SCIKIG



DATA INTEGRATIONWITH SAP

Table of Contents

What is SCIKIQ	3
Introduction to SCIKIQ Connect	
Build a Data Lake on Cloud or On Premises	
Steps to build a Data Lake on Cloud or On Premises	
SAP Data Migration	6
Process Migration	11
Historic Data Load	15
Incremental or Daily Delta Jobs	16
Real Time Data Capture	17
Benchmarking with SAP OData Consumption	20



What is SCIKIQ

If your organization is running a *Digital Transformation program or building a new information-centric revenue streams* you need to invest in Data Integration and overall Data Management Platform that will make the accurate and trusted information accessible and available to business teams and corporate functions in a format which is easy to consume and act upon.

SCIKIQ is a *first-of-its-kind AI* driven business data fabric that delivers a trusted and real time view of data across an enterprise *in days or weeks instead of months and years* by integrating and governing data from multiple data stores and business applications *to deliver the right data, at the right time and in the right format to the right data consumer.*

SCIKIQ combines different data integration design patterns, utilizes active metadata, knowledge graphs and Machine Learning to augment data integration and data delivery tasks, across all environments, including hybrid and multicloud platforms.

Introduction to SCIKIQ Connect

SciklQ Connect i.e., SciklQ Data Integration layer is a NO Code Data Integration and Data Transformation Platform that let our client teams to effortlessly centralize all the data & build single version-of-truth thereby enabling them to make faster, smarter & confident decisions using data.

Using SciklQ Connect, client teams can build and deploy Data Integration and Data Transformation Pipelines without writing a single line of Code. The engine takes care of all the complexities in the background thereby save time and engineering effort - hence creating bandwidth for the client team to work on actual value-added activities and making sense from the data.

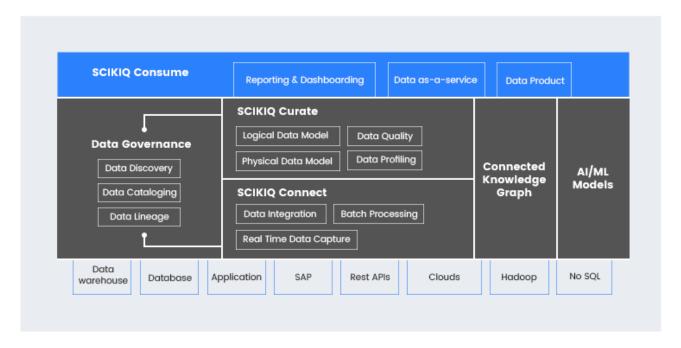
Having dealt with the pain of Integrating data across organizational silos and boundaries, we have architected the product so that it is easy to use and achieves reduction in the *DATA-TO-ACTION* timeframe from years and months to days. We help our clients save a tremendous amount of time by eliminating the need to build, integrate & maintain complex data pipelines.

SciklQ Connect is designed to enable business team to drive value from the data and focus on business growth rather than worrying about how the data needs to be stitched together.

Build a Data Lake on Cloud or On Premises

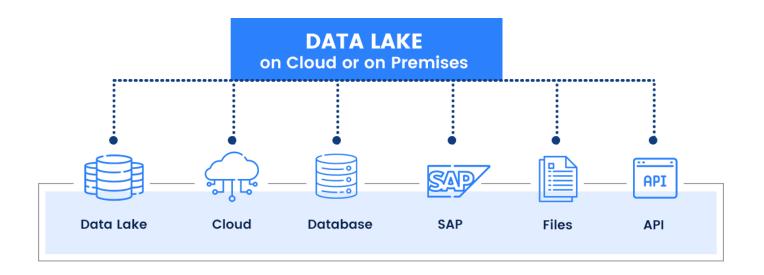
ScikIQ Connect helps you connect with both Structured and Unstructured Sources of Data. Using its out-of-box integration, you can connect to the following:

- Data warehousing Products
- Databases
 - RDBMS, Columnar, NO SQL
- Application Stores
 - o SAP, Sales Force, Oracle etc
- File System
 - o FTP, SFTP, Drop Boxes, Parquet, ORC, Avro, CSV, Excel
- Hadoop Ecosystem
 - o Hive, Impala, HDFS
 - o Hadoop Ecosystem
- Real Time Sources Kafka Confluent
- Log based CDC using Debezium
- Process Migration something unique to ScikIQ If business users, it allows you to capture data using Standard Process Migration Recipes

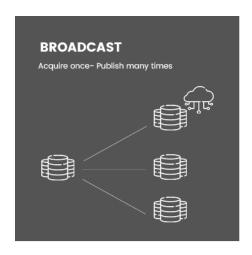


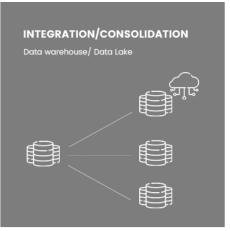
Steps to build a Data Lake on Cloud or On Premises

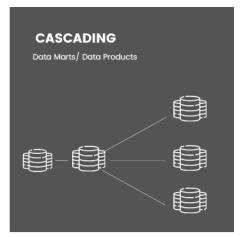
- 1. Migrate Historic Load through Data Migration Module
- 2. If you are process owner, migrate your process data from underlying ERP using Process Migration Module
- 3. Setup Batch Data Load Process
 - ✓ Setup Load Strategy Delta or Truncate/Load
 - ✓ Create Data Pipeline
 - ✓ Schedule Data Pipeline
- 4. Setup Real Time Data Load using KAFKA Source and Sink Connection
- 5. Setup API/File Sources on Batch or Real Time Consumption
- 6. If Database connection is not allowed and APIs are not open, we can still migrate data and identify CDC using Log Mining techniques

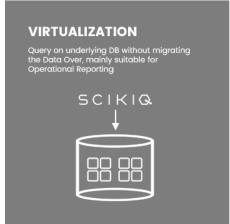


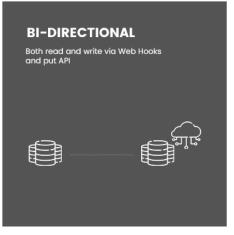
We support the following Data Transfer Topologies

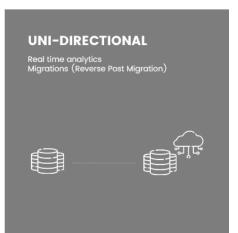












SAP Data Migration

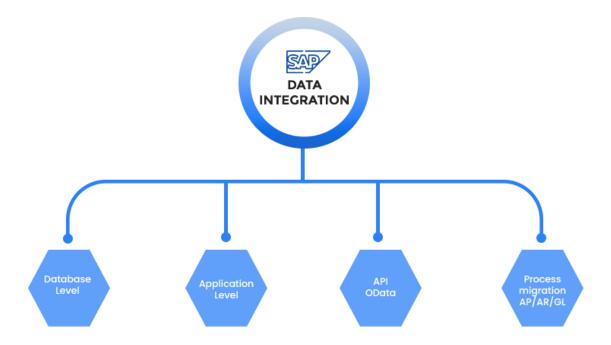
With ScikIQ, you can extract data from a full range of SAP including SAP HANA, ECC 6.0 or SAP BW with just a few clicks. Through it NO Code Data Integration and Data Transformation Platform it let our client teams to effortlessly centralize all the data & build single version-of-truth thereby enabling them to make faster, smarter & confident decisions using data.

SciklQ Data Integration module for SAP helps customer build fully governed Data Lake on Cloud or on Premise by extracting data from multiple sources including SAP and overlaying it on a strong Data Governance and Data Cataloging Framework via SciklQ Control Module.

Non-SAP Products capabilities required to Compliment SAP Data Transfer Methodology

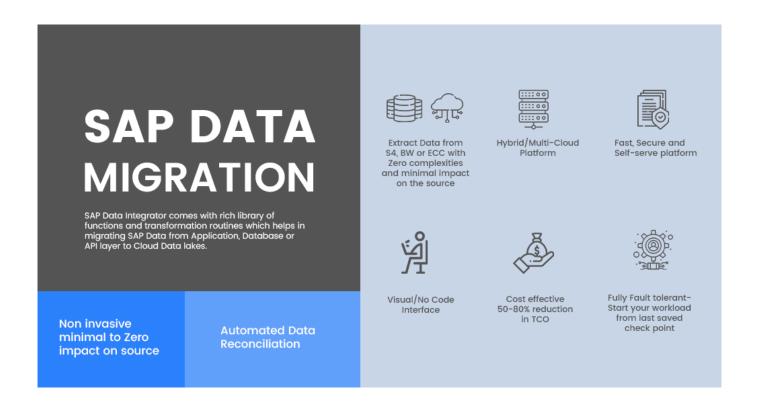
- ✓ Data Lake capabilities
- ✓ Next gen AI capabilities & ease of integration with open-source tools
- ✓ Integration of streaming & unstructured data
- ✓ Self Service Capabilities
- ✓ Data Quality, & Governance

ScikIQ supports SAP Data Extraction from SAP using following methodologies



- Database Level: Extraction Framework at Database Level extracts raw data as it is being written to SAP database, transform the data to consumable formats with the required mappings and writes on a target database i.e., Snowflake or Vertica.
- 2. **Application Level:** SciklQ uses Remote Function Call libraries to natively connect and extract data from remote function modules, views, tables, and queries.
- 3. OData: SAP OData connectors allow you to browse different OData services exposed in the SAP server through its Catalog service. You can select any service of your choice, retrieve the meta-data of various entities exposed in the selected service and then design a job within SciklQ to extract data for the given entity set.

4. **Process Migration**: Select AR, AP, GL or P2P process and let ScikIQ pull the data out of all the related tables from SAP for Process Consumption and Dashboarding



Advantages

- Non-Invasive/ Minimal to Zero Impact on Source
- Automated Data Reconciliation
- Extract Data from S4, BW or ECC with Zero Complexities and minimal Impact on the Source
- Fully Fault Tolerant Start your Workload from last saved Check point
- Hybrid/ Multi-Cloud Platform
- Visual/NO Code Interface
- Cost Effective ~50-80% reduction in TCO
- Fast, Secure and Self-Serve Platform

SciklQ supports infrastructure on demand, that means a new infrastructure can be automatically spined up to perform certain task, whenever there is a requirement or on a scheduled time a new POD can be spined without manual effort or coding required.

SciklQ maintains states of the tasks at all levels, so if certain task failed at some point of time, then user can easily check error details and can restart the task or resume the task from the current state.

SciklQ is a multi-tier application were multiple micro-services talks to each other. SciklQ supports horizontal as well as vertical scaling. Either few micro-services or all micro-services can be scaled. Elastic & APM has been integrated with SciklQ for robust logging and application performance monitoring.

Data Integration - SAP S/4 HANA

The following table highlights the high-level Capabilities of any Data Integration tool which can extract data from SAP ERP i.e., Enterprise Resource Planning Software

Source Object	Туре	Extraction Mode	Scenario Detail
		Full	Extract the complete data set from transparent table such as Sales Header, Sales Item, Billing Item.
Table	Transparent	Delta	Extract delta records based on timestamp, incremental column such as Sales Header, Sales Item, Billing Item.
	Clustered	Full	Extract the complete data set from clustered table such as BSEG.
		Delta	Extract delta records based on timestamp, incremental column from a clustered table such as BSEG.
	Standard	Full & Delta	Extract data (Full & Delta) from SAP provided standard extractors
Extractor	Custom	Full	Extract data from customer developed extractors such as Sales Order, GL Accounts Balance, Billing extractors.
		Delta	(1) Extract data from customer developed extractors, should bring only delta records which are posted after the initial extractions.
			(2) Some custom extractors are not enabled with Delta, in such scenarios based on time column or incremental column from extractor extract only delta postings.
	Standard/Custom	Full	Extract the data from ABAP CDS view
ABAP CDS Views		Delta	(1) Extract only delta postings from ABAP CDS view such as I_SALESORDERITEMCUBE.
			(2) Not all the CDS views are enabled with delta extractions in those scenarios extract delta postings based on time field or incremental column from CDS views.

Data Integration - BW on HANA/BW4HANA

SAP Enterprise Data Warehouse has functionalities such as data modelling, administration, and provision management. It integrates multi-source data, aggregates, and transforms data, carries out data cleansing and stores data. The following table highlights the high-level Capabilities of any Data Integration tool which can extract data from SAP BW i.e. SAP Data Warehouse

Source Object	Туре	Extraction Mode	Scenario Detail
Info Object	Master Data	Full	(1) Time independent: Extract Customer master and text data from generated HANA View. (2) Time Dependent: Extract Material master and text data from generated HANA View.
DSOs/ADSOs	Write Optimized	Full & Delta	(1) For one-time load, extract the data from ADSO generated HANA VIEW for objects such as Sales Order, Billing, Shipment, General Ledger ADSOs. (2) For subsequent Delta extractions, based on Request ID fetch the delta request data from ADSO generated HANA view for objects such as Sales Order (ADSO).
	Standard	Full & Delta	 For one-time load, extract the data from ADSO generated HANA VIEW for objects such as Sales Order, Billing, Shipment, General Ledger ADSOs. For subsequent delta extractions, fetch delta postings for Sales Order, Billing, Shipment, General Ledger ADSOs. Based on Creation/Change Date fields from ADSO generated HANA view extract the delta postings.
Open Hub Destination (OHD)	Table & File	Full	Extract data from objects such as Purchase Order, Purchase Order Item OHD.

Data Integration - ECC ON HANA

Source Object	Туре	Extraction Mode	Scenario Detail
	Transparent	Full	Extract the complete data set from transparent table such as Sales Header, Sales Item, Billing Item.
		Delta	Extract delta records based on timestamp, incremental column such as Sales Header, Sales Item, Billing Item.
Table	Clustered	Full	Extract the complete data set from clustered table such as BSEG.
		Delta	Extract delta records based on timestamp, incremental column from a clustered table such as BSEG.
	Standard	Full & Delta	Extract data (Full & Delta) from SAP provided standard extractors
	Custom	Full	Extract data from customer developed extractors such as Sales Order, GL Accounts Balance, Billing extractors.
Extractor		Delta	(1) Extract data from customer developed extractors, should bring only delta records which are posted after the initial extractions.
			(2) Some custom extractors are not enabled with Delta, in such scenarios based on time column or incremental column from extractor extract only delta postings.
	Standard/Custom	Full	Extract the data from ABAP CDS view
ABAP CDS Views		Delta	(1) Extract only delta postings from ABAP CDS view such as I_SALESORDERITEMCUBE. (2) Not all the CDS views are enabled with delta extractions in those scenarios extract delta postings based on time
			field or incremental column from CDS views.

ScikIQ Interface - Making it Simpler

Process Migration

At ScikIQ, we constantly challenge ourselves and work hard to *make lives simpler for our data consumers*. We understand that the average process owner does not understand the full landscape and inter dependencies between technical data landscape.

These set of Screens helps business or non-technical user to migrate the data for their process to new Data Lake. Our Functional experts have identified key data attributes and KPIs for the business processes so that the Process Owner does not have to struggle to understand the relationship among different data objects.

See below the KPIs, we capture for Account Payable Process

	For how much average time invoices are still under approval?			
Parked Invoices	What is the total amount, currency key wise?			
	How many invoices are under workflow approval?			
	How many invoices are currently blocked?			
	What is the count of blocked invoices, block indicator/reason-wise?			
Blocked Invoices	What is the total amount, currency key wise?			
	For how much average time invoices are blocked?			
	How many due invoices without any payment block are still open?			
	How much average time is taken for an invoice to be received and then finally processed?			
Invalor Land Time / Develop Anima	Approval workflow time			
Invoice Lead Time / Payable Aging	How much average time is taken for a processed invoice to be finally paid?			
	What are the absolute number of overdue days as of today?			
Days Payable	What is the average total amount payable outstanding over the last 12 month (month-wise)?			
	What is the total amount, currency key wise?			
Suppliers with Dahit Balances	Aging of total debit balances line items			
Suppliers with Debit Balances	What is the breakup of amount supplier wise			
	Is there any supplier balance on Special GL indicator, e.g advance?			
Total Number of Invoices	How many invoices are posted in current period?			
Period-wise / Current period / Year- wise	How many invoices are posted in N number of month / Years (comparison)?			
	What is the expense GL-wise break of number of open invoices?			
Expense Head-wise Invoices	What is the expense GL-wise break of amount of all invoices (open & cleared)?			
•	What is the expense GL-wise open invoices count?			
	What is the expense GL-wise all invoices count (open & cleared)?			
	What is the count of usernames used to process invoice?			
Cost of processing an invoice	What are the number of invoices processed by user per day/month/year?			
	What is the average value of invoice processed by a user?			

Percentage of invoices related to a	What is the count/number of invoices directly booked in FI?		
purchase order (PO)	What is the count/number of invoices coming through MM?		
Number of Reversals/Errors	What is the count/number of invoices getting reversed?		
	What is the count/amount of open credit memos?		
Credit Memo Analysis	What is the count/amount of cleared credit memos?		
	How much average time is taken for a credit memo to be cleared?		
One by Diagona to the time and a second	How much cash discount taken during the period?		
Cash Discount Utilization	How much cash discount lost during the period?		

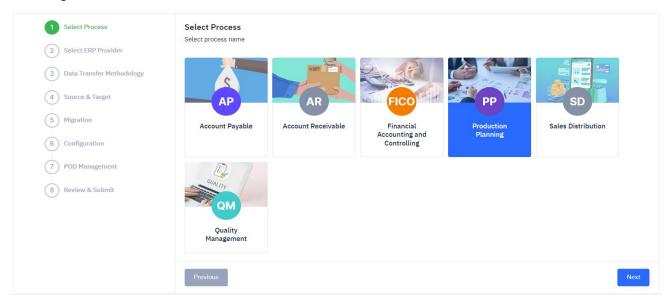
See below the KPIs, we capture for Account Receivable Process

	For how much average time billing documents are still under approval?
Parked Invoices	What is the total amount, currency key wise?
	How many billings document are under workflow approval?
Billing document Lead Time /	How much average time is taken for a processed invoice to be finally paid?
Receivables Aging	What are the absolute number of overdue days as of today?
Days Receivables	What is the average total amount receivable outstanding over the last 12 month (month-wise)?
	What is the total amount, currency key wise?
Customers with Debit Balances	What is the breakup of amount supplier wise
	Is there any customer balance on Special GL indicator, e.g advance?
Total Number of Billing Documents Period-wise / Current period / Year-	How many invoices are posted in current period?
wise	How many invoices are posted in N number of month / Years (comparison)?
Type of Revenue Breakup	What is the Revenue GL(s)-wise break of amount of billing document? e.g., local vs foreign
	What is the Revenue GL-wise billing document count?
	What is the count of usernames used to process invoice?
User-names	What are the number of billing document processed by user per day/month/year?
	What is the average value of revenue document processed by a user?
Percentage of invoices related to a sale	What is the count/amount of billing document directly booked in FI?
order (SO)	What is the count/amount of billing document coming through SD?
Number of Reversals/Errors	What is the count/amount of billing document getting reversed?
Debit Memo Analysis	What is the count/amount of debit memos?
Cash Discount Utilization	How much cash discount given during the period?
Cush Discount Othization	How much cash discount lost by customer during the period?
Disputed Invoices	How many invoices are currently under dispute?
Days Beyond Term	How many billing documents are past net due date?
Days Deyona Term	What is the total amount of billing documents are past net due date?

The following sections list down the steps required to migrate the Data using Process Migration Flow.

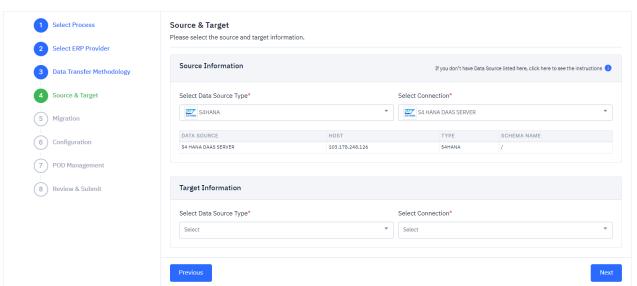
01 Select the Process

Process Migration



02 Select the Target where Migrated Data will be stored

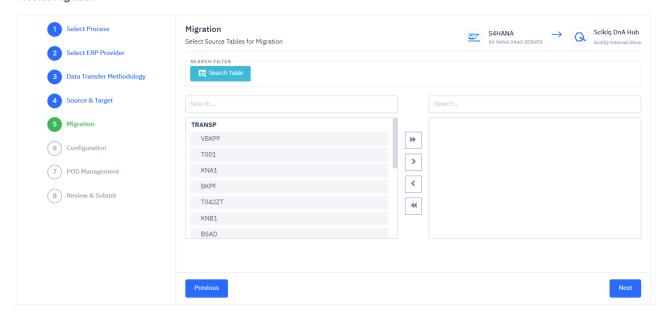
Process Migration



03 Tables and Objects are pre-selected. You can add custom tables by selecting the tables using Search Table Button.

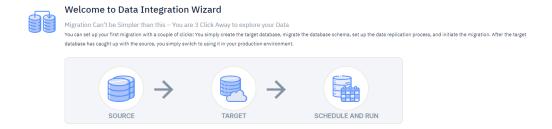
This provide flexibility and extensibility to the SAP users as we understand that many table have been added/customized during SAP Implementation.

Process Migration

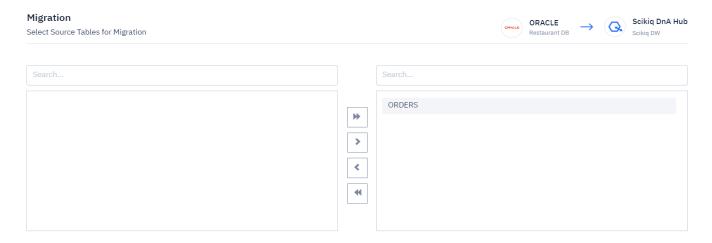


Historic Data Load

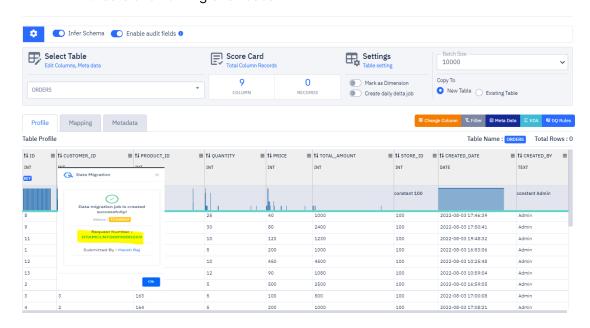
01 Select the source and target (Typically MPP like Vertica, Snowflake, Big Query etc.)



02 Pickup the Tables to be Migrated

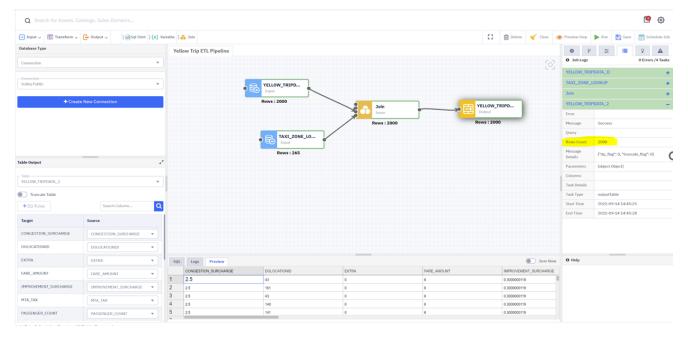


- Analyze the data, metadata, Data Quality rules before you ingest
 - Assign Infra as a Code
 - Create and Run Migration Jobs

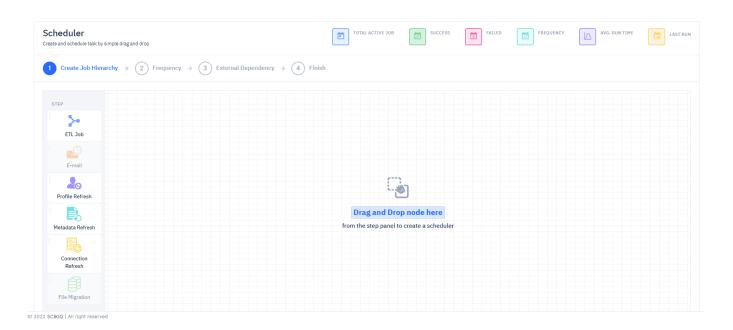


Incremental or Daily Delta Jobs

01 Create Delta Jobs using Business Date as CDC

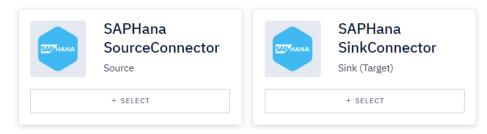


$oldsymbol{02}$ Schedule Job using SciklQ Scheduler

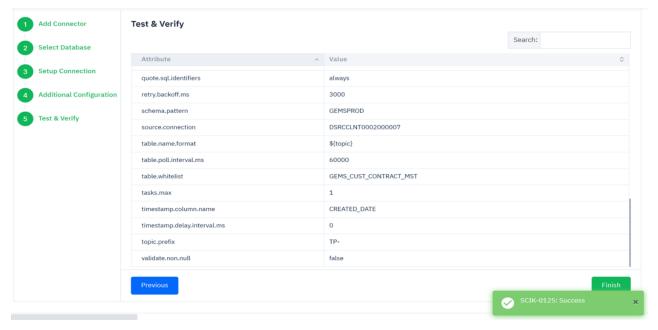


Real Time Data Capture

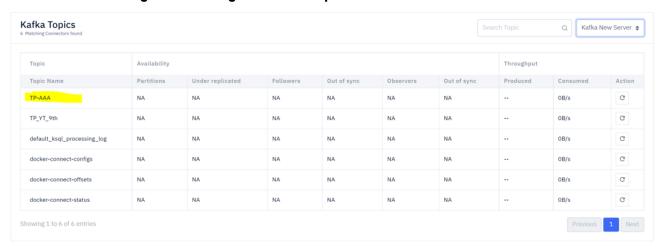
Create SAP Source/Sink Connector



Setup and Verify the Config for Source and Sink



Start Consuming or Publishing the KAFKA Topic for Real Time Use Cases



ScikIQ API Hub

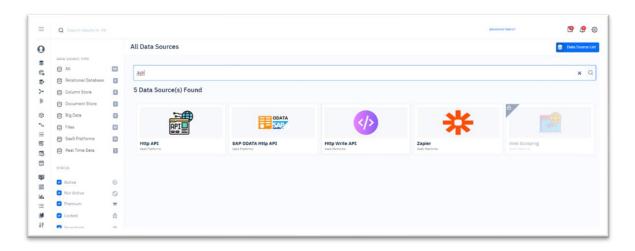
SciklQ offers a lightweight integration platform that allows you to connect anything, anywhere. It includes all the essential components for end-to-end integration of external APIs and internal applications.

Use the API Integration Hub of SciklQ to consume data directly from a specific Rest API, to publish data directly via a REST API and to extract data from the Data Catalogs or Reporting Tools. The hub provides a single point of entry for API integrations resulting in faster and cheaper development enabled by a standardized approach to systems integration.

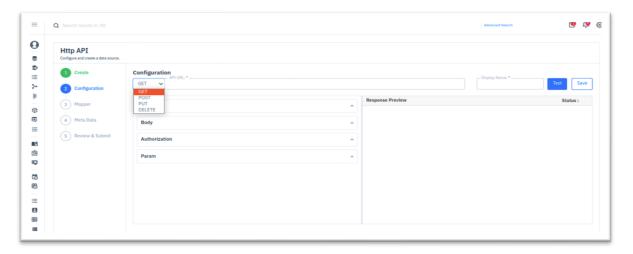
Drag-And-Drop Visual Flow Designer

- SciklQ's no-code, visual flow designer allows complex data flows to be defined and set up in minutes.
- With SciklQ, users can leverage the visual designer to easily build process flows that connect files, messages, applications and databases.
- Processes can be triggered from file or message-based events, webhooks, an embedded scheduler, or based on any number of application events.
- ScikIQ can ingest data via API. It works on both pull and push model.

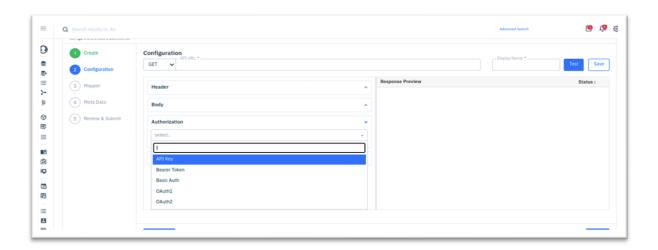
See below the API Integration Capabilities of ScikIQ



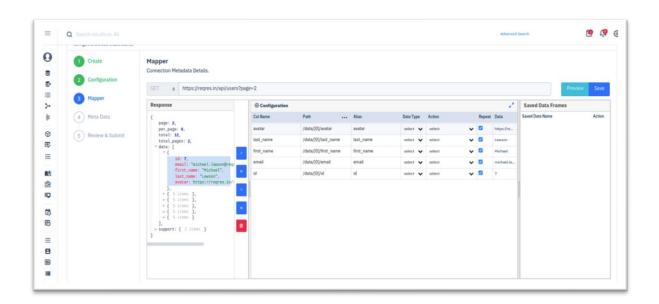
Select the pull or push method



Select the Auth Protocol



See below the response



Benchmarking with SAP OData Consumption

POD - Pods are **the smallest, most basic deployable machines or node created to run a single** instance of a job/ process in your cluster. Pods contain one or more containers, such as Docker containers.

For the benchmarking exercise below, we have created 1 Core x 4GB nodes on AWS for parallel workloads for Data Integration pipelines.

We have tested ODATA APIS for 3 scenarios

1. Single POD for migrating all data from the ODATA API

Process Start Time -25-07-2022 19:44:33 Process End Time - 25-07-2022 22:45:52 Total Time - 03:01:19

Start Time	End Time	Total Time	Total Records	POD Filter	Filter Column
25-07- 2022 19:44	25-07-2022 22:45	3:01:19	15,979,821	2019006 to 2021012	FISCPER

2. 3 PODs for migrating data year wise for year 2019-2022

Process Start Time - 25-07-2022 15:46:39 Process End Time - 25-07-2022 17:36:58 Total Time - 01:50:19

Start Time	End Time	Total Time	Total Records	POD Filter	Filter Column
25-07- 2022 15:49	25-07-2022 17:00	1:11:40	6,481,904	2020001 to 2020012	FISCPER
25-07- 2022 15:48	25-07-2022 15:50	0:01:56	116,831	2019006 to 2019012	FISCPER
25-07- 2022 15:48	25-07-2022 17:36	1:47:23	9,381,086	2021001 to 2021012	FISCPER
		Total Record	15,979,821		

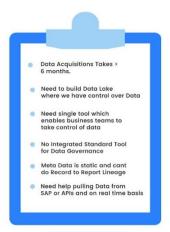
3. 10 PODs for migrating data in 3-month batch.

Process Start Time - 2022-07-25 17:07:22 Process End Time - 2022-07-25 18:04:15 Total Time - 00:56:53

Start Time	End Time	Total Time	Total Records	POD Filter	Filter Column
25-07-2022 17:09	25-07-2022 17:12	0:02:53	43,472	2019006 to 2019009	FISCPER
25-07-2022 17:09	25-07-2022 17:13	0:03:35	73,359	2019010 to 2019012	FISCPER
25-07-2022 17:09	25-07-2022 17:10	0:00:34	3,718	2020001 to 2020003	FISCPER
25-07-2022 17:09	25-07-2022 17:13	0:03:55	173,173	2020004 to 2020006	FISCPER
25-07-2022 17:09	25-07-2022 18:03	0:53:57	3,170,739	2020007 to 2020009	FISCPER
25-07-2022 17:09	25-07-2022 17:57	0:47:26	3,134,274	2020010 to 2020012	FISCPER
25-07-2022 17:09	25-07-2022 18:00	0:51:09	3,326,466	2021001 to 2021003	FISCPER
25-07-2022 17:09	25-07-2022 17:48	0:38:26	2,343,913	2021004 to 2021006	FISCPER
25-07-2022 17:09	25-07-2022 17:54	0:45:13	2,806,232	2021007 to 2021009	FISCPER
25-07-2022 17:09	25-07-2022 17:28	0:19:17	904,475	2021010 to 2021012	FISCPER
		Total Record	15,979,821		

Minimum time take to migrate all record was approx. 56 minutes using 10 PODs. This includes time to start each POD, which is approximately 1.5 minutes.

A trailblazing No code Data Platform.



Let us know how can we part of your exciting journey!

SciklQ provides a number of functionalities to perfectly augment your data strategy. For any further queries on how SciklQ can help you achieve your Data Management goals, please contact us

enquiry@scikiq.com



