTable	SQL Update	200.00		✓	✓	✓
Load File Data	loadFileData	Import Data - Flat File	300.00		✓	✓	✓
------ Validate Data ------	printValidateData	Print Output	1,000.00		✓	✓	✓
Flag New Resources	flagNewResources	SQL Update	1,100.00		✓	✓	✓
Validate Data	validateData	SQL Update	1,200.00		✓	✓	✓
Flag No Change Records	flagNoChangeRecords	SQL Update	1,400.00		✓	✓	✓
------ Update Resources ------	printUpdateResources	Print Output	2,000.00		✓	✓	✓
Resource Query	resourceQuery	Data Provider (SQL Query)	2,100.00		✓	✓	✓
User Xog	userXog	Execute - Xog	2,200.00	Resource Query	✓	✓	
Resource Xog	resourceXog	Execute - Xog	2,300.00	Resource Query	✓	✓	
Update Warning Records	updateWarningRecords	SQL Update	2,400.00		✓	✓	✓
Update Unprocessed Records	updateUnprocessedRecords	SQL Update	2,500.00		✓	✓	✓
------ Process Summary ------	printProcessSummary	Print Output	3,000.00		✓	✓	✓
Summary Query	summaryQuery	Data Provider (SQL Query)	3,100.00		✓	✓	✓
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
5000348	jmaddon	Maddon	Joe	jmaddon@cubs.com		Employee		No Changes Required	Resource Manager is null;
5000349	cbosio	Bosio	Chris	cbosio@cubs.com	jmaddon	Employee		No Changes Required	
5000350	cedwards	Edwards Jr.	Carl	cedwards@cubs.com	cbosio	Contractor		No Changes Required	
5000351	khendricks	Hendricks	Kyle	khendricks@cubs.com	cbosio	Contractor		No Changes Required	
5000352	jlester	Lester	Jon	jlester@cubs.com	cbosioZZZ	Contractor		Processed with Warnings	Resource Manager is not found;
5000353	twood	Wood	Travis	twood@cubs.com	cbosio	Contractor		No Changes Required	
5000354	mmontgomery	Montgomery	Mike	mmontgomery@cubs.com	cbosio	Contractor		No Changes Required	
5000355	jlackey	Lackey	John	jlackey@cubs.com	cbosio	Contractor		No Changes Required	
5000356	pstrop	Strop	Pedro	pstrop@cubs.com	cbosio	Contractor		No Changes Required	
5000357	jarrieta	Arrieta	Jake	jarrieta@cubs.com	cbosio	Contractor		No Changes Required	
5000358	jgrimm	Grimm	Justin	jgrimm@cubs.com	cbosio	Contractor		No Changes Required	
5000359	achapman	Chapman	Aroldis	achapman@cubs.com	cbosio	Contractor		No Changes Required	
5000360	hrondon	Rondon		hrondon@cubs.com	cbosio	Employee		Failed Validation	A First Name is required;
5000361	tlastella	La Stella	Tommy	tlastella@cubs.com	dross	Employee		No Changes Required	
5000362	dross	Ross	David	dross@cubs.com	jmaddon	Employee		No Changes Required	
5000363	aalmora	Almora Jr.	Albert	aalmora@cubs.com	dross	Employee		No Changes Required	
5000364	ccoghlan	Coghlan	Chris	ccoghlan@cubs.com	dross	Employee		No Changes Required	
5000365	jbaez	Baez	Javier	jbaez@cubs.com	dross	Employee		No Changes Required	
5000366	kbryant	Bryant	Kris	kbryant@cubs.com	dross	Employee		No Changes Required	
5000367	bzobrist	Zobrist	Ben	bzobrist@cubs.com	dross	Employee		No Changes Required	

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Displaying 1 - 20 of 27

Data Process Output

- 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
      - Good performing REST APIs

Questions?

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Surveys

Please take a few moments to fill out the class survey.
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- 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**
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- Click on **I agree** and **Submit**

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