O-Insights Reporting Engine

User Guide

Support E-mail: contact@conexaotechsolutions.com

v 4.8

Contents

About O-Insights Reporting Engine

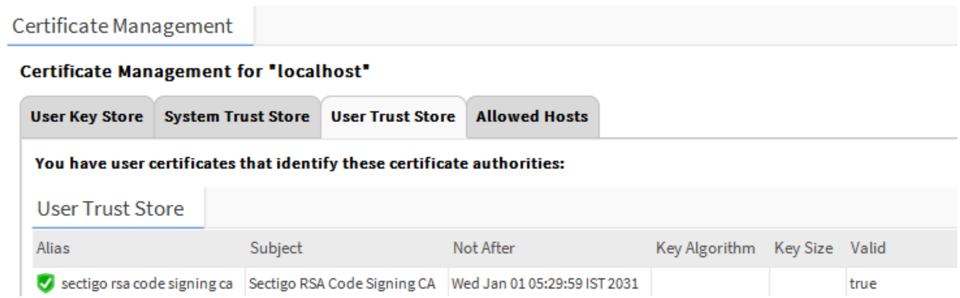
O-Insights Reporting Engine is a reporting engine designed to work natively with Tridium Niagara® that facilitates automated report generation of historical, alarm, analytics, audit trail data from Niagara.

Pre-Requisites

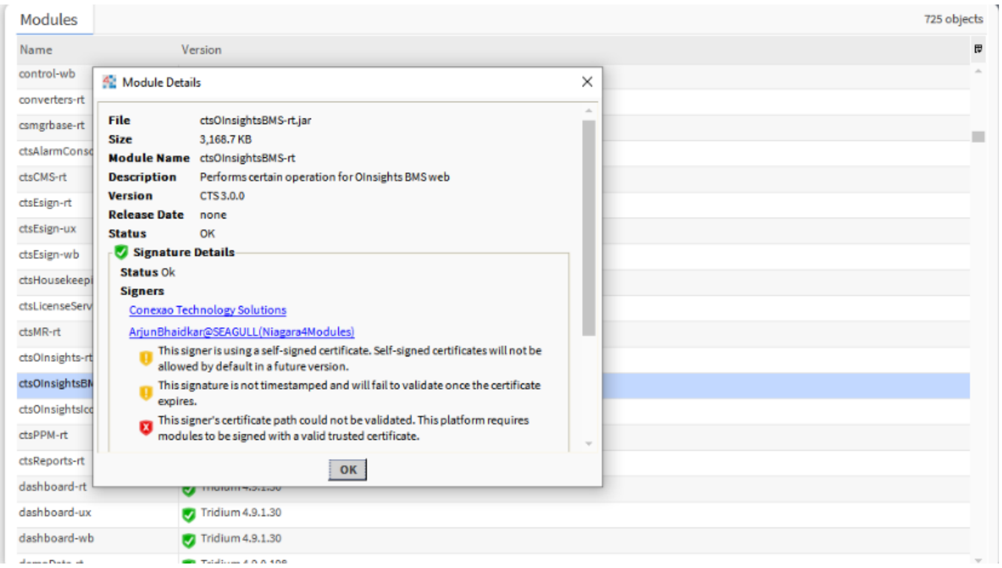
- **Niagara Workbench**, 4.6 or later.
- Works best in **Chrome** & **Edge.**
- **CTS Licensing Module:** CTS Licensing Module is required to license and run the O-Insights BMS module.
  - Copy the JAR files provided *ctsLicenseService* to the Niagara modules folder (typically C:\Niagara\Niagara-4.x\modules).
  - Restart the Niagara Workbench and the station.
  - In the Niagara Palette, click the folder button to open the plugin list, and from the list, filter and select *ctsLicenseService* and click *OK*.
  - Drag the *LicenseService* to the *Services* node from *Nav*.

CTS Licensing Module: Since Code Signing of Niagara Modules is mandatory in Niagara 4.9 or later, users are required to add a CA certificate for ensuring proper working of CTS Niagara Modules.

- Copy CA certificate to shared.
- Install Certificate to the User Trust store of **Workbench** and **Platform.**



- Restart Platform and WB
- In Module info the Shield of the CTS Modules should be green, as shown in the example below:



- Drop the module from the palette.

Setup (Niagara)

- Copy the JAR files provided (*ctsOInsightsBMS*, and *ctsOInsightsIcons*) to the Niagara modules folder (typically C:\Niagara\Niagara-4.x\modules).
- Copy the license file (.lic) to the shared folder of the station (typically C:\ProgramData\Niagara4.x\vykon\stations\StationName\shared).
- Restart the Niagara Workbench and the station.
- In the Niagara Palette, click the folder button to open the plugin list, and from the list, filter and select *ctsOInsightsBMS* and click *OK*. Repeat the same process with *ctsOInsightsIcons* (Icons Pack for the Dashboard).
- In the palette, the *ctsOInsightsBMS* plugin should open.
- Create a folder inside the *Config* from the Navigation tree.
- From the plugin opened in the palette, drag all the items to the folder created under *Config*.
- Restart the station. Now you should be able to access the Dashboard at *NiagaraServerIP/ctsOInsightsBMS/res/alarmDashboard.html* where *NiagaraServerIP* is the Server IP Address of the Niagara Server (configurable through Niagara WebConfig).

Reporting over SSL (Optional)

The O-Insights Reporting Engine facilitates the usage of SSL certificates if required. Once the custom SSL certificate is generated and added to the browser, follow the following steps to enable SSL support in Reporting Engine.

- Post generation of the certificate, open the QueryEngine.exe.config from C:\Program Files (x86)\Query Engine folder (or where the query engine is installed). Open the file in any text editor of choice, and in the *<add key="EnableSSL" value="0" />*, replace the *0* with *1.*
- Go to the shared folder of your Niagara station in which O-Insights Reporting is installed (typically: *C:\ProgramData\Niagara4.x\vykon\stations*\StationName*shared*) and edit the Query Engine Config.JSON file in any text editor. In *"PROTOCOL":"http"*, change it to *https.*
- Restart the station.

HTTP Header Providers (Niagara 4.10 or later)

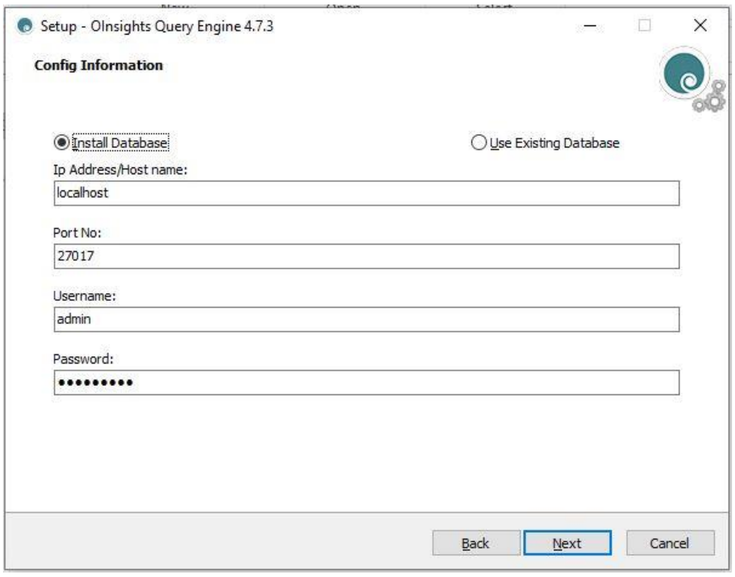
If the HTTP Header Providers option is enabled in Niagara, add the following part in bold to the *connect-src* field to make sure the module functions properly:

'self' workbench ws://%hostname%:%port% ***http://*:<port number>*** *wss://%hostname%:%port%* ***https://*:<port number>***

Where the <port number> should be replaced with the port number of the server and the http:// or https:// part can be used as per requirement. Alternatively, the * can be replaced with the specific IP address/host name of the machine.

Setup (Reporting Engine)

- Open the setup EXE file provided.
- Read the license agreement and click on *I accept the agreement,* and click on *Next* to proceed.

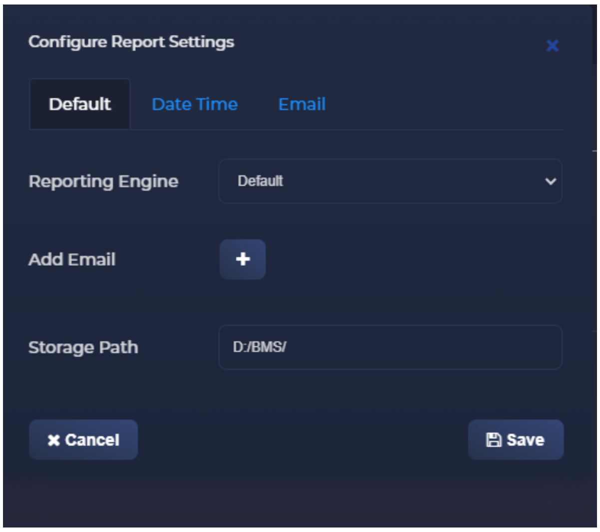


- If it is a fresh install, select *Install Database* and fill in the details, where:
    - *Ip Address/Host name:* IP address/host name on which the database is to be installed
    - *Port No:* Open port number for database
    - *Username* and *Password:* Username and password for the database. The default username is *admin* and password is provided. This can be changed, but the username/password has to be remembered in the unlikely event of needing to recover the database.
- If it is an update, select *Use Existing Database* and fill in the details of the existing database like above to connect to the existing database.
- Click *Next*, *Install* and once done, click on *Finish.*

Report Configuration

Report Configuration helps set configure the settings for the entire reporting engine like Engine type, Email settings, and Date Time Settings. This can be accessed by expanding the settings menu by clicking the arrow next to the username from the *Create Report* page.

General Settings



Configure Report Settings

Default Settings

- The *Add Email* option lets the user configure the mail address to send the generated reports. Click the + button to expand the email field and type the email address in the field and repeat the process until all the desired email IDs are added. Click the trash icon to delete an entry or the pen icon to edit an existing entry.
- The *Storage Path* field lets the user add the path of the local/remote storage where a copy of the generated report is to be stored.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

Date Time Settings

- The *Date Time* settings let the user configure the date-time format as per requirement.
- Enter the desired date format in the *Date Format* field with *ddMMyy* where *dd* denotes the date, MM the month, and yy the year.

- Enter the desired time format in the *Time Format* field with the *HH:mm* where *HH* denotes the hours and *mm* the minutes.
- If custom date time format is required for certain report types, users can use the *Report specific date-time* option. Click the + button to add a customized date-time format, in the type dropdown choose the desired report type and in the date and time fields, enter the date and time formats required for the report types respectively. Once done, click the save icon. An existing configuration can be modified by clicking the pen icon or deleted by clicking the trash icon.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

> **Note**: To get the desired date/time format, use the keys as described in this document.

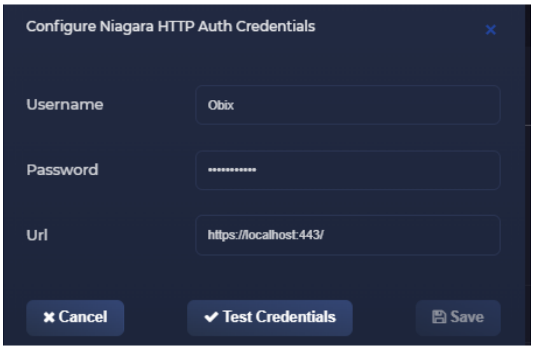
Email Settings

The *Email Settings* section lets the user configure the SMTP server for sending emails.

- *Sender Email:* Email ID by which the report(s) is to be sent.
- *Sender Password:* Password of the email ID
- *SMTP Server:* SMTP Server Address
- *SMTP Port:* Port of the SMTP Server
- *Security Protocol:* The protocol through which to connect to the SMTP Server, *Auto, SSL, TLS,* or *None* (No encryption).
- *Authenticate User*: Whether to authenticate the given user or not.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

Credential Settings

The *Credential Settings* helps configure the Obix user credentials to connect to Niagara, which is required to communicate with Niagara and fetch/write data to Niagara.



Configure Niagara HTTP Auth Credentials

- The Username field lets the user add the Obix username as configured in Niagara.
- The *Password* field lets the user add the password of the Obix user.
- The *Url* field is for adding the Niagara HTTP authentication URL, which is usually the same as the station's web URL.
- Test the credentials by clicking *Test Credentials*. If the credentials are successfully authenticated, then the settings can be saved.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

Reload Templates

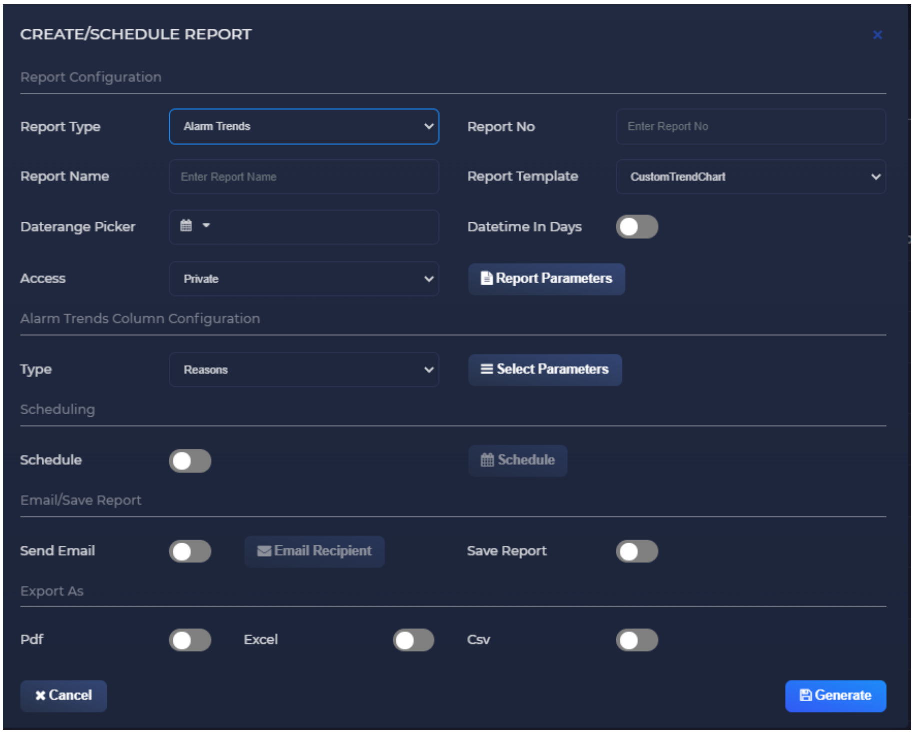
In case there has been a change in templates or new templates are added, click *Reload Templates* to clear the cache and reload the new/modified templates.

Creating/Scheduling Reports

The *Create Reports* option lets the user create, schedule, send mail, and/or generate pdf/excel/csv copy in storage various reports of their preference. The various reports can be selected by switching between the *Report Type* options. To close the popup without saving changes, click the Cancel button or click the Generate button to generate and save the report.

Alarm Report

The Alarm Report type generates reports based on Niagara Alarm histories.



Create/Schedule Alarm Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated. Default is *DefaultAlarm*.

- The *Daterange Picker* lets the user select the duration of alarm records, based on which the report will be generated. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the *Custom Range* option and select the start date/time in the first calendar and the end date in the calendar box.
- If records are to be selected dynamically with respect to the current date, toggle on *Datetime in days* and fill in the *From* and *To* ranges where *days* are relative to the present day. For instance, if records from the 7th previous day to the present day to the 4th previous day to the present day are to be considered, put *From days* as 7 and *For days* as 4, along with the start and end time respectively.
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.
- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save*.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

Alarm Column Configuration

- The *Select Parameters* button triggers the *Configure Alarm Column* popup, where the users can select all the alarm parameters that are required by switching the toggle on. In the *Display Name* field next to the selected parameters, add the name to be displayed in the report for the selected parameter.

    - To add a custom metadata column, click the *Add New Parameter* and add the metadata name in the *Column Name* field, and display name in the *Display Name* field.
    - The *allNotes* parameter, if toggled on, adds all notes added for the alarm. If toggled off, then only the most recent note will be displayed in the report.

- Once the parameters are selected, the sort dropdowns will show up below. From the dropdown, select the column to sort the table by from the *Sort By* dropdown and select whether to sort in ascending or descending order from the *Sort Order* dropdown.
- The *Filter* option lets the user filter the alarm list by *Tag, Source, Source State, Alarm Class, Priority, User,* and *Duration.* Type the filter input in required fields in the Filter Results popup post clicking the *Filter* button, and click *Apply Filter.* All fields except *Tags* can take wildcards, where multiple keywords can be entered, separated by a comma, which will show all the results matching each of the keywords based on the filter. Click *Cancel* to close the *Filter Results* without saving the filters.
    - To add a custom metadata-based filter, add the metadata name in the first field and value in the second field. Click the *Add New Filter* to add another field or remove to remove an existing entry.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate a report for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.

- *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use *The nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
- *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use *The nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
  - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
  - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
  - To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data.*
  - Click *Save* to save the configuration or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

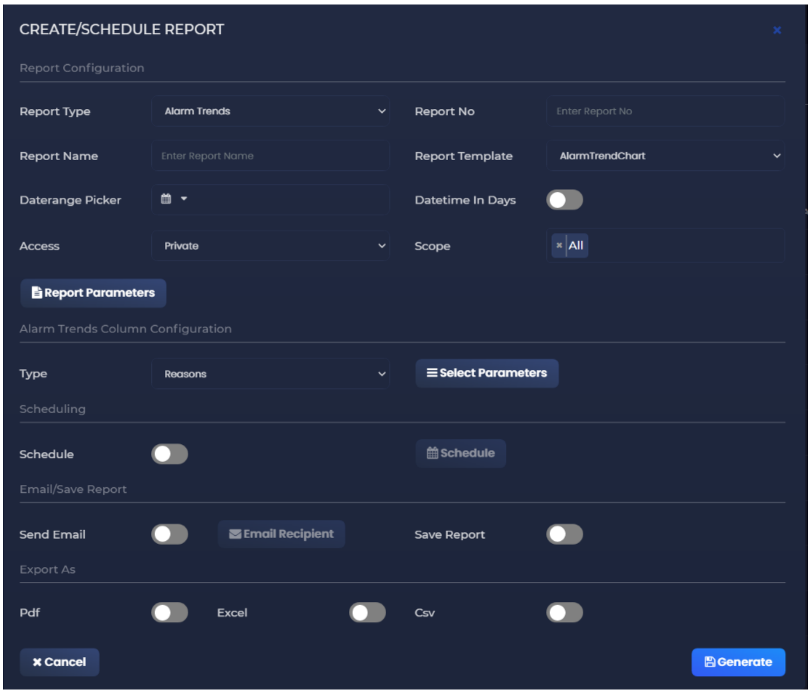
- The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Alarm Trends Report

The Alarm Trends Report type generates reports based on Niagara Alarm histories.



Create/Schedule Alarm Trends Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated. Default is *DefaultAlarmTrends.*
- The *Daterange Picker* lets the user select the duration of alarm records, based on which the report will be generated. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the *Custom Range* option and select the start date/time in the first calendar and the end date in the calendar box.

- If records are to be selected dynamically with respect to the current date, toggle on *Datetime in days* and fill in the *From* and *To* ranges where *days* are relative to the present day. For instance, if records from the 7th previous day to the present day to the 4th previous day to the present day are to be considered, put *From days* as 7 and *For days* as 4, along with the start and end time respectively.
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save*.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

Alarm Trends Column Configuration

- From the *Type* dropdown, select the desired type and click the *Select Parameters* button, which triggers the *Select Parameters* popup.
- Once the parameters are selected, the sort dropdowns will show up below. From the dropdown, select the column to sort the table by from the *Sort By* dropdown and select whether to sort in ascending or descending order from the *Sort Order* dropdown.

Alarm Trends by Reason

- If alarm trends are to be grouped by reason, select the *Reason* dropdown, and click *Select Parameters.*
- For filtering alarm records by a particular source name or part of a source name, enter the desired text in the *Pattern* field.
- To add a reason, type the reason name in the *Reason* field and the name of the reason column header to be shown in the *Display Name* field and click the + icon. Repeat the process until all the required reasons are added. Click the trash icon to delete an entry or the pen icon to edit an existing entry.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

Alarm Trends by Point

- If alarm trends are to be grouped by reason, select the *Point* dropdown, and click *Select Parameters.*
- For selecting Alarm trend records by point name, select the *Pattern* option from the dropdown and in the *Search Parameters* field, add the point name or part of the point name, and the name to be displayed in the *Display Name* field and click the + icon. Repeat the process until all the required points are added. Click the trash icon to delete an entry or the pen icon to edit an existing entry.
- For selecting Alarm trend records by tag, select the *Tag* option from the dropdown and in the *Search Parameters* field, add the tag name, and the name to be displayed in the *Display Name* field, and click the + icon. Repeat the process until all the required tags are added. Click the trash icon to delete an entry or the pen icon to edit an existing entry.
- For selecting Alarm trend records by highest/lowest values, select the *Point* option from the dropdown and in *Select* dropdown, select top or bottom to get the maximum or minimum values, respectively. In the number dropdown, select the number of records to be considered. Click the pen icon to edit the *Display name* if required.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

Alarm Trends by Class

- If alarm trends are to be grouped by Alarm Class, select the *Alarm Class* dropdown, and click *Select Parameters.*
- For selecting Alarm trend records by Alarm Class, enter the alarm class in the *Alarm Class* field, the name to be displayed for the class in the *Display Name field, and* click the + icon. Repeat the process until all the required tags are added. Click the trash icon to delete an entry or the pen icon to edit an existing entry.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

Alarm Trends by Asset

- If alarm trends are to be grouped by Assets, similar to Asset Report, select the *Alarm Class* dropdown, and click *Select Parameters.*
- The *Add Parameter* button lets the user add a parameter with

    - *Parameter Name:* Parameter name which will be the column header
    - *Search Type:* Search type for filtering the alarms, this can be *name* or *tags*.
    - *Duration:* Duration of the alarms based on which the records will be considered
- Once Parameters are added, click *Add Asset* to add assets, enter the desired name and next to the parameter name, enter the search term for filtering the records (or tag name if tag is chosen in *Search Type).*
- Filters can be chosen by clicking *Filter* button.
    - To add a custom metadata-based filter, add the metadata name in the first field and value in the second field. Click the *Add New Filter* to add another field or remove to remove an existing entry.
- Once done, click *Save* to save or *Cancel* to cancel.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute.
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.
    - *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use *The nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

- *Yearly*: For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
    - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
    - To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data*.
    - Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

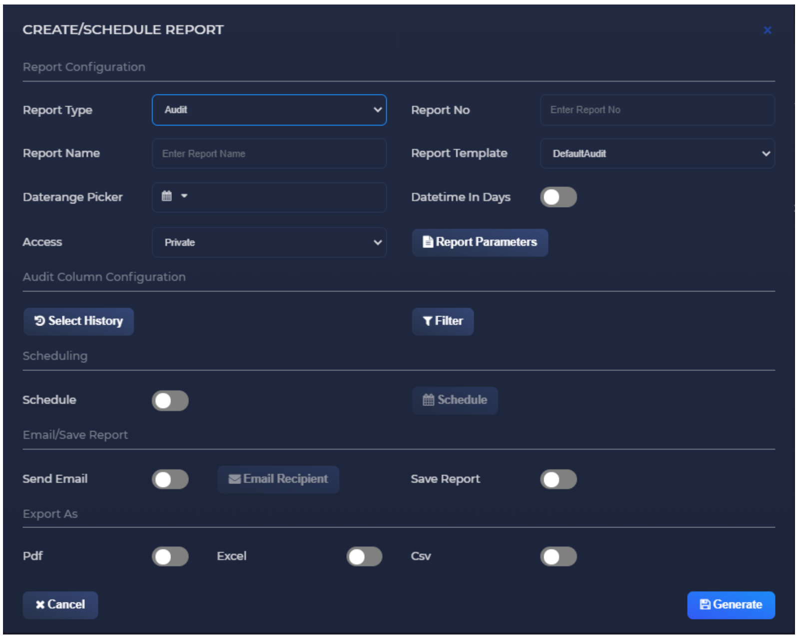
- The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Audit Report

The Audit Report type generates reports based on Niagara Audit histories.



Create/Schedule Audit Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated. Default is *DefaultAudit.*
- The *Daterange Picker* lets the user select the duration of alarm records, based on which the report will be generated. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the *Custom Range* option and select the start date/time in the first calendar and the end date in the calendar box.

- If records are to be selected dynamically with respect to the current date, toggle on *Datetime in days* and fill in the *From* and *To* ranges where *days* are relative to the present day. For instance, if records from the 7th previous day to the present day to the 4th previous day to the present day are to be considered, put *From days* as 7 and *For days* as 4, along with the start and end time respectively.
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.
- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save*.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

Audit History Configuration

- The *Select History* button triggers the *Select Audit Histories* popup, where the users can select all the audit history parameters that are required by switching the toggle on. In the *Display Name* field next to the selected parameters, add the name to be displayed in the report for the selected parameter.
- The *Select Audit Histories* text box lets the user select all the audit histories available in Niagara, where clicking an audit history adds it to the list and clicking the *x* icon next to the history name removes an added history.
- Once the histories are selected, the sort dropdowns will show up below. From the dropdown, select the column to sort the table by from the *Sort By* dropdown and select whether to sort in ascending or descending order from the *Sort Order* dropdown.

- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
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- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process

    until all the users are added. Click the trash icon to remove an added user.
  - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
  - To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data*.
  - Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

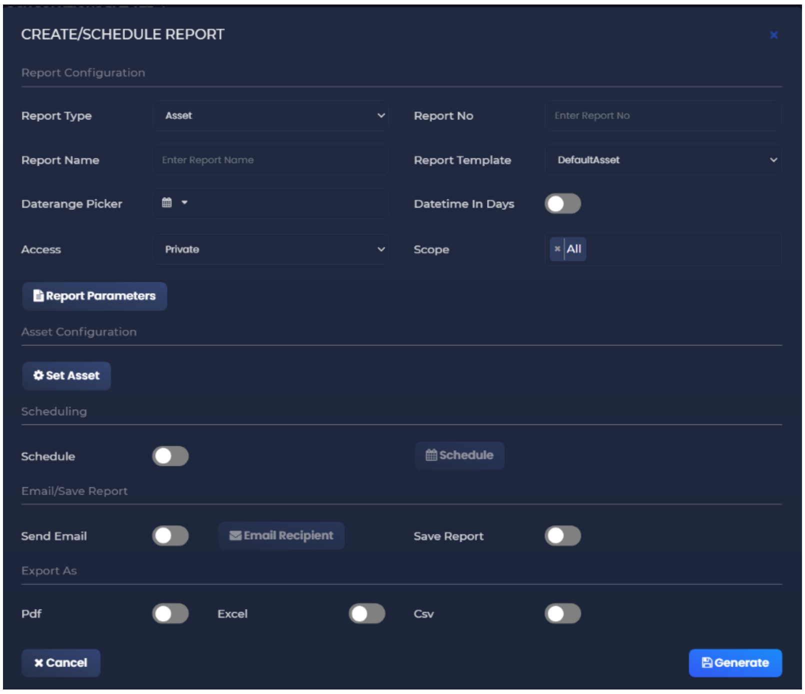
- The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Asset Report

The Asset report type generates reports for Assets.



Create/Schedule Asset Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated.
- The *Daterange Picker* lets the user select the duration of alarm records, based on which the report will be generated. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the

Custom Range option and select the start date/time in the first calendar and the end date in the calendar box.

- If records are to be selected dynamically with respect to the current date, toggle on *Datetime in days* and fill in the *From* and *To* ranges where *days* are relative to the present day. For instance, if records from the 7th previous day to the present day to the 4th previous day to the present day are to be considered, put *From days* as 7 and *For days* as 4, along with the start and end time respectively.
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.
- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save.*
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

Asset Configuration

- The *Set Asset* button triggers the *Select Histories* popup, where the users can select histories for the desired point(s).
- The *Add Parameter* button lets the user add a parameter with *Parameter Name, Time Interval, Roll up, Aggregation.*
- Once Parameters are added, click *Add Asset* to add assets, and choose the points for added parameters.
- Once done, click *Save* to save or *Cancel* to cancel.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.

- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.
    - *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
    - *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
    - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.

- To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data.*
- Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

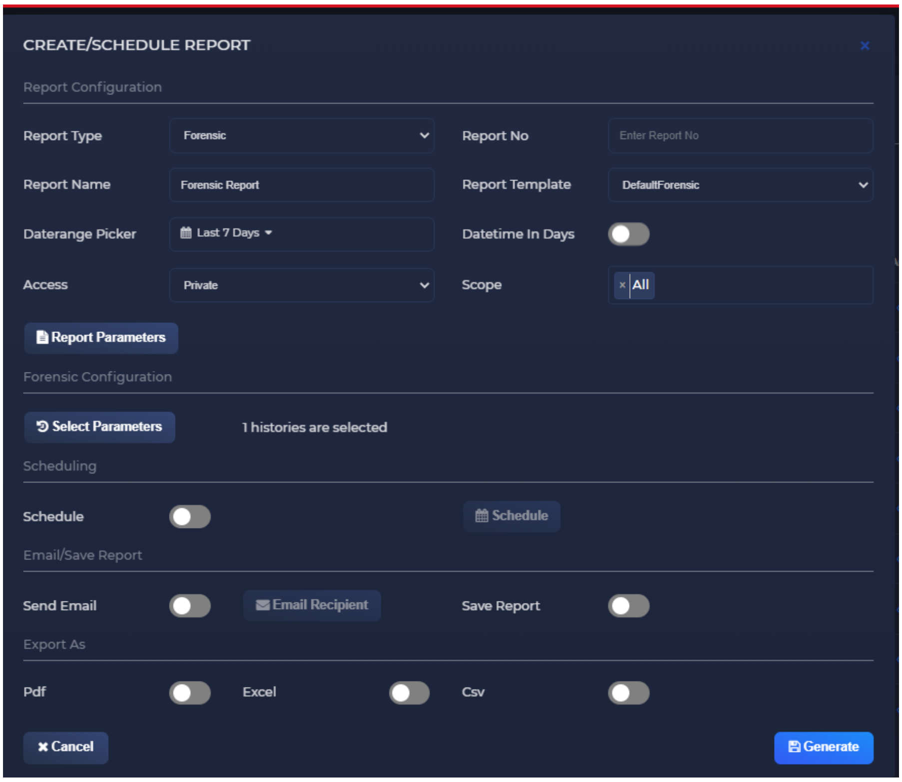
- The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Forensic Report

The Forensic report type generates Forensic Reports for points for fault detection and diagnostics, as configured by the user.



Create/Schedule Forensic Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated.
- The *Daterange Picker* lets the user select the duration of alarm records, based on which the report will be generated. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the

Custom Range option and select the start date/time in the first calendar and the end date in the calendar box.

- If records are to be selected dynamically with respect to the current date, toggle on *Datetime in days* and fill in the *From* and *To* ranges where *days* are relative to the present day. For instance, if records from the 7th previous day to the present day to the 4th previous day to the present day are to be considered, put *From days* as 7 and *For days* as 4, along with the start and end time respectively.
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.
- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save*.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

Forensic Configuration

- The *Select Parameter* button triggers the *Configure Forensic Report* popup, where the users can select histories for the desired point(s).
- From the dropdown, select the desired history and click *Add*. Repeat the process until all the desired histories are added.
- Once added, expand the history by click the triangle at the beginning of the row and choose all the required parameters on.
- Toggle on the *Combine* option to combine all the numeric histories together in a single table. If toggled is set to off, each history will be rendered as separate tables.
- To delete an added history, click the trash icon next to the history.
- Once done, click *Save* to save or *Cancel* to cancel.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.
    - *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
    - *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
    - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email

address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
- To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data.*
- Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

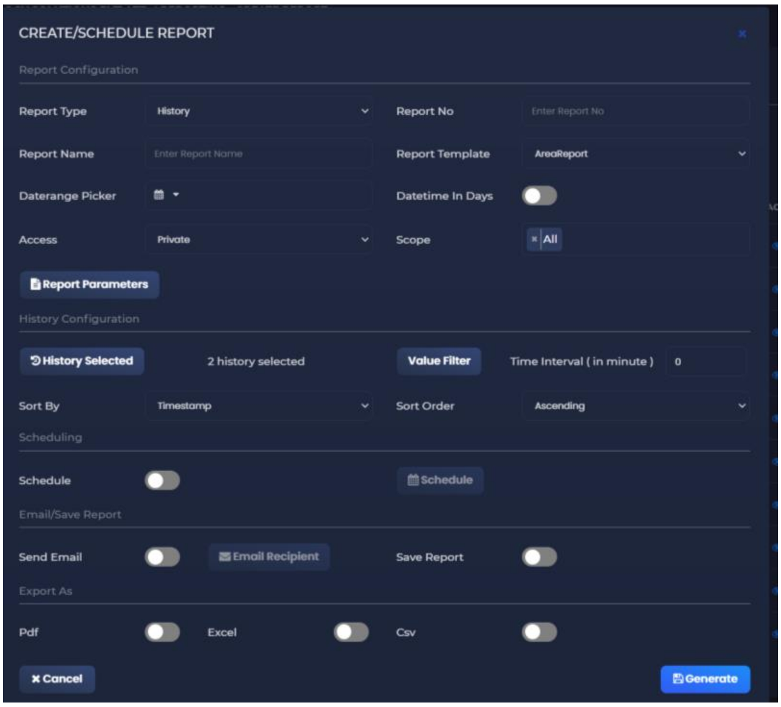
- The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

History Report

The History report type generates the Niagara History report for the selected points.



Create/Schedule History Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated. Two default report types are provided, where the *DefaultHistory* generates a tabular history report and *DefaultHistoryandChart* generates a tabular history report along with a chart plotted for the same.
- The *Daterange Picker* lets the user select the duration of alarm records, based on which the report will be generated. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the *Custom Range* option and select the start date/time in the first calendar and the end date in the calendar box.

- If records are to be selected dynamically with respect to the current date, toggle on *Datetime in days* and fill in the *From* and *To* ranges where *days* are relative to the present day. For instance, if records from the 7th previous day to the present day to the 4th previous day to the present day are to be considered, put *From days* as 7 and *For days* as 4, along with the start and end time respectively.
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

History Configuration

- The *Select History* button triggers the *Select Histories* popup, where the users can select histories for the desired point(s).
- The time interval between the reports that are to be considered can be specified in the *Time Interval* field (in minutes). Leave it blank to consider all the records.
- From the *History* drop down, select the required histories which are to be considered for the report, and in the *Display Name* field, add the name to be displayed for the column and click the + icon. Repeat the process until all the required histories are added. Click the trash icon to delete an entry or the pen icon to edit an existing entry.
- Once the histories are selected, the sort dropdowns will show up below. From the dropdown, select the column to sort the table by from the *Sort By* dropdown and select whether to sort in ascending or descending order from the *Sort Order* dropdown.
- To filter the report by values or value ranges, choose *Value Filter*. In the resulting popup, select the desired history or choose *All* for all, make use of the > >=, <<= buttons and the fields next to them to define ranges, and only value within that range will be shown in the report. For instance, if values less than or equal to 30 and greater than 20 is to be filtered, select > button and type 20 in the top field, and <= and 30 in the bottom field. Repeat till all the filters for histories are added.

- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.
    - *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
    - *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process

until all the users are added. Click the trash icon to remove an added user.

- To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
- To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data*.
- Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

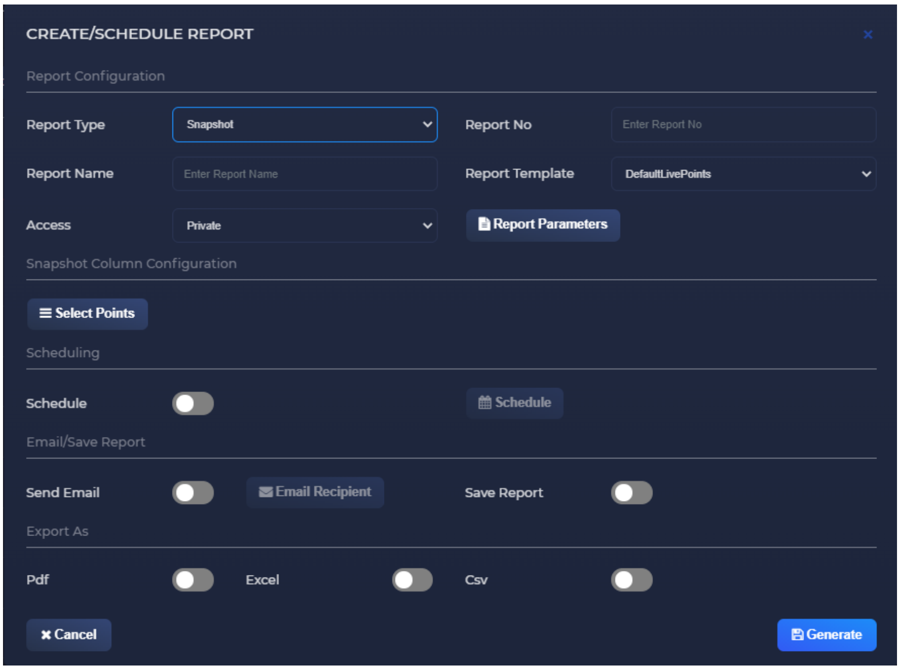
- The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Snapshot Report

The Snapshot report generates reports based on the current value(s) of the selected point(s).



Create/Schedule Snapshot Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated. Default is *DefaultLivePoints.*
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.

- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save*.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

Snapshot Report Configuration

- The *Select Points* button triggers the *Select Points* popup, where the users can select the desired points.
- From the *Point* dropdown, select the required points which are to be selected for the report, and in the *Display Name* field, add the name to be displayed for the row and click the + icon. Repeat the process until all the required points are added. Click the trash icon to delete an entry or the pen icon to edit an existing entry.
- Once the points are selected, the sort dropdowns will show up below. From the dropdown, select the column to sort the table by from the *Sort By* dropdown and select whether to sort in ascending or descending order from the *Sort Order* dropdown.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.

        - *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
        - *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
    - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
    - To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data.*
    - Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

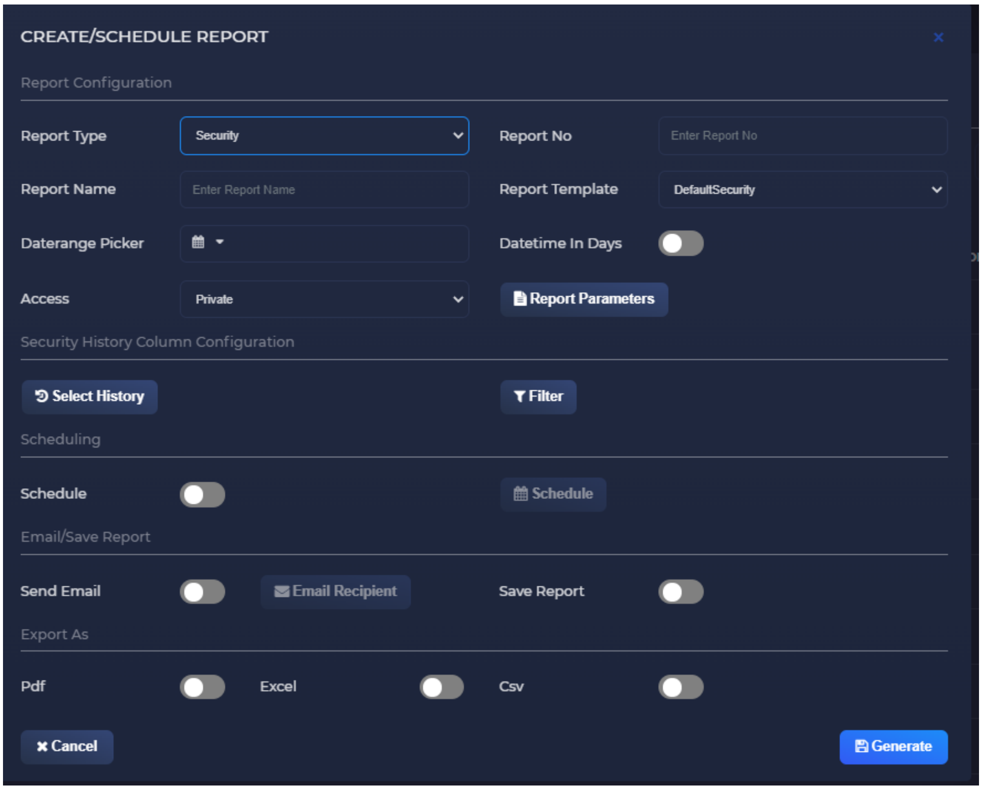
The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Security Report

The Security report generates security report based on Niagara Security History.



Create/Schedule Security Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated. Default is *DefaultSecurity.*
- The *Daterange Picker* lets the user select the duration of alarm records, based on which the report will be generated. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the

Custom Range option and select the start date/time in the first calendar and the end date in the calendar box.

- If records are to be selected dynamically with respect to the current date, toggle on *Datetime in days* and fill in the *From* and *To* ranges where *days* are relative to the present day. For instance, if records from the 7th previous day to the present day to the 4th previous day to the present day are to be considered, put *From days* as 7 and *For days* as 4, along with the start and end time respectively.
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.
- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save*.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

Security Report Configuration

- The *Select History* button triggers the *Select Security Histories* popup, where the users can select all the security history parameters that are required by switching the toggle on. In the *Display Name* field next to the selected parameters, add the name to be displayed in the report for the selected parameter.
- The *Select Security Histories* text box lets the user select all the audit histories available in Niagara, where clicking an audit history adds it to the list and clicking the *x* icon next to the history name removes an added history.
- Once the histories are selected, the sort dropdowns will show up below. From the dropdown, select the column to sort the table by from

the *Sort By* dropdown and select whether to sort in ascending or descending order from the *Sort Order* dropdown.

- Once the histories are selected, the sort dropdowns will show up below. From the dropdown, select the column to sort the table by from the *Sort By* dropdown and select whether to sort in ascending or descending order from the *Sort Order* dropdown.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.
- The *Filter* option lets the user filter the alarm list by *Operation* and *User*, where the user can add operation and user name and select *Include* or *Exclude* to either include or exclude data based on the chosen filter(s). Once done, click *Apply Filter* to apply the filters or click *Cancel* to close the *Filter Results* without saving the filters.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.
    - *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
    - *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
    - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
    - To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data.*
    - Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

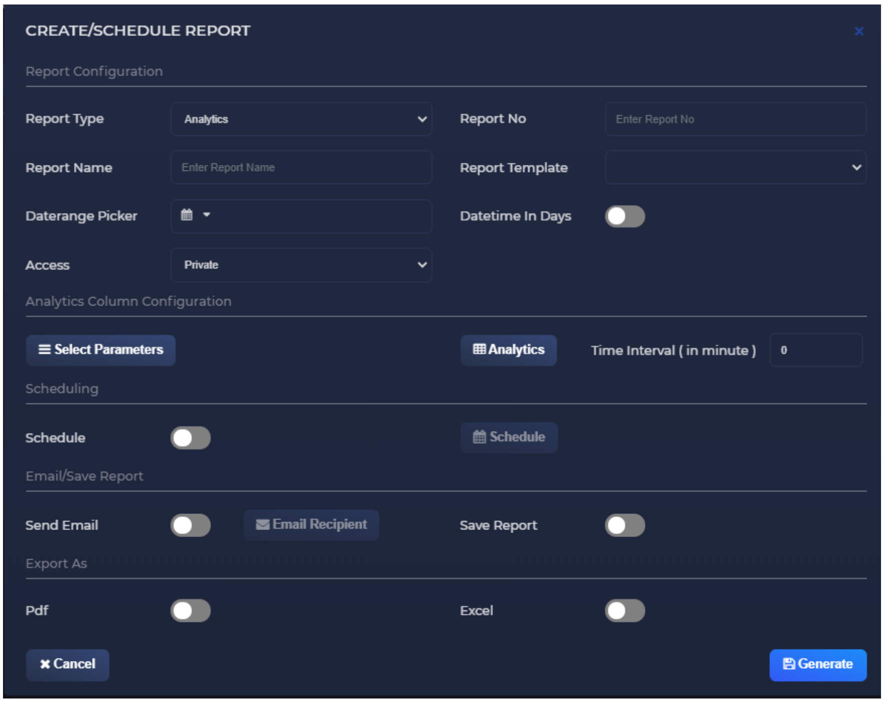
- The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Analytics Report

The Analytics report type generates an analytic report for the selected points, where points values can be aggregated based on selected criteria for insights.



Create/Schedule Analytics Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated. Default is *DefaultAnalytics.*
- The *Daterange Picker* lets the user select the duration of alarm records, based on which the report will be generated. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the

Custom Range option and select the start date/time in the first calendar and the end date in the calendar box.

- If records are to be selected dynamically with respect to the current date, toggle on *Datetime in days* and fill in the *From* and *To* ranges where *days* are relative to the present day. For instance, if records from the 7th previous day to the present day to the 4th previous day to the present day are to be considered, put *From days* as 7 and *For days* as 4, along with the start and end time respectively.
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

Analytics Configuration

- The *Select Histories* button triggers the *Select Histories* popup, where the users can add the histories for points on which analytic operations are to be performed.
    - From the History dropdown, select the required history on which analytic operations are to be performed, and in the Display Name field, add the name to be displayed for the row and click the + icon. Repeat the process until all the required histories are added. Click the trash icon to delete an entry or the pen icon to edit an existing entry.
    - To close the popup without saving changes, click the Cancel button or click the Save button to save changes.
- *Time Interval* field lets the user specify the time interval between records in minutes. All the records within the specified interval will be rolled up.
- The *Analytics* button enables performing analytics on the selected histories.
    - The *Rollup* option is for performing the selected operation on the records between intervals for the selected historical records.

- *Sum*: Sum of all the records within the chosen *Time Interval*.
- *Difference:* Difference between the first and last records within the chosen *Time Interval*.
- *Max:* The highest recorded value within the chosen *Time Interval*.
- *Min:* The lowest recorded value within the chosen *Time Interval*.
- *Avg:* The average of all the records within the chosen *Time Interval*.

▪ The *Single Point Aggregation* option lets the user aggregate all the records for a single point as a column at the bottom and the *Multi Point Aggregation* aggregates different points of the same timestamp based on the aggregation type. Aggregation types are similar to rollup operations mentioned above, the values will be aggregated as a single value based on the operation chosen.

▪ The *Missing Data Strategy* lets the user use missing data strategies like *K-Nearest Neighbour* and *Linear Interpolation* to fill in the missing data.

▪ *Add Aggregate Table* toggle renders the aggregated analytics table as a separate table.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.

  - *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
  - *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
  - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
  - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
  - To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data.*
  - Click *Save* to save the configuration, or *Cancel* to discard without saving changes

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Email/Save Reports

- To send an email to the preconfigured email address, toggle the *Send Email* toggle on.
- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

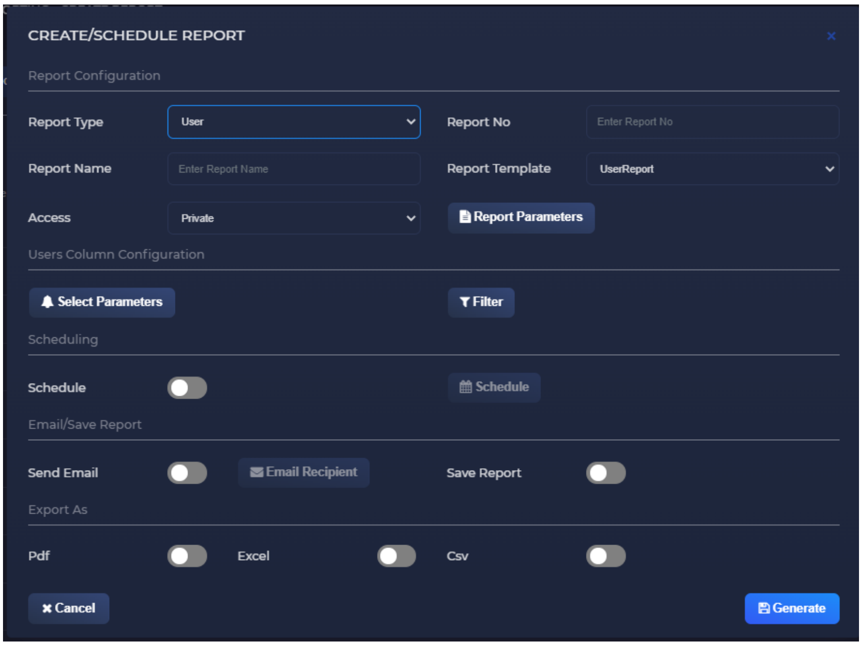
- The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

User Report

The User Report type generates reports based on the users and user properties from Niagara.



Create/Schedule Audit Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated. Default is *UserReport.*
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.

- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save*.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

User Parameter Configuration

- The *Select Parameters* button triggers the *Select User Parameters* popup, where the users can select all the user parameters that are required by switching the toggle on. This typically involves any properties for a user available in Niagara (except password). In the *Display Name* field next to the selected parameters, add the name to be displayed in the report for the selected parameter.
- Once the parameters are selected, the sort dropdowns will show up below. From the dropdown, select the column to sort the table by from the *Sort By* dropdown and select whether to sort in ascending or descending order from the *Sort Order* dropdown.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.
- To filter user reports by authentication modes, choose the *Filter* option and in the popup, choose the authentication mode by which to filter the report data.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.

- *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.
- *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
- *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
    - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
    - To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data.*
    - Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

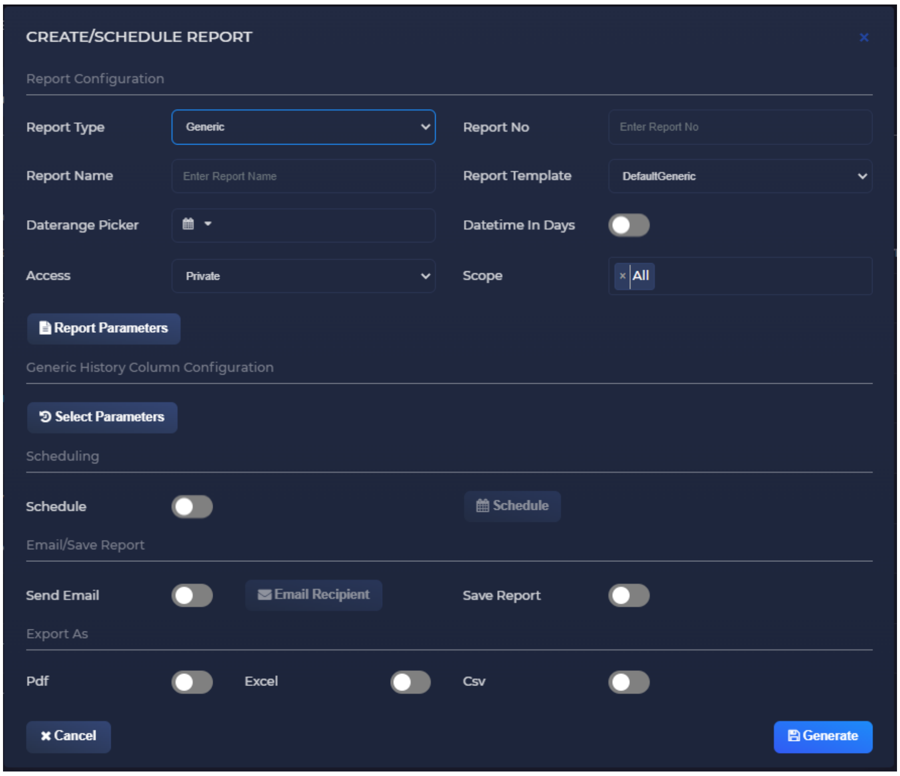
The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Generic Report

The Generic Report lets the user create customized generic report, where the user can create customized columns and map it to chosen parameters of the chosen histories.



Create/Schedule Generic Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated.
- The *Daterange Picker* lets the user select the duration of alarm records, based on which the report will be generated. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the

Custom Range option and select the start date/time in the first calendar and the end date in the calendar box.

- If records are to be selected dynamically with respect to the current date, toggle on *Datetime in days* and fill in the *From* and *To* ranges where *days* are relative to the present day. For instance, if records from the 7th previous day to the present day to the 4th previous day to the present day are to be considered, put *From days* as 7 and *For days* as 4, along with the start and end time respectively.
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).
- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save*.

Generic History Column Configuration

- The *Select Parameter* button triggers the *Select Generic History* popup, where the users can select histories for the desired point(s).
- In the Parameters, add all the column headers as per requirement.
- From the dropdown, select the desired history and click *Add*. Repeat the process until all the desired histories are added.
- Once added, expand the history by click the triangle at the beginning of the row and map the required parameters of the history to the column.
- To delete an added history, click the trash icon next to the history.
- Once done, click *Save* to save or *Cancel* to cancel.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.
    - *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
    - *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
    - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email

address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
    - To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data.*
    - Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

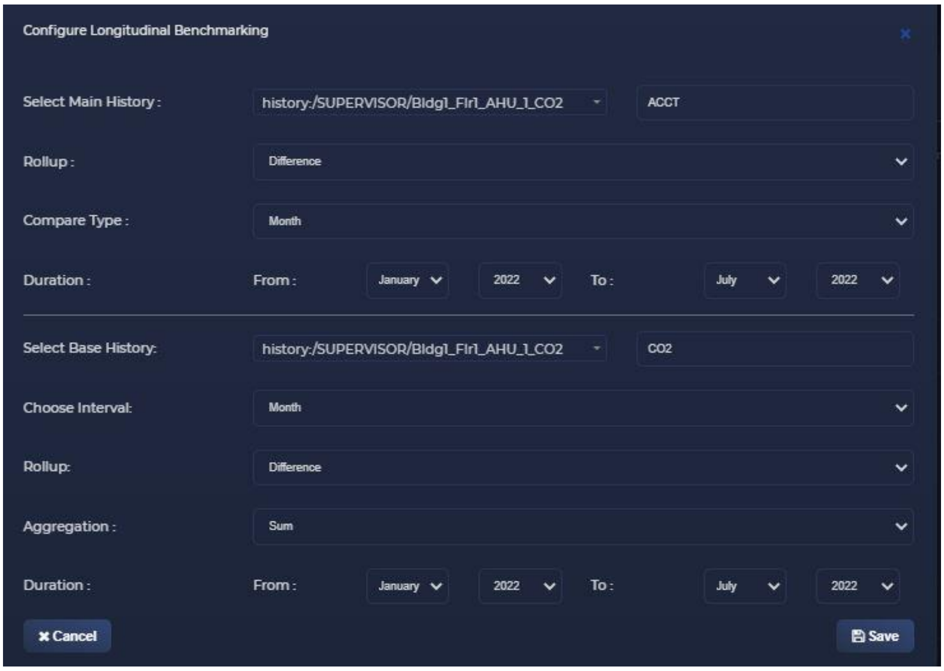
- The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Longitudinal Benchmarking Report

The *Longitudinal Benchmarking Report* lets users create longitudinal benchmark comparisons. This compares data of a history with a chosen interval to a baseline value that's achieved by rolling up and aggregating a baseline history.



Configure Longitudinal Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated. Default is *DefaultLongitudinalBenchmarking.*
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.

- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save*.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

Longitudinal Benchmark Report Configuration

- The *Configure* button triggers the *Configure Longitudinal Benchmarking* popup, where the users can configure longitudinal benchmarking.
- The *Select Main History* dropdown lets the user choose the main history. In the adjacent field, add the display name for the point.
- The *Rollup* option is for performing the selected operation on the records between intervals for the main history.
  - *Sum*: Sum of all the records within the chosen *Time Interval*.
  - *Difference:* Difference between the first and last records within the chosen *Time Interval*.
  - *Max:* The highest recorded value within the chosen *Time Interval*.
  - *Min:* The lowest recorded value within the chosen *Time Interval*.
  - *Avg:* The average of all the records within the chosen *Time Interval*.
- To select the frequency of the data, choose *Week, Month,* or *Year* from the *Compare Type* dropdown.
- Choose the duration as required from the *Duration* dropdowns/fields.

- *Select Base History* lets the user choose the base value from the base history with which the *Main History* will be compared.
- To select the frequency of the data, choose *Week, Month,* or *Year* from the *Compare Type* dropdown.

- The *Rollup* option is for performing the selected operation on the records between intervals for the main history.
    - *Sum*: Sum of all the records within the chosen *Time Interval*.
    - *Difference:* Difference between the first and last records within the chosen *Time Interval*.
    - *Max:* The highest recorded value within the chosen *Time Interval*.
    - *Min:* The lowest recorded value within the chosen *Time Interval*.
    - *Avg:* The average of all the records within the chosen *Time Interval*.
- Similarly, *Aggregation option* is for aggregating all the rolled-up values together to a single value for creating a base value.
- Choose the duration as required from the *Duration* dropdowns/fields.
- To close the popup without saving changes, click the *Cancel* button or click the *Save* button to save changes.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.
    - *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

    - *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the + button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
    - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the + button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
    - To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data.*
    - Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

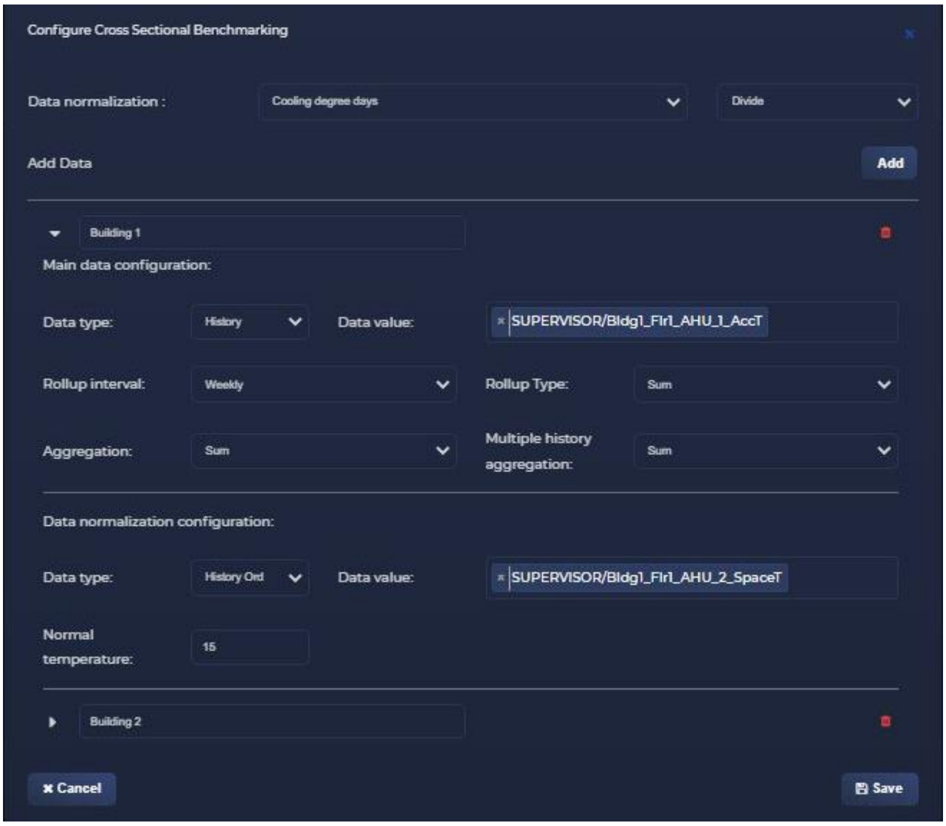
The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Cross Sectional Benchmarking Report

The *Cross Sectional Benchmarking Report* facilitates the creation of the cross-sectional benchmarking report, where buildings/rooms/facilities etc. can be compared against a normalized value.



Configure Cross Sectional Benchmarking Report

Report Configuration

- The *Reporting No* field lets the user add the Report Number if needed.
- The *Report Name* option lets the user configure the report name, which should be unique.
- Select the desired report template from the *Report Template* dropdown, based on which the reports will be generated. Default is *DefaultCrossSectionalBenchmarking*..
- The *Access* option lets the user restrict everyone else from accessing the report or lets anyone access the report. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and

generate reports, along with modifying the daterange of the report.

- *Report Parameters* option lets the user add Keys and Parameters based on which the histories will be filtered. Add the key in the *Key* field, value in the *Value* field, and once done adding all the required keys and values, click *Save*.
- The *Scope* lists all the departments available in the dropdown, and if chosen, the report will be only accessible to the users of the chosen department(s).

Cross Sectional Benchmarking Report Configuration

- The *Configure* button triggers the *Configure* popup, where the users can configure cross sectional benchmarking.
- Choose the method to normalize the data with *Data Normalization* dropdown – where data can be normalized with *Cooling Degree Days, Heating Degree Days, Number of Occupants,* or *Area*. Once chosen, select the operation with which normalization is done, *Divide* or *Multiply*. In most cases, it can be left as *Divide*. Click *Add* to add data points and keep repeating until all the required data points are added.

Cooling Degree Days

The cooling degree days option lets the users normalize the energy data based on number of cooling degree days.

- The *Data type* dropdown lets the user configure the data type. This can be either a history or a tag. Once selected, either add history in *Data value* field or add a tag.
- The *Rollup Interval* option is to choose the intervals at which data will be rolled up.
- The *Rollup Type* option is for performing the selected operation on the records between intervals for the main data history.
    - *Sum*: Sum of all the records within the chosen *Time Interval*.
    - *Difference:* Difference between the first and last records within the chosen *Time Interval*.

        - *Max:* The highest recorded value within the chosen *Time Interval*.
        - *Min:* The lowest recorded value within the chosen *Time Interval*.
        - *Avg:* The average of all the records within the chosen *Time Interval*.
- Similarly, *Aggregation option* is for aggregating all the rolled-up values together to a single value.
- *The Multiple history aggregation* aggregates different points of the same timestamp based on the aggregation type.

The *Data normalization configuration* section has all the configurations concerning normalization data.

- The *Data type* dropdown lets the user configure the data type. This can be either a history or a tag. Once selected, either add history in *Data value* field or add a tag.
- *Normal Temperature* is the ambient temperature that is considered to be normal.

Heating Degree Days

The heating degree days option lets the users normalize the data based on the number of heating degree days.

- The *Data type* dropdown lets the user configure the data type. This can be either a history or a tag. Once selected, either add history in *Data value* field or add a tag.
- The *Rollup Interval* option is to choose the intervals at which data will be rolled up.
- The *Rollup Type* option is for performing the selected operation on the records between intervals for the main data history.
        - *Sum*: Sum of all the records within the chosen *Time Interval*.
        - *Difference:* Difference between the first and last records within the chosen *Time Interval*.
        - *Max:* The highest recorded value within the chosen *Time Interval*.

- *Min:* The lowest recorded value within the chosen *Time Interval*.
- *Avg:* The average of all the records within the chosen *Time Interval*.

- Similarly, *Aggregation option* is for aggregating all the rolled-up values together to a single value.
- *The Multiple history aggregation* aggregates different points' final aggregated values.

The *Data normalization configuration* section has all the configurations concerning normalization data.

- The *Data type* dropdown lets the user configure the data type. This can be either a history or a tag. Once selected, either add history in *Data value* field or add a tag.
- *Normal Temperature* is the ambient temperature that is considered to be normal.

Number of Occupants

The number of occupants option lets the users normalize the data based on occupancy.

- The *Data type* dropdown lets the user configure the data type. This can be either a history or a tag. Once selected, either add history in *Data value* field or add a tag.
- The *Rollup Interval* option is to choose the intervals at which data will be rolled up.
- The *Rollup Type* option is for performing the selected operation on the records between intervals for the main data history.
    - *Sum*: Sum of all the records within the chosen *Time Interval*.
    - *Difference:* Difference between the first and last records within the chosen *Time Interval*.
    - *Max:* The highest recorded value within the chosen *Time Interval*.
    - *Min:* The lowest recorded value within the chosen *Time Interval*.

        - *Avg:* The average of all the records within the chosen *Time Interval*.
- Similarly, *Aggregation option* is for aggregating all the rolled-up values together to a single value.
- *The Multiple history aggregation* aggregates different points of the same timestamp based on the aggregation type.

The *Data normalization configuration* section has all the configurations concerning normalization data.

- The *Data type* dropdown lets the user configure the data type. This can be either history, point, or a tag. Once selected, either add history, point or tag in the *Data Value* field.
- The *Rollup Interval* option is to choose the intervals at which data will be rolled up.
- The *Rollup Type* option is for performing the selected operation on the records between intervals for the main data history.
- *Aggregation option* is for aggregating all the rolled-up values together to a single value.
- *The Multiple history aggregation* aggregates different points of the same timestamp based on the aggregation type.

Area

The area option lets the users normalize the data based on area.

- The *Data type* dropdown lets the user configure the data type. This can be either a history or a tag. Once selected, either add history in *Data value* field or add a tag.
- The *Rollup Interval* option is to choose the intervals at which data will be rolled up.
- The *Rollup Type* option is for performing the selected operation on the records between intervals for the main data history.
        - *Sum*: Sum of all the records within the chosen *Time Interval*.
        - *Difference:* Difference between the first and last records within the chosen *Time Interval*.

        - *Max:* The highest recorded value within the chosen *Time Interval*.
        - *Min:* The lowest recorded value within the chosen *Time Interval*.
        - *Avg:* The average of all the records within the chosen *Time Interval*.
- Similarly, *Aggregation option* is for aggregating all the rolled-up values together to a single value.
- *The Multiple history aggregation* aggregates different points of the same timestamp based on the aggregation type.

The *Data normalization configuration* section has all the configurations concerning normalization data.

- The *Data type* dropdown lets the user configure the data type. This can be either *Manual* or *Point*. Once selected, either enter the area manually or choose a point from which the area can be fetched in the *Data Value* field.

Scheduling

- To schedule report generation based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Report* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
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- *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Emailing Reports

- To enable mailing of reports, toggle the *Send Email* toggle on.
- The reports can be sent to either a user's mail as configured in Niagara or any custom recipient. To configure, click the *Email Recipient* button, which triggers a configuration popup.
    - To send to Niagara users (with email address configured in their respective Niagara user profiles), select *User* from the *Type* dropdown. Select the username from the *User* dropdown and click the *+* button. Repeat the process until all the users are added. Click the trash icon to remove an added user.
    - To send to custom recipients, select *Email* from the *Type* dropdown. In the *Email* field, enter the desired email address and click the *+* button and repeat until all email addresses are added. Click the trash icon to remove an added email address.
    - To not mail any empty reports in case the data is empty, toggle *Ignore Empty Data.*
    - Click *Save* to save the configuration, or *Cancel* to discard without saving changes.

Save Reports

- To save a report to the preconfigured location, toggle *Save Report* on.

Export As

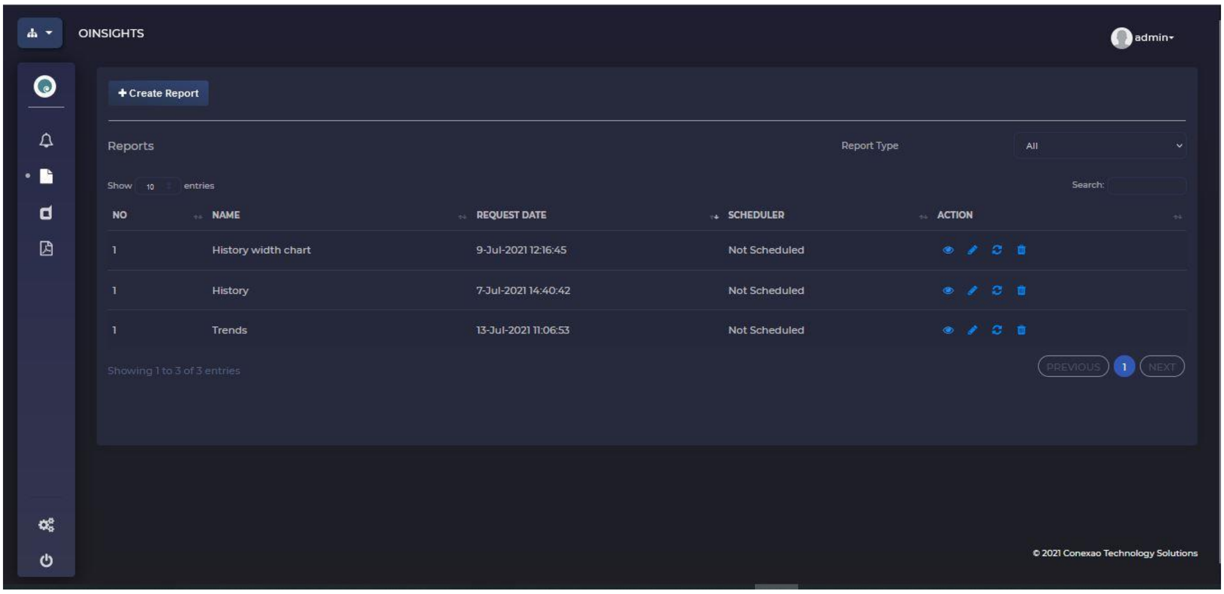
The user can select the format in which the report will be saved to storage or emailed. To export as PDF, toggle the Pdf toggle on, to export as CSV, toggle CSV on, and to export as Excel, toggle Excel on.

Generating and Saving Report Configuration

- To save the configuration and/or generating the report, click the *Generate button.*
- To exit without saving changes, click the *Cancel* button.

Report Information & Report Actions

On the existing reports that are created that are listed on the *Create Reports* page, the user can perform various actions.



Created Reports

Report Table

- The users can filter the reports by report type by selecting the desired type from the *Report Type* dropdown above the table.
- The *Name* column shows the report name as configured by the user while creating/scheduling the report.
- The *Request Date* field shows the date/time of the last successful instance of report generation.
- The *Scheduler* Column shows the schedule of the report if the report is scheduled.
- Select the number of entries to be shown on a single page from the *Show Entries* dropdown and the <*Previous, Page No,* or *Next*> buttons to navigate across pages.

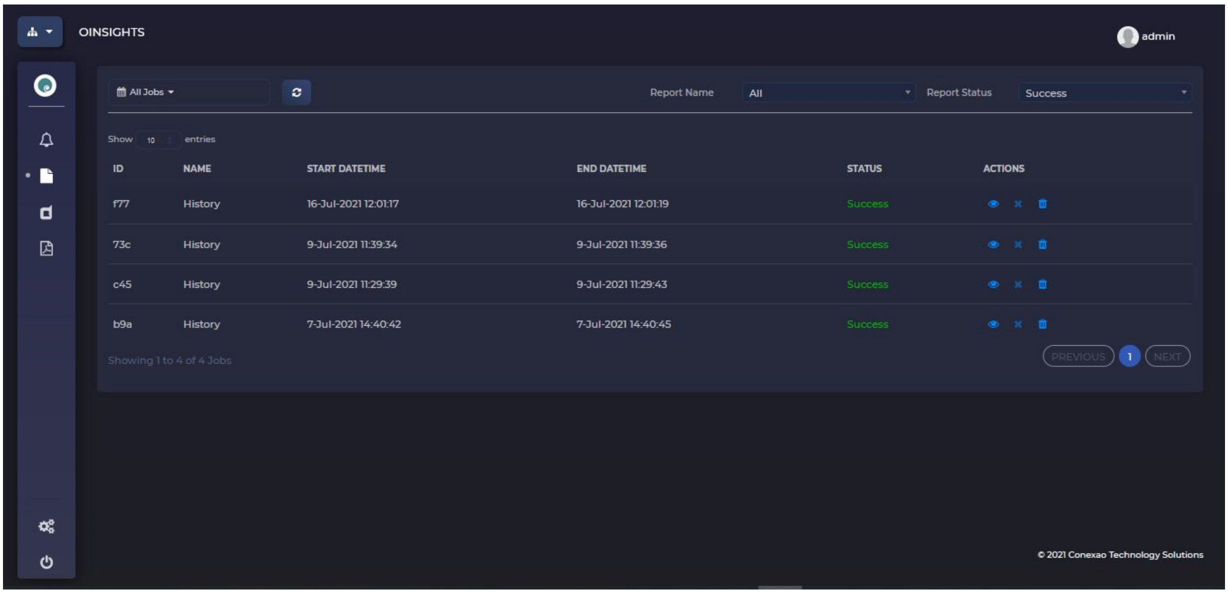
Report Actions

- The first eye icon triggers a *Report List* popup which shows all the generated instances of the report. In the popup, click the eye icon to view the report, the table icon for the raw data view in an HTML table, the cross icon to stop the generation of the report, and the trash icon to delete the instance of the report from the database. The *Status* column indicates the status of the report generation – where *Success* indicates succeful generation, *In Progress* indicates that report generation is in progress and *Failed* indicates failed generation of reports. To search/filter items, type the text in the *Search* field. To close the popup, click the close button (x) in the right top corner of the popup, and refresh icon on top to refresh the status of report generation.

- The second pen icon edits the report, where the user can modify the date-time range, column configuration, scheduling, email/save options, and export formats. To close the popup without saving changes, click the *Cancel* button or click the *Update* button to save changes.
- The third generate icon generates a single instance of the report. To cancel the generation, click the eye icon and from the list, click the second *x* button in the row. The state will change from *Running* to *Cancelled*. Alternatively, the same can be done from the *View Report* page.
- To delete a report, click the trash icon, and in the popup that appears, click *Okay* or *Cancel* to not delete the report. **Deleting the report will delete all the jobs associated with the report and can't be undone.**

View Reports

The *View Reports* page lists all the reports that are generated based on the reports created/scheduled by the user. The report table shows information such as *ID* (Report ID), *Name* (Report Name), *Start Datetime* (Start Time of the job), *End Datetime* (End Time of the job), *Status* (Job Status), and *Actions*.



View Reports

Filtering View Reports Table

- Click the date range picker dropdown at the top corner of the table area to expand and select the date for which the job records are to be shown. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the *Custom Range* option and select the start date/time in the first and the end date/time in the second.
- The *Report Name* dropdown field has two categories, *My Reports*, and *Public Reports*. Under *My Reports*, all the reports created by the user are nested, and under *Public Reports*, all the reports created by the other users that are of public access type are listed. The list can be filtered by entering the partial/complete report name in the dropdown text field.

- The *Report Status* dropdown lets the user filter the table by the status of the report job, where *Success* is a completed job, *Running* is a job that's in progress, *Queued* is a job that's queued and will start as the other jobs running ahead are completed, *Cancelled* is a user canceled job, and *Incomplete* is a job that has aborted without completion.
- The refresh button next to the date range picker dropdown refreshes the table and shows updated Job Status.

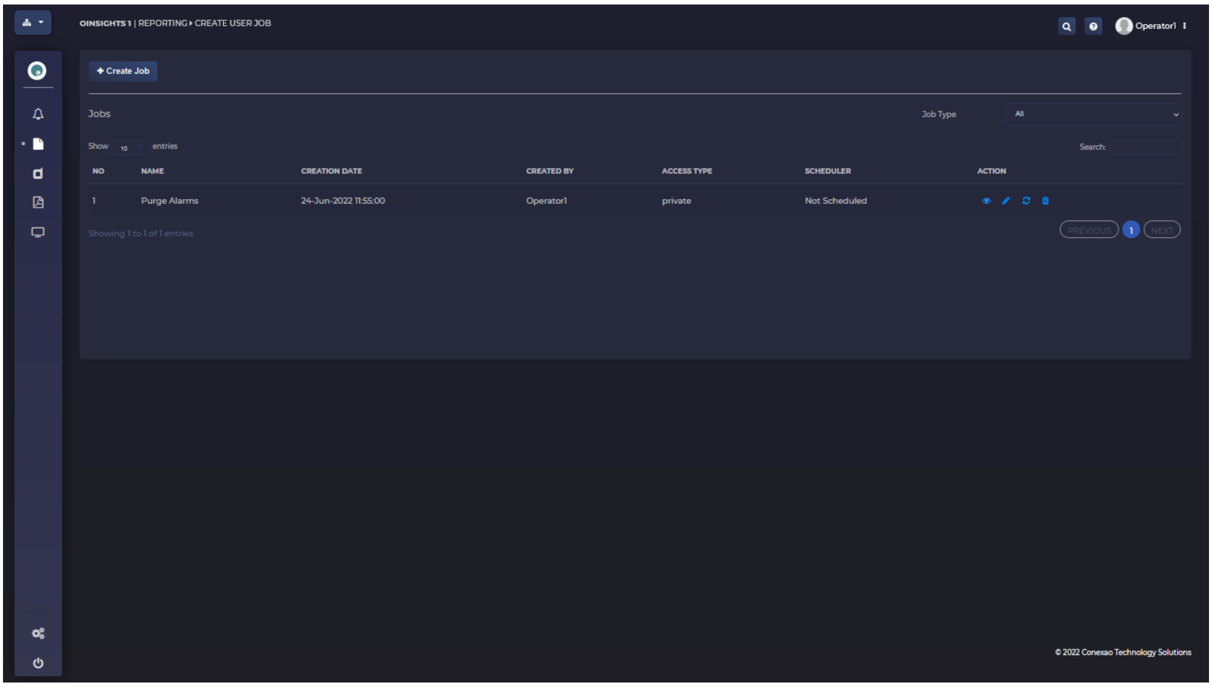
Report Actions

- In the action column of each record, the eye views the report, the cross icon stops the generation of the report, and the trash icon deletes the job record.

User Jobs

Create User Job

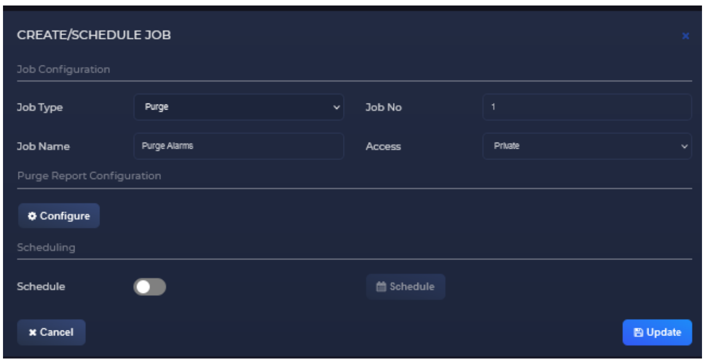
The *User Job* section lets the users create and view jobs that can be performed on the reports. Click the *Create User Job* to create a new user job. Users can view, edit, execute a single instance of the job or delete the job with the buttons in the *Actions* column.



Create User Job

Purge Reports

The *Purge Reports* job lets the users purge reports periodically based on the number of reports generated or age of reports by each report type.



Purging Reports

- From the dropdown, choose the *Purge* option to create a purge job.
- Fill in the *Job No.* and *Job Name* fields as desired.
- The *Access* option lets the user restrict everyone else from accessing the job or lets anyone access the job. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.

Configuring Purge

- To configure the purge settings, click the *Configure* button. The *Purge Reports* popup will show up.
- *Report type* lets the user choose the report types which are to be considered for purging
- *Criteria* lets the user specify the criteria on the basis of which the purging is to be carried out:
    - *Runs:* Purge reports based on number of runs of the reports.
    - *Duration:* Purge reports exceeding specified days.
- To save the configurations, click *Save* or click *Cancel* to discard.

Scheduling

- To schedule a purge job based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Job* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.

- *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
- *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Saving Purge Job Configuration

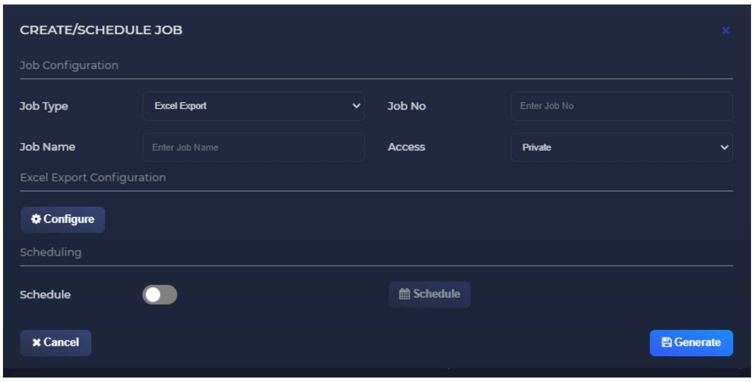
- To save the configuration, click the *Save* button.
- To exit without saving changes, click the *Cancel* button.

Excel Export

The *Excel Export* job fills in the data within a customized excel template, where BQL queries within the cells prefixed by *$$* will be replaced by resulting values. For instance, to return the top value of a point sorted by timestamp from history, the following query may be added to a cell:

$$history:/tut2/doorOpen|bql:select TOP 1 value order by timestamp asc

The job will only be executed properly if the query returns a single value.



Excel Export Job

- From the dropdown, choose the *Excel Export* option to create an excel export job.
- Fill in the *Job No.* and *Job Name* fields as desired.
- The *Access* option lets the user restrict everyone else from accessing the job or lets anyone access the job. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.

Configuring Excel Export

- To configure the excel export settings, click the *Configure* button. The *Excel Export Configuration* popup will show up.
- The *Input File* field is to add the path for the template which will be used to generate the report.
- The *Output File* field is to add the path where the resulting report(s) will be stored.
- To save the configurations, click *Save* or click *Cancel* to discard.

Scheduling

- To schedule an excel export job based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Job* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).
    - *Hourly:* Choose to generate the report for every selected hour(s).
    - *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
    - *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.
    - *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of*

every month(s) radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

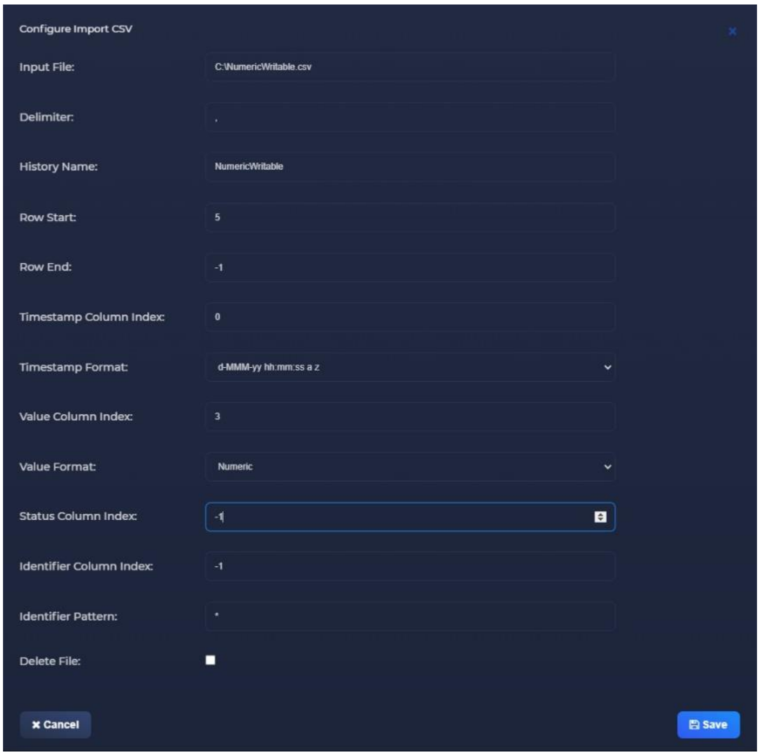
- *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Saving Excel Export Configuration

- To save the configuration, click the *Save* button.
- To exit without saving changes, click the *Cancel* button.

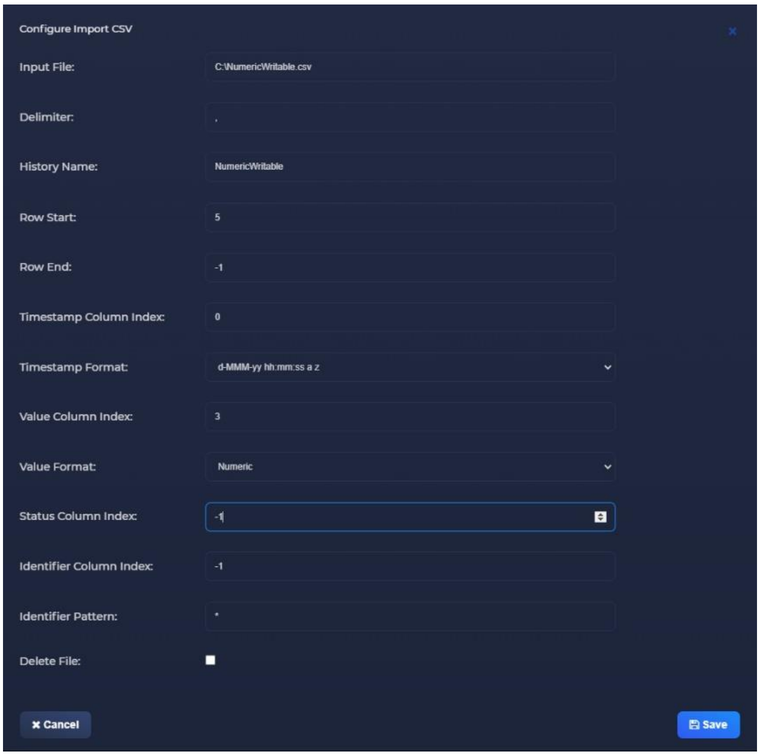
Import CSV Export

The *Import CSV* job lets the users import data from any CSV file and add it to any preferred Niagara history. The data expected are *Timestamp, Value,* and *Status,* where the first two are mandatory, without which the job will not be successfully executed.



CSV Import Job

- From the dropdown, choose the *Import CSV* option to create an import job.
- Fill in the *Job No.* and *Job Name* fields as desired.
- The *Access* option lets the user restrict everyone else from accessing the job or lets anyone access the job. To restrict the report to only the user (and users with write permission), select *Private* or leave as *Public* for access to all users.
    - If the report is to be shared with other users, the user can choose the *Shared* option. This lets other users view and generate reports, along with modifying the daterange of the report.



Configuring CSV Import

- To configure the CSV Import settings, click the *Configure* button. The *CSV Import Configuration* popup will show up.
- The *Input File* field is to add the path for the template which will be used to generate the report. In this template, *Timestamp* and *Value* are expected, and *Status* is optional. A sample CSV format is shown below.
- The *Delimiter* is the separator between the values. In CSV, the default is a comma, so typically this should be left as is.
- The desired history name should be added in the *History Name* field. If the history already exists and has an older time series than the CSV, then the data will be appended to the history. If not, a new history will be automatically created and data will be imported to the created history.
- *Row Start:* The row number at which the data starts.
- *Row End:* The row number at which the data ends. Leaving it as *-1* will consider till the last row of the file.
- *Timestamp Column Index:* Column in which the timestamp data is added. The first column is *0, the* second is *1, the* third is *2,* and so on.
- *Timestamp Format*: Enter the desired date format in the *Date Format* field with *ddMMyy* where *dd* denotes the date, MM the month, and yy the year, and the desired time format where

HH:mm:ss where *HH* denotes the hours, *mm* the minutes and *ss* the seconds.

- *Value Column Index*: Column in which the value data is added. The first column is *0, the* second is *1, the* third is 2, and so on.
- *Value Format*: The format of the value. Choose *Numeric* for numeric data, *Boolean* for Boolean, and *String* for string.
- *Status Column Index:* Column in which the status data is added. The first column is *0, the* second is *1, the* third is 2, and so on. If the status is to be ignored, leave it as *-1*.
- *Identifier Column Index:* An advanced feature for filtering data by [Regular Expressions](). To filter data rows by RegEx expression-based filters, change the value to *1*. To ignore,
- *Identifier Pattern:* If enabled (i.e. the *Identifier Column Index* is set to *1*), add the RegEx here to filter rows.
- *Delete File:* Check this to delete the CSV file once the job is executed successfully. This will help prevent multiple executions of the same job which is already performed.

Timestamp	Trend Flags	Status	Value
05-Jul-22 5:33:00 PM IST	{ }	{unackedAlarm}	52
05-Jul-22 5:34:00 PM IST	{ }	{alarm,unackedAlarm}	30.5
05-Jul-22 5:35:00 PM IST	{ }	{unackedAlarm}	46.9
05-Jul-22 5:36:00 PM IST	{ }	{unackedAlarm}	41.2
05-Jul-22 5:37:00 PM IST	{ }	{alarm,unackedAlarm}	24.1
05-Jul-22 5:38:00 PM IST	{ }	{alarm,unackedAlarm}	21.1
05-Jul-22 5:39:00 PM IST	{ }	{unackedAlarm}	50.9
05-Jul-22 5:40:00 PM IST	{ }	{alarm,unackedAlarm}	33.4
05-Jul-22 5:41:00 PM IST	{ }	{alarm,unackedAlarm}	30.1
05-Jul-22 5:42:01 PM IST	{ }	{alarm,unackedAlarm}	30.3
05-Jul-22 5:43:00 PM IST	{ }	{alarm,unackedAlarm}	58.1
05-Jul-22 5:44:00 PM IST	{ }	{unackedAlarm}	49.9
05-Jul-22 5:45:00 PM IST	{ }	{unackedAlarm}	38.3
05-Jul-22 5:46:00 PM IST	{ }	{unackedAlarm}	39
05-Jul-22 5:47:01 PM IST	{ }	{unackedAlarm}	38.4
05-Jul-22 5:48:00 PM IST	{ }	{alarm,unackedAlarm}	25.1
05-Jul-22 5:49:00 PM IST	{ }	{alarm,unackedAlarm}	21.8
05-Jul-22 5:50:00 PM IST	{ }	{unackedAlarm}	39.3
05-Jul-22 5:51:00 PM IST	{ }	{unackedAlarm}	42.5
05-Jul-22 5:07:00 PM IST	{ }	{alarm,unackedAlarm}	27.8
05-Jul-22 5:53:00 PM IST	{ }	{unackedAlarm}	54

Sample CSV file. Column headers are for reference only.

Scheduling

- To schedule an excel export job based on a custom schedule, toggle the *Schedule* toggle on.
- The *Schedule* button triggers the *Schedule Job* popup where the user can choose the schedule timing.
    - *Minutes:* Generate reports for every selected minute(s).

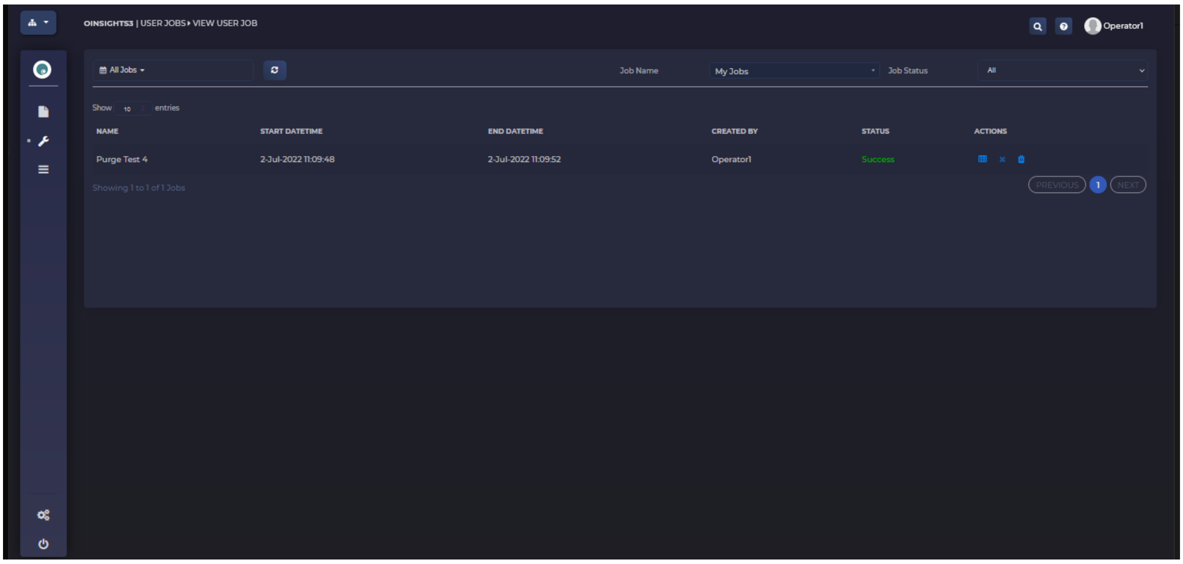
- *Hourly:* Choose to generate the report for every selected hour(s).
- *Daily:* Generate reports for either every selected number of days or every weekday at the selected time.
- *Weekly:* Check the days of the week and the time when the report is to be generated from the *Start Time* dropdown.
- *Monthly:* For generating a report on a specific day of every nth month, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.
- *Yearly:* For generating a report on a specific day of every nth year, use the *Day* radio button. For selecting a specific weekday of every month, use The *nth day of every month(s)* radio button. Select the time when the report is to be generated in the *Start Time* dropdown.

Saving Excel Export Configuration

- To save the configuration, click the *Save* button.
- To exit without saving changes, click the *Cancel* button.

View User Job

The *View User Job* page lists all the user jobs that are performed based on the jobs created/scheduled by the user. The table shows information such as *Name* (Display name for the job), *Created By* (User who created the job), *Status* (Job Status), and *Actions.*



Filtering View User Job Table

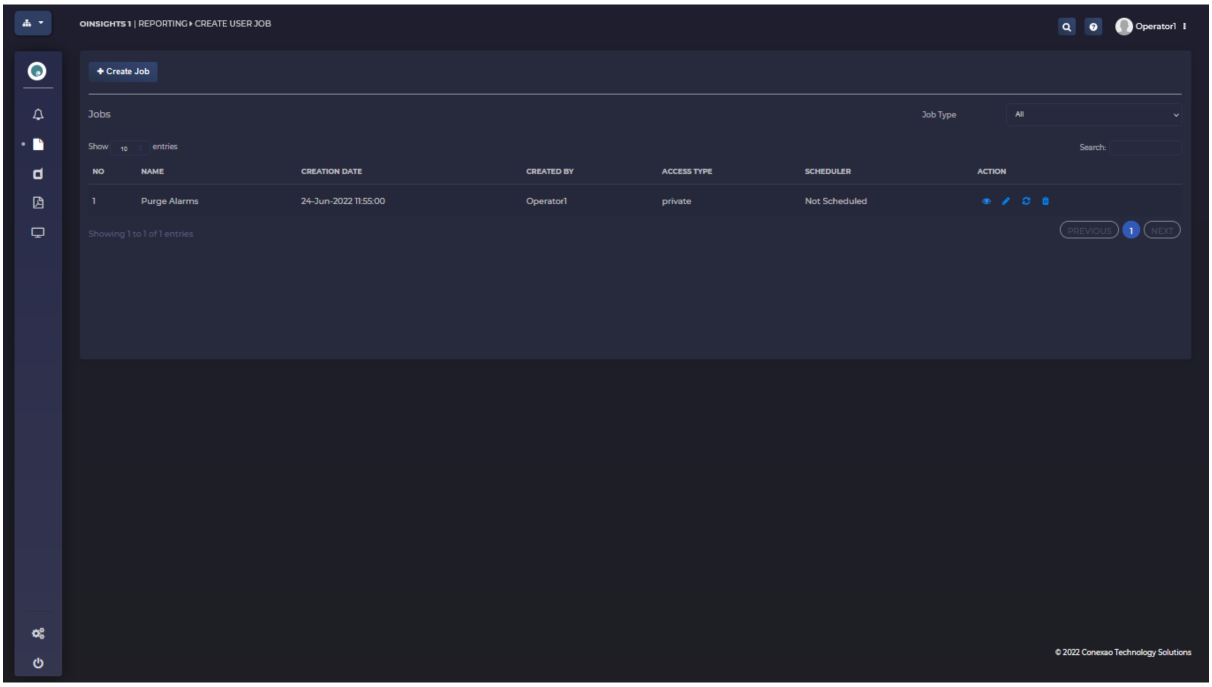
- Click the date range picker dropdown at the top corner of the table area to expand and select the date for which the job records are to be shown. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the *Custom Range* option and select the start date/time in the first and the end date/time in the second.
- The *Job Name* dropdown field has two categories, *My Jobs,* and *Public Jobs.* Under *My Jobs,* all the jobs created by the user are nested, and under *Public Jobs,* all the jobs created by the other users that are of public access type are listed. The list can be filtered by entering the partial/complete job name in the dropdown text field.
- The *Report Status* dropdown lets the user filter the table by the status of the user job, where *Success* is a completed job, *Running* is a job that's in progress, *Queued* is a job that's queued and will start as the other jobs running ahead are completed, *Cancelled* is a user

cancelled job, and *Incomplete* is a job that has aborted without completion.

- The refresh button next to the date range picker dropdown refreshes the table and shows updated Job Status.

User Job Actions

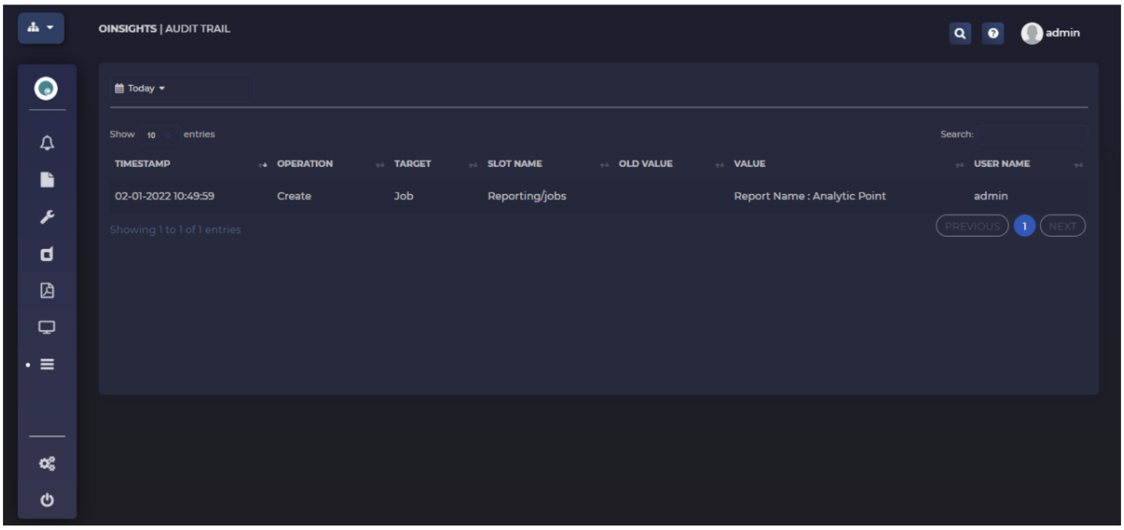
- In the action column of each record, the eye icon shows the job details, the cross icon stops the generation of the job, and the trash icon deletes the job record.



Create User Job

Audit Trail

The *Audit Trail* shows a detailed audit trail for each action performed in O-Insights Reporting Engine. The audit trail can be accessed from sidebar by selecting *Audit Trail.*



Audit Trail

- To select a custom audit history if required, expand the menu by clicking the username on the top right and click *Audit History*. In the popup that appears, enter the Niagara history ord for the audit trail, which will be rendered in the table.
- Click the date range picker dropdown at the top corner of the table area to expand and select the date for which the audit trail records are to be shown. The users can select *Today* for selecting Today's records, *Yesterday* for selecting Yesterday's records, *Last 24 hours* to select the records from the last 24 hours, *This Month* to select the current month's records, and *Last 30 days* or *Last 7 days* to select the records for the past 30 days or the past 7 days, respectively. To choose any custom date range, select the *Custom Range* option and select the start date/time in the first and the end date/time in the second.
- The *Timestamp* column lists the timestamp of the audit trail event, *Operation* lists the operation performed, *Target* shows where the operation is performed, *Slot* lists Niagara slot for the event, *Old Value* shows the old value which has been changed, *Value* shows the current value, and *User Name* shows the user who performed the action.

Report Templates

The layout of each type of report can be customized by the user by using the report templates. For modifying a report template or creating access the Template folder from the query engine folder (typically at *C:\Program Files (x86)\Query Engine\Templates*) and either edit one of the *Defaultx.JSON* files or create a new JSON file by copying the existing one. The template will be automatically picked up by the Reporting Engine.

Customizing Report JSON Templates

Customizing the report JSON lets the users create their reporting templates/modify the existing template to fit their requirements. Open the JSON in any text editor (preferably Notepad++ or similar) and refer to the table below to understand the parameters and modify them as per requirement. **Parameters marked in red are mandatory.**

Parameter	Function
{ (Starting point of the JSON)	
"Version": "1", *"Assembly": "DefaultTemplate",* *"Type": "DefaultTemplate.DefaultTemplate",*	Should not be modified
***"Template": {* (Template properties)**	
"Name":	Unique name for the template
"ExcelTemplateName":	If the file should be exported to excel, provide the name of the *.xls* template which must be in the same folder as the JSON
"ReportType":	The type of the report. The available types are *History, Alarm, Alarm_Trends, Audit, Snapshot, Analytics.* If the template is to be made available to multiple report types, the user can add multiple types by adding types separated by comma(s) within the quotes.
"PageSize":	The page size of the report. Available options are *A0, A1, A2, A3, A4, A5, A6, B5, Ledger, Legal, Letter.*
"PageOrientation":	The orientation of the report. Available options are *Portrait* and *Landscape.*
"MarginLeftInCm":	Left page margins in centimeters.
"MarginTopInCm":	Top page margins in centimeters (which starts after the header).

“MarginRightInCm”:	Right page margins in centimeters.
“MarginBottomInCm”:	Bottom page margins in centimeters (which starts after the footer).
“HeaderTopDistanceInCm”:	Spacing between the header and the top of the document.
“FooterBottomDistanceInCm”:	Spacing between the footer and the bottom of the document.
***“DocumentElements”: [* (Static elements of the documents like header/footer/custom)**	
"HasHeaderRow"	Whether to show the name of the elements used in the header above. In most cases, leave as *false*.
"TableType"	Type of the portion of the document where the content entered below should appear. If header, use *Header,* for the footer, use *Footer,* or for the table, use *Table*. Based on the type, the content entered within this will show up on top (header), bottom (footer), or between header and footer (table).
{ *"InsertPageBreak":* *},*	Use to insert page break (end the page and start the next one). Use *true* to insert a page break.
***"StyleSettings": {* (Style settings for everything within *DocumentElements*)**	
"FontFamily":	Font family name for the table. Any font installed in the system can be used here.
“FontSizeInPt":	Font size (in points)
"FontStyle":	Font style. Available options *Regular, Bold, Italic, BoldItalic, Underline.* Multiple options can be applied with comma separation.
"SpacingBeforeInPt":	Row top spacing in points
"SpacingAfterInPt":	Row bottom spacing in points
"BorderWidthInPt":	Table border line thickness in points (*0* for no border)
"BorderStyle":	The borders which are to be shown. Available options are *None, Top, Bottom, All*
***“Columns”: [:* (Column Elements within the *DocumentElements*)**	
"Data": { *"Data": },*	Name of the cell
“WidthInCm":	Custom column width in centimeters, if required.
"TakeAverageColumnWidth":	Take column width as the average of the total available width. To enable, use *true* or to disable use *false*. Ideally left as true for all columns to have the even width. If enabled, *WidthInCm* will be ignored.

"Type":	Data type to be populated in the cell. Available Options: *Text* for Text, *Image* for image, *and PageNum* for Page Number.
"RowData": [**(Row properties that correspond with *Columns* data. Elements within the *DocumentElements*)**	

{
*"*Cellname here*":*
	Within the "RowData": [] brackets, all the row data should be listed. **Note that row data names should correspond to the name of the cell as defined in *Columns*.** For instance, if you have:
	{
	"Data": {
	"Data": "LeftLogo"
	}
	within the *Columns*, a corresponding *RowData* should exist, like:
	{
	"LeftLogo":
	},

"Data":	Enter the desired data as per the *Type* defined in the *Columns* section. If the Column type is text, enter the text required within the quotes, if image, enter the image location, and if page number, leave it blank.
"VerticalAlignment":	Alignment of the content within the cell vertically. Available options are *Top, Center, Bottom.*
"HorizontalAlignment":	Alignment of the content within the cell vertically. Available options are: *Left, Center, Justify, Right.*
Data Table: *{}* (The main report data table)	
"TableName": "Table1"	Do not modify.
"HeaderRowOnEveryPage":	To show the data table header on every page, use *true* or to just show the header in the beginning once, use *false*.
"TableHeaderBackgroudColor":	The color code for the table header background in hex.
"RuleColumns": ["Column Name" *],*	If a certain column is only to be considered for applying the rule (as shown below), enter the column name within the quote. Leave as blank to checking all the columns for the below rule.
"Rule": [{ *"*Colour*": [*Number1,Number2*]}*	To colour code a particular cell within the range of >=Number1 and <=Number2 with a Colour. For eg, to colour code every cell with a range between >=10 and <=50 with the colour red, use:

	"Rule": [{ "#ff0000": [10,100] *]}*
"TableHeaderTextColor":	Colour for data table header row in hex.
"TableBodyBackgroudColor":	Data table background colour in hex.
"TableBodyTextColor":	Data table text colour in hex.
*"ExtraColumns": [{"*Extra Column Name*" : "*Extra Column Text*"},]*	The Extra Column option lets the users insert an extra column of a chosen name and repeating text in the following rows in the given format. To generate blank columns, leave the column text blank. This can be typically used to generate blank columns for writing/signing purposes.
"TableHeaderTextStyle":	Data table header text style. Available options *Regular, Bold, Italic, BoldItalic, Underline.* Multiple options can be applied with comma separation.
"StyleSettings": {} (The style settings for the data table)	
"FontFamily":	Font family name for the table. Any font installed in the system can be used here.
"FontSizeInPt":	Font size (in points).
"FontStyle":	Font style. Available options *Regular, Bold, Italic, BoldItalic, Underline.* Multiple options can be applied with comma separation.
"BorderWidthInPt":	Table border line thickness in points (*0* for no border)
"BorderStyle":	The borders which are to be shown. Available options are *None, Top, Bottom, All*
Chart: *{}* (The chart)	
"ChartName":	Choose a name for the chart.
"Colors": [""],	Custom colours if required. Enter all the colours in hex code separated by a comma in the quotes.
"TableName": "Table1"	Do not modify.
"XAxisLabel":	X-axis label name to be displayed.
"YAxisLabel":	Y-axis label name to be displayed
"TrueValue":	Enter the numeric value for *True* if a Boolean point is selected.
"FalseValue":	Enter the numeric value for *False* if a Boolean point is selected.
"WidthInPercentage":	Width of the chart in percentage.
"HeightInCm":	Height of the chart in centimeters.
"LineWidth":	The thickness of the line in the line chart.

Keys in JSON Templates

To include dynamic content within the report (like date/page number/time stamp), keys can be used within the reporting templates. All available keys are listed below.

Keys	Function
%FROM_DATE%	From date of the data, as selected in the date range picker.
%TO_DATE%	To date of the data, as selected in the date range picker.
%FROM_DATE_TIME%	From date and time of the data, as selected in the date range picker.
%TO_DATE_TIME%	To date and time, as selected in the date range picker.
%REPORT_NO%	The report number, as configured by the user.
%REPORT_NAME%	The report name as configured by the user
%GENERATED_ON%	The date & time of generation of the report.
%GENERATED_TIME%	The time of generation of the report.
%GENERATED_DATE%	The date of generation of the report.
%TIME_INTERVAL%	The time interval, as selected by the user.
%FROM_TIME%	From time of the data, as selected in the date range picker.
%TO_TIME%	To time of the data, as selected in the date range picker.
%IP_ADDRESS%	IP Address of the server running the reporting engine.

Excel Templates

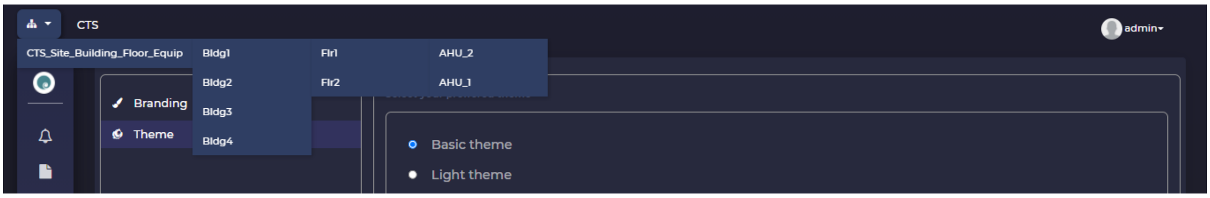
If the user intends to use the excel format (.xls), the name must be specified in the XLS template as indicated above, which should reside in the same folder as the JSON. In the file, users can also make use of the keys as shown above, and the keys in the template will be replaced by actual values (as shown in the table).

Configuring Departments

To make user of the *Scope* functionality, departments should be configured in Niagara Workbench.

- Open the *CtsOInsightsBMS* module in the Niagara Workbench *Palette*.
- Drag and drop the *OInsightsUserExtensions* from the *Extensions* folder to the desired user in the workbench (*Config->Users*).
- Add the department name in the *Department* field.
- Repeat the process until all the desired departments are added.

Hierarchies



The Hierarchies functionality displays Hierarchies as configured in Niagara based on tagging. The hierarchies built on Niagara will be automatically picked up by O-Insights for BMS.

To open hierarchies, hover over the hierarchy button on the top corner, and once expanded, navigate and open pages as desired.