



Enghouse
Interactive

Enghouse Reporting

Release notes

Version 5.6.0

01/23/2026

Contents

- Reporting 5.6..... 3
- Reporting 5.5..... 5
- Reporting 5.4..... 7
- Reporting 5.3..... 9
- Reporting 5.2..... 11
- Reporting 5.1..... 13
- Reporting 4.6..... 16
- Reporting 4.5..... 19
- BI Reporting 4.4 22
- BI Reporting 4.3 25
- BI Reporting 4.2 27
- BI Reporting 4.1 30
- BI Reporting 4.0 33
- Enghouse BI Lite 3.0.1 36
- Enghouse BI Lite 3.0 37
- Enghouse BI Lite 2.1.0 40
- Enghouse BI Lite 2.0.0 42

Enghouse BI Lite 0.2.0-alpha 44

Enghouse BI Lite 0.1.0-alpha 46

Reporting 5.6

Version 5.6.0 (01/23/2026)	3
New Features	3
Bug fixes	4
Known Issues	4
Upgrade Notes	4

Version 5.6.0 (01/23/2026)

New Features

Editable JWT shared secret

You can now edit the shared secret when using Single Sign On via JSON Web Token (JWT).

Validation

Validation is a new feature a Data Designer can set up that is used to define and validate the content a user introduces in the filters or settings.

Kubernetes installation

The official documentation now includes a new document detailing the installation and management of Reporting Suite in a Kubernetes environment.

New subscription setting

We have added the new subscription setting which allows the system manager to set the maximum number of subscriptions to be executed simultaneously.

Two new custom variables

We've added two new custom variables (`_reportTarget` and `_reprotType`) to the variables list. The former is used to specify the delivery format for an asset, while the latter indicates what type of element (DATASOURCE, REPORT, REPORT_VIEW, or DASHBOARD) is represented in the data model or assets

System - Schedules report

Reporting Suite now has a new system report called System - Schedules that delivers a clear, role-based snapshot of all scheduling data within the environment.

Exporting dashboards in the email format

You can now export dashboards in email format. The dashboard contents are now delivered as an image.

Interactive filtering in dashboards

Certain elements, such as table and chart, support interactive filtering, enabling users to filter related data by selecting a value within the element itself. When those elements belong to the same group, a single selection propagates across the entire dashboard, keeping the displayed data synchronized.

Trusted user

A new feature now lets you label a user as a trusted user. This means their license requests will be approved automatically, meaning that the System Administrator won't need to act.

NodeJS 24

We've upgraded NodeJS version to 24 for all ERS NodeJS modules.

SecondsToTimespan

We've added the new SecondsToTimespan custom function to convert an integer to a timespan.

Third party libraries update

Dependencies and libraries used for various segments of the Reporting app have been updated to ensure better performances, provide vulnerability fixes, and to stay up-to-date with the newest technologies.

Bug fixes

- Fixed dependent variables that did not work when depending on the date range variable.
- Prevented users from logging in via SSO if their username does not match the ERS internal user constraints.

Known Issues

- The percentage text format always uses three decimal places.
- Column sorting: When data is sorted by column, sometimes the user's default filters and settings are restored.
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty.
- Database cache not properly working. Always set USE_VIEWER_DB_CACHE and USE_DESIGNER_DB_CACHE to "false" to prevent unexpected reports behaviors. Database cache settings are now disabled by default.

Upgrade Notes

Upgrade is possible from any previous version of Reporting for Linux. Upgrading from Reporting versions older than that is not supported, as they require manual porting of custom reports.

Reporting 5.5

Version 5.5.0 (10/15/2025)	5
New Features	5
Bug fixes	6
Known Issues	6
Upgrade Notes	6

Version 5.5.0 (10/15/2025)

New Features

Database connections

When creating a new tenant, the UI now includes an expanded Database Connections section. The brand-new feature lets you name the connection string, while the existing options, namely selecting the tenant's database type and specifying the connection string used for standard reports, have simply been moved into this section.

Compressed attachments

You can now export scheduled reports and dashboards you are subscribed to as compressed attachments. The export works for PDF, Excel, and CSV formats, letting you receive the files in a smaller, zip-packed bundle.

Undo/Redo button

The updated UI of the data model editor now includes new Undo and Redo buttons. These buttons let the Data Designer step backward or forward through modification history before saving.

Kubernetes deployment improvements

We've introduced extensive configuration options, making the Kubernetes deployment far more flexible and customizable.

Docker-Compose repository change

The Bitnami image repository has been replaced with the Bitnami Legacy repository. Because of this licensing shift, older Bitnami images can no longer be pulled automatically. To continue using Docker-Compose, you must upgrade to the latest version of our stack, which references the new Bitnami Legacy repository.

Existing deployments that already have the legacy Bitnami images installed will continue to work, but you cannot create new instances of those older images.

Bug fixes

- First database initialization no longer fails in a new installation.
- Fixed the SSO JWT roles support issue. You can now assign the proper user role (instead of just viewer) to an authenticated user.
- Fixed tenant isolation issue when same username is used in multiple tenants.
- Fixed the deleted style issue that caused an error to appear when a report view used a deleted style. Because of global styles, this error no longer exists.

Known Issues

- The percentage text format always uses three decimal places.
- Column sorting: When data is sorted by column, sometimes the user's default filters and settings are restored.
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty.
- Database cache not properly working. Always set `USE_VIEWER_DB_CACHE` and `USE_DESIGNER_DB_CACHE` to "false" to prevent unexpected reports behaviors. Database cache settings are now disabled by default.

Upgrade Notes

Upgrade is possible from any previous version of Reporting for Linux. Upgrading from Reporting versions older than that is not supported, as they require manual porting of custom reports.

Reporting 5.4

Version 5.4.0 (07/10/2025)	7
New Features	7
Bug fixes	8
Known Issues	8
Upgrade Notes	8

Version 5.4.0 (07/10/2025)

New Features

Dashboard control buttons

Dashboards now have two control buttons. These are the Reset All Filters button and the Download button. The former removes all filters on a chosen dashboard, while the latter shows a dropdown menu where you can choose a format in which to download your chosen element.

Automated report and dashboard delivery improvements

Reporting Suite now has additional settings when exporting the reports in the Excel format as well as the option to export both your reports and dashboards in the CSV format. Additionally, you can now choose whether to export the whole dashboard or just a relevant widget in the Element section.

Tenant settings

An administrator can now choose when to warn a user about a license expiring and set up the starting day of the week.

Global settings

A system administrator can now specify the maximum failed attempts before lockout and also adjust the lockout duration.

Dashboard interaction buttons

Dashboards now have four new interaction buttons - edit, share, duplicate, delete.

Report hyperlinks open in the same tab

Previously, clicking a hyperlink to open a report would open it in a new tab. Now, reports open in the same tab.

Added support for EKS deployment

We now support the deployment of Kubernetes on Amazon Elastic Kubernetes Service (EKS).

Bug fixes

- First database initialization no longer fails in a new installation.
- Fixed the SSO JWT roles support issue. You can now assign the proper user role (instead of just viewer) to an authenticated user.
- Fixed tenant isolation issue when same username is used in multiple tenants.
- Fixed the deleted style issue that caused an error to appear when a report view used a deleted style. Because of global styles, this error no longer exists.

Known Issues

- The percentage text format always uses three decimal places.
- Column sorting: When data is sorted by column, sometimes the user's default filters and settings are restored.
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty.
- Database cache not properly working. Always set USE_VIEWER_DB_CACHE and USE_DESIGNER_DB_CACHE to "false" to prevent unexpected reports behaviors. Database cache settings are now disabled by default.

Upgrade Notes

Upgrade is possible from any previous version of Reporting for Linux. Upgrading from Reporting versions older than that is not supported, as they require manual porting of custom reports.

Reporting 5.3

Version 5.3.2 (06/02/2025)	9
Bug fixes	9
Known Issues	9
Upgrade Notes	9
Version 5.3.0 (04/11/2025)	9
New Features	9
Bug fixes	10
Known Issues	10
Upgrade Notes	10

Version 5.3.2 (06/02/2025)

Bug fixes

- Reduced the delay on filter initialization upon opening a report.

Known Issues

- The percentage text format always uses three decimal places.
- Column sorting: When data is sorted by column, sometimes the user's default filters and settings are restored.
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty.
- Database cache not properly working. Always set `USE_VIEWER_DB_CACHE` and `USE_DESIGNER_DB_CACHE` to "false" to prevent unexpected reports behaviors. Database cache settings are now disabled by default.

Upgrade Notes

Upgrade is possible from any previous version of Reporting for Linux. Upgrading from Reporting versions older than that is not supported, as they require manual porting of custom reports.

Version 5.3.0 (04/11/2025)

New Features

Kubernetes deployment improvements

Infrastructure and monitoring components were removed from the Reporting Suite deployment. Support for EKS has been added.

API enrichment and improvements

Reporting Suite now has better support for managing tenants and reviewing error handling through APIs.

New groups management API

The Reporting.API now provides group management.

Added support for HTML documentation deployment

It is now possible to deploy the documentation in HTML format with the product.

Popup message on license expiring

If your license is about to expire, a message notifying you about the exact date will now pop up when logging into Reporting Suite.

Online documentation search bar

Our online documentation now has a search bar. This makes it easier to find any topic that mentions the terms you're looking for.

Include/exclude users that are not supervisors in Supervisor Monitoring report

The Supervisor Monitoring report now includes the option of including or excluding non-supervisor users.

Bug fixes

- First database initialization no longer fails in a new installation.
- Fixed the SSO JWT roles support issue. You can now assign the proper user role (instead of just viewer) to an authenticated user.
- Fixed tenant isolation issue when same username is used in multiple tenants.

Known Issues

- The percentage text format always uses three decimal places.
- Column sorting: When data is sorted by column, sometimes the user's default filters and settings are restored.
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty.
- Database cache not properly working. Always set USE_VIEWER_DB_CACHE and USE_DESIGNER_DB_CACHE to "false" to prevent unexpected reports behaviors. Database cache settings are now disabled by default.

Upgrade Notes

Upgrade is possible from any previous version of Reporting for Linux. Upgrading from Reporting versions older than that is not supported, as they require manual porting of custom reports.

Reporting 5.2

Reporting 5.2	11
Version 5.2.0 (01/28/2025)	11
New Features	11
Changed Features	12
Bug fixes	12
Known Issues	12
Upgrade Notes	12

Version 5.2.0 (01/28/2025)

New Features

Deleting a tenant

Currently, Enghouse Reporting Suite doesn't allow you to delete a tenant completely but just disable it. When a tenant is disabled, tenant's users are no longer able to access the web application. We have added information on how a System Manager can disable a tenant.

System reports

Previously, Reporting Suite offered using Standard reports. We have now introduced System reports. System Reports are typically tabular data reports that show you either a summary or detailed overviews of the relevant data. Usually, they can be adjusted to suit your needs using a variety of filters and settings, so that you can focus precisely on the data you need, while also having multiple options available. Only a System Administrator role has access to system reports.

System - Reports Check

Reporting Suite now includes its first system report, the System - Reports Check report. It was created to allow detecting inconsistent sharing of reports and their datamodels and missing parent assets.

Multi-tenant licensing model

Multi-tenant licensing model allows the license to be applied on a system-wide level and manages licenses allocation per tenant on a system administration level.

Each license now has an expiration date, meaning that licenses now expire.

Previously, the licenses had a limited combined number of users for the Designer and Data Designer user roles and an unlimited number of users for other roles. Now, the licenses limit the number of users for each role. When allocating licenses in multi-tenant mode, a system administrator can now see how many licenses have been allocated and how many they can still allocate.

Callback Summary report

A new Callback Summary report has been added to help contact center supervisors access data about the callback requests that occurred in each time, and to optimize the interaction handling by reviewing the time the agents respond to and spend on each callback request. Find out more information about their individual purposes and use in the standard reports documentation.

Improved API documentation

There are new sets of APIs (user management APIs, license management APIs, and report elements APIs) that provide a description, parameters, and examples of APIs for users who integrate with Reporting Suite. User management APIs allow products that integrate with Reporting Suite to create, update, and delete users. License management APIs make it possible for the integration to allow completely managing the license, while report element APIs allow for assets to be shared with users automatically.

Changed Features

Updated the “Creating a new tenant” procedure

There is now a Dashboarding enabled option that makes it possible to select the checkbox to enable Dashboarding.

When creating a tenant administrator, you must now also fill out the Confirm password field.

License settings

License settings now include a new table detailing the status of the license, its expiration date, and whether the license is valid or not. You can also now see the number of users and licenses per each role.

New features when uploading a license

When uploading a new license, you can now click the “Choose file” option. Before uploading, a pop-up now appears, detailing the information about the license.

Bug fixes

- First database initialization no longer fails in a new installation.

Known Issues

- The percentage text format always uses three decimal places.
- Column sorting: When data is sorted by column, sometimes the user’s default filters and settings are restored.
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty.
- Database cache not properly working. Set always USE_VIEWER_DB_CACHE to “false” to prevent unexpected reports behaviors.

Upgrade Notes

Upgrade is possible from any previous version of Reporting for Linux. Upgrading from Reporting versions older than that is not supported, as they require manual porting of custom reports.

Reporting 5.1

Version 5.1.1 (11/19/2024)	13
Bug fixes	13
Known Issues	13
Upgrade Notes	13
Version 5.1.0 (10/15/2024)	14
New Features	14
Changed Features	14
Bug fixes	15
Known Issues	15
Upgrade Notes	15

Version 5.1.1 (11/19/2024)

Bug fixes

- Fixed issue with optional grouping levels on “Agent State” views.
- Fixed issue by adding the “None” option to Queue filter of the Agent State report and Dependent views.
- Fixed translations bug. With version 5.1.0, using any language other than English prevented report views from being visualized.

Known Issues

- The percentage text format always uses three decimal places.
- Column sorting: When data is sorted by column, sometimes the user’s default filters and settings are restored.
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty.
- First database initialization can fail in a new installation; it may be required to restart the application to properly initialize the application database.
- On first tenant initialization, after configuring a new tenant, you sometimes need to restart the application for it to work properly.
- Database cache not properly working. Set always USE_VIEWER_DB_CACHE and USE_DESIGNER_DB_CACHE to “false” to prevent unexpected reports behaviors.

Upgrade Notes

Upgrade is possible from any previous version of Reporting for Linux. Upgrading from Reporting versions older than that is not supported, as they require manual porting of custom reports.

Version 5.1.0 (10/15/2024)

New Features

Uploading (fonts as) resources for report designers

Previously, if you used a font that was available on your computer rather than the server, you would see the report correctly, but other users who did not have the font installed could not see it. Now you can add a new resource by dragging and dropping a .ttf font file. This makes the font available to all users.

Adding and editing transformations in reports

The data transformation editor was previously available only to the Data Designer in the data model, while it is now available in the report model as well. The Report Designer can see the data aggregation created by the Data Designer in the data model they are using. However, they cannot edit or delete it. The Report Designer can, however, create a new data transformation to use certain aggregations that may be useful in the table view of a report.

Administrator users can configure Look and Feel

Administrators and System Administrators can choose which style and theme will be used for all the assets (such as report views) in a tenant.

Changed Features

Added Enghouse logo to login page

The Enghouse Interactive logo was added to the Reporting Suite login page.

Values filtered in view are sorted in the same order as in the original report

Previously, the values displayed in a View were sorted in the order in which they were selected by the designer of the view. This has been changed, and the values are now displayed in the same order as in the original report (without the unselected values).

Full compatibility with EIS specifications

Some changes have been made in the integration with EIS in order to apply the latest technical choices defined in the newest version of EIS.

Added warning message with unsaved View changes when trying to leave Editor

A warning message will now pop up if you try to leave the View editor without having saved the changes that you wished to apply.

Increased style name field width in style designer

On the Styles tab, the style Name field has been fitted to the size of the screen to make longer style names easier to read.

Review API documentation with Swagger

If a developer needs a list of APIs to integrate with Reporting Suite, they can use the Swagger page, which has been updated to include additional useful details for some of the APIs.

Standard reports changes

The following changes have been applied to existing standard reports:

- In the Outbound Campaigns report, new columns and filters have been added.

Bug fixes

- Fixed issue created by allowing System Administrators to rename the System tenant. This is no longer allowed.
- Fixed tenant licensing issue with users that use the same email address in various tenants.
- Fixed the issue created by allowing the creation of multiple tenants with the same name. This is no longer allowed.
- Removed the Report Snapshot option from the Download options in the Reports view.
- Fixed issue that allowed Viewers to see reports shared in the Can create view.
- Fixed issue that displayed the hidden filters after selecting the Restore default filters button.
- Fixed the paper orientation bug so that the portrait orientation is shown if you select portrait.

Known Issues

- The percentage text format always uses three decimal places.
- Column sorting: When data is sorted by column, sometimes the user's default filters and settings are restored.
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty.
- First database initialization can fail in a new installation; it may be required to restart the application to properly initialize the application database.
- On first tenant initialization, after configuring a new tenant, you sometimes need to restart the application for it to work properly.
- Database cache not properly working. Set always USE_VIEWER_DB_CACHE to "false" to prevent unexpected reports behaviors.

Upgrade Notes

Upgrade is possible from any previous version of Reporting for Linux. Upgrading from Reporting versions older than that is not supported, as they require manual porting of custom reports.

Reporting 4.6

Version 4.6.0 (05/29/2024)	16
New Features	16
Changed Features	16
Bug fixes	17
Known Issues	18
Upgrade Notes	18

Version 4.6.0 (05/29/2024)

New Features

Bulk actions in Data and Reports tabs

New bulk actions have been added to the Data and Reports tab where users with the appropriate access level can now switch to a list view of the assets and then perform bulk actions (delete, export, share, unshare).

Third party libraries update

Dependencies and libraries used for various segments of the Reporting app have been updated to ensure better performances, provide vulnerability fixes, and to stay up-to-date with the newest technologies.

New built-in function: TimestampDiffForDb

A new built-in function has been added to the Dictionary in Reporting which enables users to convert timestamps for different database types.

New logging centralization with Fluentd

Centralized application logging has been achieved through using Fluentd, and now there are no duplicate timestamps in messages that already include the timestamp. This is applicable to installations on Kubernetes environments only.

Changed Features

Sharing permissions

When sharing assets in Reporting, the sharing options have now been modified so that they include the following options when sharing reports:

- **Can read:** Users can read (and interact with) an asset the same way Viewer users can. Additionally, if they have the appropriate user role, they can also duplicate the asset, or, for example, create a report view based on a report shared with this permission level.
- **Can create view:** Users (primarily Power Viewers) can use the shared report as a base report for their report views, but they cannot see the report in their Reports tab, and they cannot interact with the report in any other way.

Furthermore, if a Power Viewer copies a report view and tries to edit it, but does not have the relevant access level for the base report of the copied view, an error message is now shown to indicate that they do not have the needed access level for the base report.

Check for duplicate names when creating assets

Previously, a check for duplicate names was performed only during the data model creation procedure. Now this check is performed when creating all assets, including reports, report views and styles.

Field name visualization using display names when creating view

During the report view creating procedure, report column (field) names are now displayed using the name of the field as shown in the report, and not as shown in the database, as was previously the case. If a translation is available, the field is shown in the selected user language.

Standard reports changes

The following changes have been applied to existing standard reports:

- Standard reports now include Call Survey Data.
- The Survey Metric column and filter have been added to the Survey Answer Detail report.
- The Survey Description filter has been added to all survey standard reports and CCaaS views.
- The Survey Question index has been added as a data grouping level to the Survey Summary standard report, while the Survey Metric filter has been changed to multi-select in the same report.
- The Survey Summary report now contains more columns related to survey answers.
- In the Queue Performance standard report, columns have been added to count handled and rejected interactions.
- In the Agent Interactions report, the “Show rows with 0 handled interactions” setting has been added.
- The HH:MM:SS format is now set as the default duration display format (in the settings) for all standard reports.

Data model creation steps

The data model creation steps have been slightly modified so that they are the same as the report creation steps.

Change in UI for improved viewing

Changes have been applied to the report viewer UI to ensure an improved viewing experience of reports and report views.

OIDC config role mapping

The EnghouseBILite_ prefix in OIDC config role mapping has been replaced with the ERS_ prefix. The previous prefix can still be used, but will be deprecated in upcoming versions of Reporting.

Bug fixes

- Fixed button overlap issue with dropdown list that occurred in some cases, e.g., when creating a report view.
- Fixed formatted date in all standard reports.
- Fixed issue with the end timestamp for “Callback Response” in the “CCaaS - Queue Interaction Detail” report.

- Fixed error related to permissions with report view continually refreshing after changing the base report.
- Fixed issue with changing the application language not working in the report editor.
- When configuring a tenant, it is no longer necessary to specify both the FQDN and the https:// prefix of the host, just the FQDN is now needed.

Known Issues

- The percentage text format always uses three decimal places.
- Column sorting: When data is sorted by column, sometimes the user's default filters and settings are restored.
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty.
- First database initialization can fail in a new installation; it may be required to restart the application to properly initialize the application database.
- On first tenant initialization, after configuring a new tenant, you sometimes need to restart the application for it to work properly.
- Database cache not properly working. Set always USE_VIEWER_DB_CACHE to "false" to prevent unexpected reports behaviors.

Upgrade Notes

Upgrade is possible from any previous version of Reporting for Linux. Upgrading from Reporting versions older than that is not supported, as they require manual porting of custom reports.

Reporting 4.5

Version 4.5.0 (02/15/2024)	19
New Features	19
Changed Features	20
Bug fixes	20
Known Issues	20
Upgrade Notes	21

Version 4.5.0 (02/15/2024)

New Features

Kubernetes Deployment Support

Kubernetes support has been introduced in this version, which has also resulted in high availability and scalability improvements. The Docker-compose deployment will be deprecated in the upcoming versions (End-of-Life date TBD).

Added reports and views features

Now when attempting to delete a report that has dependencies, such as views, you are given a warning that the dependencies need a new base report, which you can either choose then or select later. Additionally, when working with a report view, if you have the appropriate access level, you can change the used base report from within the view UI.

Added Email Server settings to UI

Administrators can now manage the email server settings, which was previously not available in the Admin tab.

Redirection on missing or unauthorized page

Users are now redirected to their home page if they attempt to open a page that is missing or that they do not have the appropriate access level to.

SSO standard role definition and more robust features

ERS Admins can now redefine the default role of users added to the system via SSO. Furthermore, the SSO integration is now more robust in terms of unexpected errors, such as timing out or similar.

Filter dependency support

This version includes the option to work with filter dependencies in reports and report views. Dependent filters are filters the options of which change based on what is selected in another filter (for example, if a country is chosen, then in another filter only the cities from that country are available as options).

Added visual improvements to filter tab

Visual improvements have been added to the Filters & Settings pane, so that now it is easier to understand which and how many values have been selected for the individual filters.

Added multi-metric support to Survey reports

The new version allows users to define multiple metrics used to evaluate the overall survey score within the report.

Changed Features

Changes to assets in the left pane

Assets such as reports are now sorted alphabetically by default in the left-hand pane of BI Reporting. Additionally, corporate (standard) reports are shown by default in the left pane.

Filter validation check added to subscription

When creating a new subscription to a report, a filter validation check is run to ensure all the relevant filters are entered as necessary.

Multiple submit prevention

Mechanisms have been added to prevent multiple concurrent submits in assets to ensure a proper functioning of the system and less load.

Bug fixes

- Fixed a number of errors and unwanted behavior in standard reports.
- Performances optimized to prevent report loading failures due to high volumes of user data being loaded at the same time.
- Fixed an issue with Firefox compatibility.
- Fixed session expired message not displaying.
- Fixed bookmark, now loading properly.
- Fix labels not correctly applying latest translations on the report view filters to now applying the proper translations.

Known Issues

- The percentage text format always uses three decimal places
- Column sorting: When data are sorted by column, sometimes the user's default filters and settings are restored
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty
- First database initialization can fail in a new installation; it may be required to restart the application to properly initialize the application database
- After configuring a new tenant, you sometimes need to restart the application in order for it to work properly
- Rows are not automatically expanded on longer strings, resulting in semi-visible data in report rows
- Database cache not properly working. Set always USE_VIEWER_DB_CACHE to "false" to prevent unexpected reports behaviors

Upgrade Notes

Upgrade is possible from any previous version of Reporting for Linux. Upgrading from Reporting versions older than that is not supported, as they require manual porting of custom reports.

BI Reporting 4.4

Version 4.4.3 (10/02/2023)	22
Bug fixes	22
Known Issues	22
Upgrade Notes	22
Version 4.4.0 (08/10/2023)	23
New Features	23
Changed Features	23
Bug fixes	23
Known Issues	23
Upgrade Notes	24
New Documentation	24

Version 4.4.3 (10/02/2023)

Bug fixes

- Fixed time zone issue for UTC-x time zones when selecting the date from the calendar. Before the fix, the calendar worked for UTC+x time zones, but for UTC-x time zones, the date applied to the report was a date before the one selected by the user. Now the correct time zone and date are applied.

Known Issues

- The percentage text format always uses three decimal places
- Column sorting: When data are sorted by column, sometimes the user's default filters and settings are restored
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty
- First database initialization can fail in a new installation; it may be required to restart the application to properly initialize the application database
- After configuring a new tenant, you sometimes need to restart the application in order for it to work properly

Upgrade Notes

Upgrade is possible from any previous version of BI Reporting for Linux. Upgrading from previous BI Reporting versions is not supported, as they require a manual porting of custom reports.

Version 4.4.0 (08/10/2023)

New Features

Standard reports

The following standard reports have been added:

- Concurrent Agents
- Survey Answer Summary
- Survey Detail

Find out more information about their individual purposes and use in the standard reports documentation.

Changed Features

Agent Availability Standard Report

Changes have been made to the report fields and the expressions used for them. Find out more in the related standard report documentation.

Added Dashboarding enabled elements to System Administrator UI

For System Administrator Users, in the Tenants section of the Admin tab, UI elements have been added that show whether a tenant has the Dashboarding feature enabled:

- A column in the Tenants table titled Dashboarding enabled, indicating if the feature is enabled or not, and
- a checkbox in the Tenant details window, when editing a tenant, where the System Administrator can choose to enable or disable the feature for the specified tenant.

Removed future dates from relative time frame filter selection

In Standard Reports, the option to use future dates in the relative time frame filter has been removed. Future dates can still be applied as filters by using the to and from Date Interval filter, i.e., the calendar date selection.

Bug fixes

- Fixed dividing by zero issue in the Agent Availability standard report

Known Issues

- The percentage text format always uses three decimal places
- Column sorting: When data are sorted by column, sometimes the user's default filters and settings are restored
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty
- First database initialization can fail in a new installation; it may be required to restart the application to properly initialize the application database
- After configuring a new tenant, you sometimes need to restart the application in order for it to work properly

Upgrade Notes

Upgrade is possible from any previous version of BI Reporting for Linux. Upgrading from previous BI Reporting versions is not supported, as they require a manual porting of custom reports.

New Documentation

Created new standard report documentation

Created new documentation for the standard reports listed in the first section of these Release Notes.

Updated existing user guides and Management Guide

Clarified the described new features in the appropriate documentation.

BI Reporting 4.3

Version 4.3.0 (02/01/2023)	25
New Features	25
Changed Features	25
Bug fixes	25
Known Issues	26
Upgrade Notes	26
New Documentation	26

Version 4.3.0 (02/01/2023)

New Features

Standard reports

The following standard reports have been added:

- Outbound Campaigns
- Supervisor Monitoring

Find out more information about their individual purposes and use in the standard reports documentation.

Changed Features

Removed download button from Reports tab

The download button that forwards users to the report viewer has been removed from the following locations:

- Reports tab tiles
- Reports side pane

Modified available System Administrator related actions

System Administrator users, i.e. their information, such as default email or password, can no longer be modified by other (Administrator) users in the Users section of the Admin tab. System Administrators can still perform the standard actions users can do for their own account, such as change their password or UI language.

Bug fixes

- Element export did not work properly if the element (report, data model, view...) was shared with a user via group. With this fix, users can now export elements when they are shared with them through groups.
- Fixed the evaluation of “% Status Time of Break” in the Agent Availability standard report.

- Some charts were not working as intended. With this fix, charts can now be properly visualized. Note that due to this, when upgrading from Version 4.2, you may need to run the import CLI tool with the forceReimport option enabled.
- When installing BI Reporting from scratch, all users of the “System” tenant were not included in the “Everyone” group. With this fix, this is now done automatically.

Known Issues

- The percentage text format always uses three decimal places
- Column sorting: When data are sorted by column, sometimes the user’s default filters and settings are restored
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty
- First database initialization can fail in a new installation; it may be required to restart the application to properly initialize the application database
- After configuring a new tenant, you sometimes need to restart the application in order for it to work properly

Upgrade Notes

Upgrade is possible from any previous version of BI Reporting for Linux. Upgrading from previous BI Reporting versions is not supported, as they require a manual porting of custom reports.

New Documentation

Created new standard report documentation

Created new documentation for the standard reports listed in the first section of these Release Notes.

Updated existing user guides and Management Guide

Clarified the described new features in the appropriate documentation.

BI Reporting 4.2

Version 4.2.0 (01/13/2023)	27
New Features	27
Changed Features	28
Bug Fixes	28
Known Issues	29
Upgrade Notes	29
New Documentation	29

Version 4.2.0 (01/13/2023)

New Features

Power Viewer user role

New role has been added to BI Reporting. Power Viewers are Viewers with extended access rights to work with report views. They can create report views based on reports shared with them, import and export the views, and share them with other users. They cannot create, edit, own or share full reports.

Styles

The Styles tab has been added and is available to both Designer user roles and Power Viewers. In this tab, users can work with the style designer tool to create new style sets and collections, which can be applied to reports and report views, exported and imported.

Time zone support

The Time zone report setting is now available in standard (and other) reports. This feature allows report users to choose which time zone the data, filters and other elements are used and shown in. In order to do so, the database data that is imported into the standard data warehouse needs to be prepared in a specific manner.

Show empty columns

The Show empty columns setting has been added to reports. This feature is used to choose whether or not you want to show rows with no data in your report.

Standard components import and update tool

A new tool has been added which allows you to import and export standard data models, reports and views for all tenants. This is a new command line tool which facilitates the process, as opposed to performing the same actions manually through APIs.

Standard reports

The following standard reports have been added:

- Self-service Checkpoint Detail

Find out more information about their individual purposes and use in the standard reports documentation.

Changed Features

Importing and exporting reports and report views

The report export and import feature has been improved with the following additions:

- Exporting and importing views
- Functionalities to facilitate use, such as selecting only views or only reports

Report view editor

The report view editor has been enhanced with the option to choose a style to be used with the report view.

Changed Admin SSO settings interface

For Administrator and System Administrator users, the JWT Validation Key setting is no longer required for Single Sign On via OpenID Connect.

Features currently disabled

The following features are disabled in this version of BI Reporting, but should be available in the upcoming releases:

- Connections manager
- Custom functions
- Designer debugging
- Mail server configuration UI
- “Shared network file server” support for report scheduling

Bug Fixes

- Tenant host has to be specified, both when providing just the host and providing protocol and host, to work properly. This fix now allows the user to specify just the real tenant host.
- Trying to login to an unknown tenant host returns a generic “wrong username or password” error. The fix now returns a proper message that explains that the provided host is unknown.
- Slow reports don’t work due to internal short timeouts. The fix now increases report timeout from 10 minutes to 1 hour.
- Changing the database type for a tenant doesn’t properly apply the change to standard the data models. The fix now properly updates all the standard data models.
- Once a filter is marker as “background filter”, it is no longer possible to remove the flag. The fix now allows the view editor to clear the “background filter” selection.
- When BI Reporting is installed, the license is not properly checked. The fix now enables the tenant licensing check.
- Pulling the images upgrades pgpool to version 4.4, which is not compatible with the existing version of the database. The fix now blocks pgpool version to 4.3.3 Security enhancement.
- It is allowed to access the master and slave instances of PostgreSQL directly from external clients. The fix now disables direct access from external clients to PostgreSQL instances, which can now be accessed just through the db.service container.

- PostgreSQL database doesn't require password. The fix now disables unauthenticated access.
- OIDC SSO configuration requires to specify the JWT key. The fix now removes this parameter, as it is automatically provided by the identity provider.
- Reports requiring many parameters with many values result in a HTTP 414 error and no result is returned to the user. The fix now resolve the "414 URI Too Long" error, sending parameters in the request body.

Known Issues

- Column sorting: When data are sorted by column, sometimes the user's default filters and settings are restored
- First chart visualization: The first time a report is submitted, sometimes charts are shown empty
- First database initialization can fail in a new installation; it may be required to restart the application to properly initialize the application database
- After configuring a new tenant, you sometimes need to restart the application in order for it to work properly
- When installing BI Reporting from scratch, the "System" tenant doesn't include the "Everyone" group. It has to be manually created and existing users have to be manually added directly in the application DB
- Some charts are not working as intended.

Upgrade Notes

Upgrade is possible from any previous version of BI Reporting for Linux. Upgrading from previous BI Reporting versions is not supported, as they require a manual porting of custom reports.

New Documentation

Created Power Viewer user guide

Created a new user guide for the Power Viewer role, explaining all the role's capabilities and features.

Created new standard report documentation

Created new documentation for the standard reports listed in the first section of these Release Notes.

Updated existing user guides and Management Guide

Clarified the described new features in the appropriate documentation.

BI Reporting 4.1

Version 4.1.0 (11/11/2022)	30
New Features	30
Changed Features	31
Known Issues	31
Upgrade Notes	31
New Documentation	32

Version 4.1.0 (11/11/2022)

New Features

Report view enhancement

New features have been added to report views:

- page format: you can define the page format, size and orientation
- adjust table fields to fit page size: you can force the table content to be automatically stretched in order to fill the page width
- report unit: you can specify the unit of the report view definition (cm, mm, in, in/100)
- Report parameter pre-selection: you can predefine the report parameters (filters and settings) for a report view, defining what a Viewer can interact with
- Background parameters: in a report view, you can set a report filter or setting as a background-parameter; this forces the pre-selected values to be automatically selected and hidden from the Viewer; the parameter is then always applied automatically, as defined in the report view

View editor

A new user interface allows Report Designers to easily create and modify report views. The only feature that is not yet supported by the UI is the report style.

Report view management

A report view can be opened, edited and shared via the standard user interface, the same way as any other report.

Auto-submit report

When default filters are saved, the user can mark the report to be automatically submitted on open, applying the default selection of filters and settings when generating the report.

Split filters & settings when subscribing to a report

Much like the filters and settings are organized in sub-categories in the right-hand pane of the report window, the filters and settings are organized in the same way in the schedule window when a user is scheduling a report.

Standard reports

The following standard reports have been added:

- Agent Wrapup
- Initial skill demand per queue
- Self-service Checkpoint Utilization
- Self-Service Port Utilization
- Self-service Summary

Find out more information about their individual purposes and use in the standard reports documentation.

Changed Features

Features currently disabled

The following features have been disabled in this version of BI Reporting, but should be available in the upcoming releases:

- Connections manager feature
- Custom functions
- Designer debugging
- Mail server configuration UI
- “Shared network file server” support for report scheduling

Known Issues

- Column sorting
- When data are sorted by column, sometimes the user’s default filters and settings are restored
- First chart visualization
- The first time a report is submitted, sometimes charts are shown empty
- First database initialization can fail in a new installation; it may be required to restart the application to properly initialize the application database
- After configuring a new tenant, it is sometimes needed to restart the application in order for it to work properly
- Installing BI Reporting from scratch, “System” tenant doesn’t include the “Everyone” group. It has to be manually created and existing users have to be manually added directly in the application DB

Upgrade Notes

Upgrade is possible from any previous version of BI Reporting for Linux. Upgrading from previous BI Lite versions is not supported, as they require a manual porting of custom reports.

New Documentation

System Administrator documentation

Documentation explaining the user interfaces and actions specific for the System Administrator user.

Updated Management guide

This document is intended for the teams responsible for installing and managing the BI Reporting servers. The document describes how to initialize the system through installation and how to monitor it, how to deal with issues, and how to manage tenants within BI Reporting.

BI Reporting 4.0

Version 4.0.0 (08/05/2022)	33
New Features	33
Changed Features	34
Known Issues	35
Upgrade Notes	35
New Documentation	35

Version 4.0.0 (08/05/2022)

New Features

Multi-tenant support

The system now allows the registration of different tenants within the same BI Reporting instance. Individual users are registered for a specific tenant, and they have access only to the data related to tenant they belong to.

Linux OS Deployment

The BI Reporting system is now deployable to Linux OS environments. Note that Windows OS is not supported for this version of BI Reporting.

Report Viewer and Designer optimizations

Performances of the Data and Report Designer have been improved, as well as those of the Report Viewer.

Standard reports

A standard reports structure is now available to all tenants and their users, where there are premade reports (which can be customized via templates) available for each tenant for use. The data used for the standard reports for each individual tenant is based on each tenant's own private data warehouse and is not share with other tenants. The following standard reports are available:

- Agent Availability
- Agent Interactions
- Agent State
- Interaction Detail
- Queue Interaction Detail
- Queue Performance
- Self Service Checkpoint Utilization

Find out more information about their individual purposes and use in the standard reports documentation.

Report views support

Various templates can be applied to standard reports to create various report views for different tenants, meaning that the same standard report can be displayed differently for individual tenants depending on the template used. A view defines which columns of the standard report are required to be displayed/hidden, or in which order the columns should be displayed. Each tenant can customize the view of the standard report according to their specific needs.

Report view designer

The initial version of the view designer with basic settings for report view definition has been added

Multi-report view support

For the same report, multiple views can be defined

Excel as new report subscription format

Added support for creating custom table relations in data models

New export formats support

Additional export settings have been added during export process

Search in report

Added search feature for searching strings in a report

Variables categorization

Report variables can be categorized in order to organize and visualize them in a better logical way; the categorization supports two levels of grouping: categories and sub-categories.

Standard reports organize variables in "Settings" and "Filters", adding subcategories for grouping levels and time filters.

HA application database

Postgres database is installed in HA master-slave configuration

Administration of tenants

New user interfaces for system admin user have been added to easily configure and manage tenants

Changed Features

Features managed through APIs per tenant or through configuration files

The following features have been excluded from management through the web application UI (typically done by Administrator users through the Admin UI), and were replaced with API management per tenant or are now defined through configuration files:

- Email server setup – now configured in the configuration file
- SSO server setup – now configured per tenant through API

Features currently disabled

The following features have been disabled in this version of BI Reporting, but should be available in the upcoming releases:

- Connections manager feature

- Custom functions
- Designer debugging

Known Issues

- Column sorting
- When data are sorted by column, the user default filters and settings are restored
- First chart visualization
- The first time a report is submitted, charts are shown empty

Upgrade Notes

Upgrade is possible from any previous version of BI Reporting for Linux. Upgrading from previous BI Lite versions is not supported, as they require a manual porting of custom reports.

New Documentation

Standard reports documentation

Documentation explaining the goal and use of the following standard reports is available:

- Agent State
- Agent Interactions
- Queue Performance
- Interaction Detail
- Queue Interaction Detail

CCaaS Management guide

This document is for intended for the CCaaS Hosted Team responsible for monitoring the BI Reporting application and for the BI Team responsible for the configuration of the BI Reporting instances. The document describes how to initialize the system through installation and how to monitor it, how to deal with issues, and how to manage tenants within BI Reporting.

Enghouse BI Lite 3.0.1

Version 3.0.1 (10/12/2021)	36
Features.....	36
Known issues	36
Upgrade notes	36
New documentation	36

Version 3.0.1 (10/12/2021)

Features

Custom table relations

Added support for creating custom table relations in data models

Known issues

No new known issues

Upgrade notes

Upgrade is possible from any earlier release.

New documentation

None

Releases

None

Enghouse BI Lite 3.0

Version 3.0 (02/16/2021)	37
New features.....	37
Bug fixes.....	38
Known issues	38
Upgrade notes.....	39
New documentation	39

Version 3.0 (02/16/2021)

New features

Filtering bookmarks

Possibility of creating and saving various filtering settings for each report, and bookmarking them for quick access later.

Scheduled reports delivery to network file share, or FTP/FTPS/SFTP server

Possibility of configuring scheduled reports delivery to FTP, FTPS, or SFTP server, or to a network file share folder. Email notification about successful file delivery can also be configured.

Login with username

Login possibilities extended to support login with either email or username of the user.

Automatic report refresh

Possibility to configure automatic live refresh of the report while report is being viewed in the browser.

SSO support over OpenID Connect

Possibility to activate and configure SSO integration with OpenID Connect provider. Using KeyCloak as identify provider or user federation. Active Directory credential validation is also supported via KeyCloak.

Import and export improvements for reports and data models

Universally unique id (UUID) introduced for reports and data models which can be included during export, and used on import, and automatically update, existing

report/data models. With this new features updating previously existing reports in the system can be managed automatically resolving also the use of the correct data model.

Import tool - helper tool for importing corporate reports during installation or upgrade

Corporate reports can be imported using the new command-line import tool. It helps installers to easily import reports without the need to access to admin UI. It loads all the data models and reports located in a specified folder, and then applies also connection strings.

Bug fixes

- Column charts do not work when used on Visual reports. Even if they can be added during design, after saving the report, they will disappear.
- Oracle data model can be created and data viewed, but when report is created based on that data model, it is not working. Reports based on Oracle data models are always displayed empty.
- When user is created without password (activation email is sent), but administrator then sets user password before account is activated, user cannot login at all, nor can he activate account (activation token is expired)
- In subscriptions filtering settings, filter of type checkbox, if mandatory, is always required to have value set to “checked”, or it is considered a missing value.
- Application startup is failing if application database is not immediately available.

Known issues

Web browser

- Supported browsers are: Chrome, Firefox 78.0.2 or higher, Edge based on Chromium (79 or higher). Using other web browsers may lead to unpredicted errors

Report or Data model editing

- There is possible loss of changes if two or more users edit same report, or data model at the same time. Only changes from user who saved last are preserved
- Potential overwriting of variables in the query after using “View data” option in the Designer Dictionary
- Variables created by the Data Designer can be deleted by the Designer of the report, but will reappear after the report is reloaded. Designer of the report should not delete variables that were not created by himself.
- PostgreSQL and MySQL databases are not supported.

- Selection of tables to use in Oracle data source when creating a data model is not supported because the generated query will not be syntactically correct. Query must be written manually.
- Reports based on slow database queries, or queries generating large amounts of data can take a long time to render in the browser, and are recommended to be scheduled for delivery through report scheduling.

Upgrade notes

Upgrade is possible from any earlier release.

New documentation

Manual: “Enghouse BI Lite - SSO With KeyCloak And OIDC - v3.0”

Configuration guide made for administrators with that provide instructions for configuring SSO with KeyCloak and Enghouse BI Lite over OpenID Connect

Manual: “Enghouse BI Lite Administrator Manual - v3.0”

Updated to include new features: login with username, OpenID Connect SSO configuration, automatic report refresh global parameters.

Manual: “Enghouse BI Lite Designer Manual - v3.0”

Updated to include new features: reports/data models export/import improvements, login with username.

Manual: “Enghouse BI Lite Viewer Manual - v3.0”

Updated to include new features: filtering bookmarks, login with username, FTP/FTPS/SFTP subscriptions, automatic refresh of the report.

Manual: “Enghouse BI Lite Installation Manual - v3.0”

Version updated

Manual: “Single Sign-On Configuration - v3.0”

Version updated

Manual: “Technical Requirements - v3.0”

Version updated

Manual: “Enghouse BI Lite HTTPS Configuration - v3.0”

Version updated

Releases

None

Enghouse BI Lite 2.1.0

Features list

Custom report filters

Single-select and multi-select dropdowns improved with filtering and autocomplete features

Filtering possibilities extended with nullable boolean type represented as a checkbox

Possibility to save user specific default filtering values for each report

Data designer interface

Added support for Oracle connections

Helper tool for converting DevExpress Reports

Bug fixes

Fixed: In some cases filtering with “Request from user” variables does not work for dashboards in the Designer Preview.

Fixed: Setting of variable default value by expression not working when it is at the same time selected from a column

Fixed: System variable Report Alias not working (printing “Report”)

Known issues

Web browser

Supported browsers are: Chrome, Firefox 78.0.2 or higher, Edge based on Chromium (79 or higher). Using other web browsers may lead to unpredicted errors

Report or Data model editing

There is possible loss of changes if two or more users edit same report, or data model. Only changes from user who saved last are preserved

Possible overwriting of variables in the query after using “View data” option in the Designer Dictionary

Variables created by the Data Designer can be deleted by the Designer of the report, but will reappear after the report is reloaded. Designer of the report should not delete variables that were not created by himself.

Column charts do not work when used on Visual reports. Even if they can be added during design, after saving the report, they will disappear.

Enghouse BI Lite 2.0.0

Features list

User management

- Username field made available for security filtering during data model design
- Single Sign-On via JWT

Data designer interface

- Custom JavaScript functions feature that can be used during data model design

Reports user interface

- Custom JavaScript functions feature that can be used during report design
- Debugging information made available for the designer during report design
- “Created by me” filter on the main reports and data models page
- Import of corporate reports from a file
- Option to choose the folder where reports will be imported
- List of corporate reports in a separate tab in the sidebar
- Corporate reports locked for changing their contents
- Internationalization of number and date formats in reports for supported languages
- Removed Data design and report design permissions from Administrator role

Custom report filters

- Filtering possibilities extended with single-select and multi-select dropdowns for numbers and text)
- Filtering possibilities extended with different time frame options (Years, Quarters, Months, Weeks, Days, Hours) and corresponding sub-options

Other

- License is now required during installation
- Updated PostgreSQL installer from v12.0.1 to v12.3.1

Documentation

- Added Apache Server and Nginx Server to HTTPS configuration document
- Single Sign-On configuration

Known issues

Web browser

Currently only Google Chrome is supported, using other web browsers may lead to unpredicted errors

Report or Data model editing

There is possible loss of changes if two or more users edit same report, or data model. Only changes from user who saved last are preserved

Possible overwriting of variables in the query after using “View data” option in the Designer Dictionary

Variables created by the Data Designer can be deleted by the Designer of the report, but will reappear after the report is reloaded. Designer of the report should not delete variables that were not created by himself.

In some cases filtering with “Request from user” variables does not work for dashboards in the Designer Preview

Enghouse BI Lite 0.2.0-alpha

For internal use only

Features list

User management

Roles: Data Designer role introduced

Data designer interface

Interface for designing data connections and data models

Data models sharing with other users or groups with access level modifier

Sortable, and searchable list of existing data models

Data models duplication

Exporting data models to file

Importing data models from file

Reports user interface

Creation of reports based on a predefined Data model

Restricting access to data model queries and connections details for the report Designer

Download of report in various formats (Pdf, Docx, Xlsx, Pptx, Csv, Mrt, Odt, Ods, Mdc, Html)

Scheduling regular report delivery to a list of emails with configurable filtering

Marking and filtering of favorite reports

Exporting reports to file

Importing reports from file

Administrator settings interface

Global parameters settings: users session timeout, first day of the week

Custom report filters

Range filtering supported for Date, and Date time filters (today, yesterday, this week, last week)

Keyword “_OPTIONAL_” introduced for enabling non-required text filters

Support for localization

User languages introduced: German, Spanish, Italian, Portuguese, French

Known issues

Web browser

Currently only Google Chrome is supported, using other web browsers may lead to unpredicted errors

Report or Data model editing

There is possible loss of changes if two or more users edit same report, or data model. Only changes from user who saved last are preserved

Possible overwriting of variables in the query after using “View data” option in the Designer Dictionary

Variables created by the Data Designer can be deleted by the Designer of the report, but will reappear after the report is reloaded. Designer of the report should not delete variables that were not created by himself.

Enghouse BI Lite 0.1.0-alpha

For internal use only

Features list

User management

Roles: Administrator, Designer and Viewer

Change and reset password

User account lockout after set number of failed attempts

Email notifications for confirming email address, resetting password, etc.

Reports user interface

Reports sharing with other users or groups with access modifier

Reports designer and viewer

Report duplication

Importing of existing report from file

Sortable list of created reports

Download of report in PDF format with applied custom filters

Data security based on user ID

Administrator settings interface

Application users overview

Add, edit or delete application users

Add, edit or delete group of users

Email server settings

License settings

Custom report filters

Supported data types: Date, Date time, number and string

Folder tree layout

Overview of report information

Licensing

Named designers

Management over web application after installation

Support for localization (only English)

Helper tool for converting Crystal Reports

Known issues

Web browser

Currently only Google Chrome is supported, using other web browsers may lead to unpredicted errors

Report editing

There is possible loss of changes if two or more users edit same report, only changes from user who saved last are preserved

Dashboard designing

When designing a dashboard rendering is sometimes slow