

Qlik Sense September 2019

Release notes

Published: October 16, 2019

TABLE OF CONTENTS

What's new in Sense September 2019	2
Resolved issues	2
Known issues and limitations	9
Upgrade notes	15
Deprecated functionality	19
Installing and removing Qlik Sense Extension bundles from a Qlik Sense installation	20
Change in privilege requirements for publishing apps from QMC	20
BNF script reload mode	21
Search history in smart search	21
New security properties for the Qlik REST Connector	21
Translation of Bar Chart changed for French and Traditional Chinese	22
System requirements notes	22

The following release notes cover the versions of Qlik Sense Enterprise on Windows and Qlik Sense Enterprise on Kubernetes released in September 2019.

This document covers the following releases:

Qlik Sense September 2019

Release: September 30, 2019

What's new in Sense September 2019

Please refer to the What's new sections of the online help for information about the new and updated features of the Qlik Sense Enterprise on Windows September 2019 release:

[What's new in Qlik Sense September 2019](#)

[What's new in Qlik Sense September 2019 \(Developers\)](#)

Setting a default bookmark to create an app landing page

With Qlik Sense September 2019, you can select a sheet to be the landing page of your app by setting a default bookmark. This new feature might cause an unexpected behavior if you have previously configured the setting "Set selections as app default". For more information, see "Setting a sheet as the app landing page" in the Upgrade notes section.

Resolved issues

Qlik Sense September 2019 comes with fixes for the issues described below.

September 2019

Data Market weather data is not refreshing for few cities

Jira issue ID: DS-2808

Description: Weather data on a few cities was missing from the weather source.

ConnectionStringEditor not saving when using characters needing escaping

Jira issue ID: QLIK-82325

Description: In QlikSenseUtil > ConnectionStringEditor, when you attempt to save the file with a character that needs escaping (" , ' & , < , >), the tool does not save the changes or warn why it is not saving the changes.

Wrong owner of ODAG app

Jira issue ID: QLIK-91121

Description: When an on-demand app is generated, the owner of the app is set to the user who created the ODAG link. The owner of ODAG generated apps are now set to the user requesting the app generation instead of the link creator.

ODAG Links are not deleted (soft or hard) when App is deleted

Jira issue ID: QLIK-93120

Description: ODAG link name can now be reused, if the app using the link has been deleted without first deleting the link.

Wrap text issue in straight table

Jira issue ID: QLIK-93399

Description: Straight Table extension did not respect turning of "Wrap text in headers" and "Wrap text in cells" settings.

[Session Start] and [Session End] timestamps not aligned to same timezone in "Session Details" sheet of Operations Monitor and Session Monitor apps

Jira issue ID: QLIK-93738

Description: Inconsistent application of timezone offsets in the session_engine log result in [Session Start] and [Session End] timestamps appearing out of order in the Operations Monitor and Session Monitor apps. Fix was to apply proper timestamp conversion to these fields in the apps.

Inline JavaScript in the index.html causes the Hub to be blocked by Content Security Policy (CSP) header

Jira issue ID: QLIK-94212

Description: To allow a more comprehensive Content Security Policy to be set, remove Inline JavaScript code from page.

Fail to find first keyword in DB keyword search

Jira issue ID: QLIK-94248

Description: In order to limit the number of rows fetched in a preview, users search for specific keywords in a list of keywords fetched from the database driver. If the keyword we are looking for is the first word in this list, the keyword is not found and users select all rows in the table instead of only a few rows.

Set Default view for map does not persist when importing into new environment

Jira issue ID: QLIK-94345

Description: Map auto zoom does not persist when importing it to the QMC.

Master measure label update issue

Jira issue ID: QLIK-94458

Description: Master measures label expression do not get updated without a full-page refresh if the app is already opened while the reloads occurs.

Set expression displays blank for published Sheet

Jira issue ID: QLIK-94488

Description: Set expression shows blanks for derived calendar fields under special circumstances. This problem has been corrected so the set expression displays the correct result as expected.

Duplicated apps from other owners do not show Data load editor or Data Manager options

Jira issue ID: QLIK-94550

Description: If an app is duplicated with no script available (because of access rules) we insert empty script already at duplication.

Licenses service does not use the configuration in SCHANNEL to restrict the security protocols used

Jira issue ID: QLIK-95026

Description: The licenses.exe service used security protocols that was disabled in the SCHANNEL configuration. Now the licenses.exe uses the security protocol configuration of the SCHANNEL. This only applies to Windows deployments.

Cannot add more than 16 dimensions using chart suggestions

Jira issue ID: QLIK-95182

Description: The auto-chart was not accepting more than 15 dimensions (or measures) into the straight table, even though the auto-chart supported it. This is now fixed.

Prevent Attaching one LibItem to multiple fields in the Precedent graph

Jira issue ID: QLIK-95551

Description: Precedent service graph will not allow attaching LibItem to multiple fields.

Update jQuery

Jira issue ID: QLIK-95556

Description: Qlik Sense hub upgraded to use jQuery 3.4.0.

Session still inactive after claimed ticket

Jira issue ID: QLIK-95638

Description: When calling /qps/ticket to get a ticket, and then using it within 60 seconds to call /qps/user?qlikTicket=<ticket>, client would get "Session: inactive" in response. With the fix response with a Set-Cookie header and an active session is returned from QPS.

Optimization for allowing table linking (Association) for relatively medium to big data models

Jira issue ID: QLIK-95665

Description: Improved/optimized bottleneck code to allows linking (Association) process to kick in for medium to big size app.

NPrinting OnDemand extension limited to first 50 Apps

Jira issue ID: QLIK-95688

Description: The limit for 50 apps has been removed by this fix which looks at how many NPrinting apps there are on the NPrinting server and requests all of them (100 per request) to make sure none is missed. This fix does the same for connections and reports.

"These Position" button grayed out while splitting the column data

Jira issue ID: QLIK-95735

Description: Using Qlik Sense Data Manager to split a column of data using the Split Card. However, "These Position" button remain grayed out.

Selections from default state incorrectly applied to alternate state P&L pivot

Jira issue ID: QLIK-95802

Description: In apps with alternate state applied to a P&L pivot table, the P&L table is updated also when making selections in default state, while it should be updated only when making selections in alternate state.

Button for Navigation shown as 404 Not Found in published mashup

Jira issue ID: QLIK-95906

Description: When publishing a mashup that displays a Button for Navigation object, the button does not load, and the browser developer tools shows a 404 error with files associated with the extension.

P&L pivot does not render as expected (App theme: Sense Focus)

Jira issue ID: QLIK-95962

Description: P&L pivot does not work as expected when the selected App theme is: Sense Focus. This is now fixed.

Qlik Sense services not started on Windows Server 2012 R2

Jira issue ID: QLIK-96005

Description: After installing Qlik Sense on Windows Server 2012 R2 some of the services are not started, for example: AppDistributionService, QseEventProcessor, EntitlementProvisioningService, HybridDeploymentService. See the dedicated article [here](#).

X Axis set as Duration not working

Jira issue ID: QLIK-96025

Description: Fixed Box plot and Distribution plot not working when using a measure formatted as duration.

Missing tooltip in Scatter Plot

Jira issue ID: QLIK-96073

Description: When panning in a scatter plot a user would in some circumstances not be able to get tooltips while hovering over dots.

Donut chart not showing the values for the measure

Jira issue ID: QLIK-96101

Description: After upgrading to Qlik Sense February 2019, the Donut chart stops showing the values for the measure.

Message from Web page: [Leave this page] and [Stay on this page] shown when using IE11

Jira issue ID: QLIK-96109

Description: After upgrading from to Qlik Sense April 2019, if a user access a Sense hub using Microsoft IE11, opens an app, and closes it, a pop-up message is shown with the following text: "Are you sure you want to leave this page? Message from Web page" providing the options [Leave this page] [Stay on this page].

MultiKPI Range-Selections does not work in April 2019

Jira issue ID: QLIK-96142

Description: MultiKPI Range-Selections stopped working in release April 2019. With this fix, the Range selections in MultiKPI works as expected.

Long variable definitions

Jira issue ID: QLIK-96165

Description: If adding a variable with a long definition the user would be unable to edit that definition later inside the client.

Share Button generates URL without virtual proxy prefix

Jira issue ID: QLIK-96168

Description: When using a virtual proxy, an app that makes use of the share button generates a URL that is missing the virtual proxy prefix.

Opening of newly created apps in parallel can cause duplication issues in the theme properties

Jira issue ID: QLIK-96200

Description: When opening a newly created app multiple times in parallel this would cause multiple themes to be stored. In duplication this could lead to errors in copying the correct (current) theme. This fix will make sure only one theme will be able to be stored at the same time.

Stored Cross-Site Scripting (XSS) vulnerability in Stories

Jira issue ID: QLIK-96209

Description: A possible Cross-Site Scripting (XSS) existed in the Stories feature. This is now fixed. The fix was also included in the following releases: Qlik Sense June 2019 (initial release), Qlik Sense April 2019 Patch 1, Qlik Sense February 2019 Patch 4, Qlik Sense November 2018 Patch 6.

Multi KPI does not have conditional formatting option

Jira issue ID: QLIK-96228

Description: Conditional coloring for measures not enabled in Multi KPI. With this fix, the extension Multi KPI has been updated to enable conditional formatting for measures.

QMC does not update Rim node's status after the network is reconnected

Jira issue ID: QLIK-96244

Description: In multiple nodes environment, after disconnecting the network connection between central node and rim node, then reconnecting the network, the rim node's status still shows offline in QMC. During this period, all Qlik Sense services on rim node remain up running.

Expression is not working properly in Line Chart with Color

Jira issue ID: QLIK-96303

Description: Fixed an issue with Total measures getting broken when color by dimension used on some visualizations (Line chart and Stacked Bar chart).

Date Picker Extension doesn't work on calculated field

Jira issue ID: QLIK-96312

Description: Date picker extension cannot be used on a calculated field. With this fix, the Date Picker extension has been updated to work with calculated fields.

Excessive /qrs/license/requestaccesstype calls with capacity-based license

Jira issue ID: QLIK-96326

Description: With capacity-based license proxy service would make excessive calls to /qrs/license/requestaccesstype when evaluating access type

Spaces in database password causing InternalServerError

Jira issue ID: QLIK-96329

Description: The Qlik License Service does not support spaces in database password. The Qlik License Service uses the same user as the repository service to contact the database. If the password for that user contains special characters, licenses wont function properly.

Share Button not applying dynamic selections from app standard bookmark

Jira issue ID: QLIK-96367

Description: The app standard bookmark selects dynamically the current year -2 and month -1 when opening the app. When making an additional selection (like Product) and pressing the copy link button on the share button extension in the dashboard bundle, only the product selection is applied.

[Geo] Line layer of Map object get error when the Internet connection is not available

Jira issue ID: QLIK-96386

Description: When the Internet connection is not available, a user receives an error message "Cannot connect to the location server. Check your internet connection and try again." for both Point layer and Line layer in Edit mode.

Formatting issues when exporting a story to ppt format

Jira issue ID: QLIK-96468

Description: When a story is exported to PPT, a chart in a sheet is reproduced repeatedly, overlapping the chart in the following sheet.

Fixed Auto-chart for maps

Jira issue ID: QLIK-96497

Description: The condition checking problem was resulting map in Auto-charts, shows as an empty layer(no data).

KPI Objects inconsistent with selections in exported Story live data sheet

Jira issue ID: QLIK-96511

Description: Exporting stories with embedded sheets sometimes leads to incorrectly applied selections in the exported slides.

Qlik Sense Operations Not capturing export to CSV activity information

Jira issue ID: QLIK-96596

Description: When exporting to CSV in a Mashup (meaning, using the CSV_C or CSV_T formats rather than the OOXML format), the operations monitor app (and likely any other app which parses data exports) does not appropriately count the export operation.

Distribution plot missing when exported from a story

Jira issue ID: QLIK-96634

Description: Distribution plot occasionally is not shown when exported from a story to PPT or PDF.

Qlik Sense: 'Cannot add additional response header (...) since a header with that name is already set' errors in Audit_Proxy logs

Jira issue ID: QLIK-96636

Description: The additional response-headers were cached and then unnecessarily added on every request resulting in *Audit_Proxy* logs being polluted with 'Cannot add additional response header' errors. With this fix, only the original response-headers are cached.

Sense Installer fails to create a database schema on Azure

Jira issue ID: QLIK-96646

Description: Sense Installer fails to create a database schema on Azure with ERROR: role "qliksenserepository@xxx" does not exist.

Labels cut in color legend

Jira issue ID: QLIK-96657

Description: Fixed issue where long labels in the color legend could get cut without an ellipsis being added.

Request for same behavior for buttons between QMC and table objects in apps

Jira issue ID: QLIK-96707

Description: Correct icon visuals for sorting lists.

Fields created using Inline load are not highlighted in the Script or Expression Editors

Jira issue ID: QLIK-96730

Description: In Qlik Sense June 2019, fields created using Inline load are not highlighted in the Script or Expression Editors. The calculations for those fields is correct.

Unable to create rule for Analyzer Capacity based license in QMC

Jira issue ID: QLIK-96864

Description: If a license did not have any Analyzer passes, the section would not display in the QMC. Users were unable to create a Security rule for the users using the Analyzer Time.

Unable to "resize column" in P&L Pivot Object

Jira issue ID: QLIK-97077

Description: The option to change the column width in P&L pivot did not work as expected. The extension P&L pivot has been updated so now the option to change the width works as expected and user can resize the columns.

"Export app without data" does not contain sheets

Jira issue ID: QLIK-97474

Description: In Qlik Sense June 2019, when exporting an app without data from the Qlik Management Console (QMC), the app is exported without any sheet.

PostgreSQL connector fails when using option "Full path of Trusted Certificate" with PEM file

Jira issue ID: QVXODBC-1539

Enable unit test TestAccessToTableDataWithoutPermission for Redshift

Jira issue ID: QVXODBC-1712

"Query timeout" parameter has no effect in Qlik ODBC connector package

Jira issue ID: QVXODBC-1751

Description: When a connection to an ODBC data source takes more than 30 seconds to establish it expires even though "Query timeout" parameter is set to a higher value.

Note: This fix is to utilize the value from Query timeout parameter when making a connection.

Known issues and limitations

The following issues and limitations were identified at release time. The list is not comprehensive; it does however list all known major issues and limitations.

Clients

- If you have an object inside the container with a show condition that evaluates to false you are not able to edit properties of this object.

Workaround:

- Option One: Make sure your show condition evaluates to true. Either by triggering an action/selection so that your show condition evaluates to true, or temporary remove the show condition. Now you can edit properties of the object inside the container.
- Option Two: If you use master items inside the container you could edit the properties of the master item and it would propagate to the master item inside the container.
- Option Three: Comment the expression that defines the condition, by entering two slashes in front of the equals sign, e.g. `//=Count(Customer) <= 2`
- Third-party extensions are currently not supported on mobile devices, and the Qlik Trusted Extension Developer program does not accredit extensions for use on mobile devices. Depending on individual device specifications, mobile OS, and size of the Qlik Sense app, items generated using a third-party extension might fail to be visualized properly on a mobile device.
- Calculated dimensions is not supported by NPrinting when generating reports.
- When consuming Qlik Sense apps using Microsoft Edge browser, touch screen mode is activated by default even when it is run on a non-touch device.

Workaround: turn 'touch screen mode' off from the navigation menu.

- When consuming Qlik Sense apps using Microsoft Edge browser on touch/hybrid devices, the long-press action does not work. This limitation prevents from accessing functions such as an object's context menu, which on touch mode requires a long-press. This is a Microsoft Edge's issue.

Workaround: if using an hybrid device, turn the touch mode off and turn it back on again.

- In Qlik Sense February 2019 or later, the Date Range Picker extension allows for a maximum of 10.000 date selections. In Qlik Sense November 2018, the limit was 5.000 selections. To use the new limit of 10.000 selections, you must delete any Date Range Picker created with previous releases (Sense November 2018 and relative patches) and create a new date picker object in Sense February 2019.
- When using a wildcard with selectmatch, the selection is found but the selection is not rendered on a chart.
- Column values swapped in a table.
- When selecting excluded values, the associated values are also cleared.
- Alternate states are not supported for Qlik Sense Mobile.
- Export as Anonymous does not work for mashups deployed in a domain that is different from the domain in which Qlik Sense is installed. Export only works for Anonymous if the mashup is deployed in the same domain as Qlik Sense.
- When changes are made to sheets in Qlik Sense Desktop, some unspecified changes are sometimes also made. Most often happens when drawing objects.
- Cannot add a deep link to a text and image object. For example, the following link does not work: `qliksenselink://rd-bda-deep1.rdlund.qliktech.com/windows/sense/app/28637e5c-ec17-44b2-bd52-03ecf79d7c29/sheet/4b040373-1a3b-44ca-926c-3c43d4155e33/state/analysis`
- When using the new "Load Extension" syntax in the load script, the **Data load editor** syntax completion does not work well after the keyword "Extension" when trying to write the call to an SSE function (AAI function). Nevertheless, the script executes correctly.

- Connecting to a web page through a web file fails in **Data load editor**.
Workaround: Open Settings.ini file and change "WebFileUseWinAPI = 0" to "WebFileUseWinAPI = 1".
- Creating and editing of On-demand app navigation links on published apps is not currently supported.
- Legend does not show dimension values that are after row number 3000.
- The Exists function now requires the field_name to be loaded before its values are evaluated with the exists function. If the field_name you are evaluating is not yet loaded, you will receive a script error. The previous behavior was that the function returned neither TRUE nor FALSE, but NULL instead, so the result was dependent on the NULL handling of the surrounding context/expressions.
Workaround: Use FieldNumber('field ') to check the existence of the field before you use the field in an Exists.
- Coloring does not work for alternative dimensions in Qlik Sense 3.1 and later. The color is grayed out.
- Color schemes on charts with multiple measures, such as bar charts, that use the Multicolored setting cannot be changed.
- Exporting a chart as an image, using a DPI setting different from the default, may result in an unexpected output.
- If using the on-screen touch keyboard within the Add Data Wizard in docked mode on a Windows Tablet, the keyboard may cover much of the screen making it impossible to edit.
Workaround: Use the keyboard in standard mode (not docked).
- Moving sheets with the mouse is not supported for hybrid devices with Internet Explorer or Edge.
- It might not be possible to scroll to the beginning or to the end in the Expression editor when using an Android tablet.
- If running Qlik Sense on a Nexus 5 phone using Google Chrome version 41, input fields will not work as expected.
Workaround: Fixed in later version, so use Google Chrome version 55.
- On iPhone, it is not possible to use the toolbar in landscape because the iOS user interface covers/hides it.
- Generation of the test script by pressing Ctrl+00 does not work in Qlik Sense Desktop environment when using Google Chrome or the Qlik Browser on hybrid devices.
Workaround: Launch Qlik Sense Desktop in Internet Explorer.
- Maps may take a long time to display if the association between the first dimension and the geographical field results in a large number of items.
- Internet Explorer supports a maximum of six web socket connections.
Workaround: See [https://msdn.microsoft.com/library/ee330736\(v=vs.85\).aspx](https://msdn.microsoft.com/library/ee330736(v=vs.85).aspx)
- If you convert an existing visualization to another type of visualization, the thumbnail in the App overview may not be updated to depict the new visualization type.
- It is not possible to upload more than one image file at a time from a device running iOS 8.
- You need to enter username and password to download an Export image/pdf on Windows phone devices
- If dimension limits (others) is set in a straight table or Pivot table, the subtotals and totals are incorrectly calculated.
- Exporting a story to PowerPoint limitations:
 - Titles are not rescaled as HTML, font settings are not yet exported.
 - Storytelling effects are not applied.
 - Exported charts may show fixed scroll bars, depending on the export resolution.
- It is not possible to pivot dimensions in a Pivot table on devices using IOS 8.4.1.
- If you select data from web files with UTF-8 decoding and non-ASCII characters in the caption, data may be garbled.
- In Data manager, date and timestamp field classification is disabled If the table is a result of concatenation of two or more tables.
- It is not possible to select values in the search box of filter panes that are set to select one and only one field value.
- It's not possible to insert breakpoints in the data load editor on an iPad, as tapping the line number activates the virtual keyboard.
- The hub doesn't work properly when using Internet Explorer 11 and IPv6.

- Due to a degrade introduced in Mozilla Firefox versions 52 and 53, those versions are not supported to use together with Qlik Sense 3.2 SR1 or later.
- Generating a new on-demand app – or reloading with new selections – may fail with "Payload too large" error if the overall number of selected values on bound fields is very large (i.e. many hundreds of distinct values).

Multi-node

- Multi-node only synchronizes log files when they roll from .txt to .log files. The monitor apps will not receive the data before the log has rolled.
- You may not be able to connect to a RIM node if the usage of FIPS compliant algorithms has been enabled on that RIM node.

Globalization

- Some Operating Systems have not been updated with the new Russian currency symbol. Apps created in Qlik Sense installed on an Operating System that has the updated currency symbol will show as square or scrambled when the app is opened on an Operating System that does not have the updated currency symbol.
- When creating a web-file connection, Qlik Sense cannot decode UTF-8 tables with non-ASCII characters in the caption.
- When using Internet Explorer or Chrome, and if the App name is defined with Japanese characters, you may experience the app name on browser tab being defined with Chinese characters.
- When having PC locale as Turkish, the currency symbol for Lira might be displayed as a square in the Data Load Editor instead of the actual currency symbol.

Workaround: Set the monospace font in the browser.

- The use of Chinese, Japanese and Korean input methods in the data load editor and extension editor might not behave entirely as expected.

Workaround: Should you run into any difficulty, you can always use a desktop editor, and copy/paste into the data load editor or extension editor.

Managing a Qlik Sense site

- If you set up your REST data connections with a regular user account and not a service account (not meaning Qlik Sense internal service accounts, but an AD/LDAP/other user directory service account), the maximum number of parallel sessions for a single user account (5) will be consumed, and the user will be locked out.
Workaround: Use a service account instead, and do not allocate any user/professional/analyzer access to that account.
- The QMC Custom Property Edit page can currently handle a limited number of custom properties. If you want to edit custom property values in the QMC, we recommend keeping the amount of custom property values to a maximum of 500. If you want to just apply values without modifying them, the QMC can handle up to 10.000 custom property values.
- The Qlik Logging Service handles communication outages with PostgreSQL by retrying three times to establish the connection and displays an error if unsuccessful. Communication outages with PostgreSQL can occur for a number of reasons and are not always recoverable in the limited time window of three tries.
- If you change the name of an unpublished app that is currently open in the Hub from the QMC or by using the QRS API, the new app name will not be visible until the Hub is refreshed and some errors may occur in the log.
- If you create your own Content library, the images imported to that library will not be visible when choosing an image for Story, App or Text & Image.
- If several apps with a large number of objects are imported at the same time, the import operations may fail due to timeout issues between the repository service and the database.

Workaround: Stop all services, change the setting of `seq_page_cost` to 2.0 in the PostgreSQL configuration file (`postgresql.conf`), and restart the services.

- If you want to use a sorting in the QMC that is different than the regional setting, you must create a new user account with the desired regional setting before installing the QMC. After installation, you cannot change sorting by changing regional setting.
- Users and groups in an environment with nested groups spread over different domains do not get synchronized.
- “Next execution” time will not be updated to show correct time if the time was altered under Date&Time on the server machine.

Workaround: If the time is changed on server machine, restart the Scheduler service.

Qlik Sense APIs

- If you add a dimension by dragging and dropping it onto the Horizontal listbox visualization extension example, or any other custom visualization extensions based on a ListObject, you may receive a *Replace invalid dimension* error message.

Workaround: Use the Add dimension button inside the visualization extension instead.

- Using the .NET SDK `importApp` method will not trigger any migration of the imported app. Apps imported with the `importApp` method will not be displayed in the hub and cannot be opened.

Workarounds:

- Migrate the app to the correct version in a Qlik Sense Desktop environment before importing it to a server installation.
- Trigger a manual migration in the QMC of the app that was imported with the .NET SDK `importApp` method. Alternatively, use the REST API.

Installation

- In Qlik Sense February 2019 or later, a new License Service component is delivered together with Qlik Sense. This service is used when the signed keys are used for product activations. This activation process is required for Multi Cloud deployments using Qlik Sense Enterprise on Kubernetes or Qlik Sense Enterprise on Cloud Services as deployment methods. The new activation process is also required to use the Analyzer Capacity license introduced with Qlik Sense February 2019. For more information, see “New product activation method using the License Service component for Qlik Sense February 2019 and later” in the “Upgrade notes” section of this document.

Workaround: Use the standard key with a serial and a control number product activation instead of the signed key method. To use the standard key activation method, you must run Qlik Sense November 2018 in your Multi-Cloud installation.

- After installing or upgrading to Qlik Sense February 2019, 'License management' section in QMC might not be showing all its subsections. The 'Site license' section might not present the user with the ability of switching between LEF ('Use serial number and control number') and signed-key ('Use signed license key') based licenses.

Workaround: To resolve that state refresh QMC, restart your browser, or restart all the services.

- In Qlik Sense November 2018 it is not possible to install Qlik Sense Extension bundles through a silent installation. Qlik Sense Extension bundles can only be installed via the regular install procedure, or separately, once Qlik Sense November 2018 is installed. To install Qlik Sense Extension bundles separately, see “Installing and removing Qlik Sense Extension bundles from a Qlik Sense installation” in this document.

Workaround: If you are installing Qlik Sense November 2018 by performing a silent installation, install Qlik Sense Extension bundles separately at a later moment.

- If an invalid superuser password is entered, a validation error message is shown after the installation process is complete.

Qlik Sense Desktop

- Qlik Sense Desktop does not support SAML-based authentication with an OKTA identity provider or more generally any identity provider that relies upon subresource integrity. See also: [Subresource Integrity](#).
- Export as an image and Export to PDF will not work from Qlik Sense Desktop if you have Qlik Sense (server) installed on the same machine.
- In Qlik Sense Desktop, you have access to the Basic data only through Qlik DataMarket. To access other data packages, you have to purchase a license key.
- Sorting by expression in a Pivot table may not work as expected.
- When opening Qlik Sense Desktop, the Welcome message may be displayed even though it has previously been selected not to display the message again.
- The first time Qlik Sense Desktop is started, a security alert may be shown regarding Evented I/O for V8 JavaScript and dataprepservice.exe.
- Adding desktop authentication links from the enterprise hub will not work if the following conditions are met at the same time:
 - You are logged in as the built-in administrator in Windows 10.
 - Qlik Sense Desktop is not running in the background.
 - You are using Google Chrome or Mozilla Firefox to click the desktop authentication link.

Workaround: To make the authentication link work when you are logged in as built in administrator you have to do the following:

1. Navigate to your local security policy on your Windows 10 workstation.
2. Under Local Policies/Security Options navigate to “User Account Control Admin Approval Mode for the Built-in Administrator Account “
3. Set the policy to Enabled.
4. Restart computer.

Connectors

- In a Qlik Sense Enterprise on Kubernetes installation, if while loading a file using the Amazon S3 connector you attempt to abort the load, the abort is not effective and the file keeps loading in the background although it might look like it has been successfully aborted.
- REST connector: After upgrading from version 1.7 or previous, to version 2.6 or later, the connector panel is not loaded and you cannot load data from any apps. This issue only appears if you used a custom directory instead of the default location during your initial install of the connector. To solve this, do the following:
 - Download and run installer for version 2.15 (June 2019).
 - Click Upgrade and follow the rest of the upgrade procedure.
 - Run the installer a second time. Select the repair option.
 - Click Repair.
- REST connector: The Next token pagination option does not work when the pagination token has the same value for each page.
- For connectors in the ODBC Connectors Package, only the data types listed as supported in the online help have been verified to work correctly in the Preview and Script editor. However, ODBC Connector Package does not prevent the loading of other data types, so in some cases unsupported data types can be loaded with the load script.
- Google BigQuery Connector in ODBC Connector Package: If a user selects Standard SQL as a Language dialect in the **Create connection** dialog, queries written or views created using Legacy SQL dialect will not work.
- DataMarket connector: Numbers may be loaded as strings if the locale has ‘,’ (comma) set as decimal separator.
- DataMarket connector: When upgrading Qlik Sense Desktop from version 2.2 or earlier to version 3.x, Qlik DataMarket may function incorrectly.

Workaround: Repair the installation using Control Panel/Programs/Programs and Features/Qlik Sense Desktop/Change/Repair.

- EssBase connector: The EssBase connector is not compatible with the SAP BEX connector 6.3.0.

Workaround: Upgrade the SAP BEX connector to version 6.3.2.

- ODBC connector: If the user name on the Microsoft Windows system running Qlik Sense Desktop contains letters that are not English alphanumeric characters, database connectors in the ODBC Connector Package do not work properly.

Workaround: Change the Windows system locale to the match the character set that contains the characters used in the user name. For example, if the System locale on the system running Qlik Sense Desktop is set to English and a user name contains Swedish characters, the System locale setting must be changed to Swedish for the ODBC connector to work properly.

- The Qlik Salesforce Connector does not support PK chunking on sharing objects. PK chunking is supported only on parent objects.

Cloud deployments and Multi-Cloud

- In Qlik Sense Enterprise on Kubernetes or Qlik Sense Enterprise on Cloud Services, when exporting data from a generic object using ExportData, the user receives Access Denied error.
- If you change the name of an app and publish it again, the new name is correctly visualized in the hub, but the old name is shown once the app is open.
- When connecting to a remote MongoDB in a Qlik Sense Enterprise on Kubernetes installation, the service fails to start if SSL is not enabled for the MongoDB instance. This happens because some services assume that SSL is enabled in MongoDB by default.

Workaround: It is always recommended having SSL enabled in database connection. When this is not an option, you can disable ssl support by adding `?ssl=false` to the end of the connection URI. A more consistent and lower maintenance option is using the DNS Seedlist format connection string. For more information, see the “DNS Connection Format” section in the following MongoDB documentation: Connection string URI Format.

- It is not possible to upload extension containing QVF files in Qlik Sense Enterprise on Kubernetes environments. If an extension contains a QVF file, the upload to Qlik Sense Enterprise on Kubernetes fails.
- In a Qlik Sense Enterprise on Kubernetes installation, if while loading a file using the Amazon S3 connector you attempt to abort the load, the abort will appear successful but the connector may continue the load using pod resources.
- When downloading a pivot table in cloud environments (Qlik Sense Enterprise on Cloud Services and Qlik Sense Enterprise on Kubernetes), expanded rows are not included but stay collapsed.
- A Qlik Sense Enterprise with Multi-Cloud environment can currently include only one Qlik Sense Enterprise for Windows deployment connected to Qlik Sense Enterprise for elastic deployments and/or Qlik Cloud Services (QCS).
- Collections with names that are more than 150 characters long are not properly displayed in the cloud hub. In a Qlik Sense Enterprise hub (Windows deployment), collection values (in the custom property) can contain up to 256 characters.

Workaround: make sure that app collections you want to distribute from Qlik Sense Enterprise for Windows to the multi-cloud environment have values with no more than 150 characters.

- In a Qlik Sense Enterprise with Multi-Cloud environment, if you delete apps included in a collection that has been previously distributed to the cloud environment, (QSE for elastic deployments and/or QCS), the collection remains visible in the cloud hub, though it is empty.

Workaround: the Qlik Sense administrator must manually delete the empty collection.

- If you try to access the Multi-Cloud Setup Console without read access on license information, an error message appears stating: “Failed to read the license. The Qlik Sense Repository service returned an unexpected error.”

Workaround: access the Multi-Cloud Setup Console once you are granted rootAdmin rights.

EMM solutions for Qlik Sense Enterprise

- If you use BlackBerry Access to consume Qlik Sense Enterprise apps, the Access browser does not display <Title> information. This means that when opening a Qlik Sense app through BlackBerry Access, the app retains the title of the initial Tab instead of showing the App Name.
Workaround: refresh the browser so to display the correct App title.
- If using BlackBerry Access instead on Qlik Sense Mobile app, the access browser does not provide any indication in case of loss of connection with Qlik Sense Enterprise. If trying to interact with a Sense App after the connection is lost, the app becomes unavailable.
Workaround: refresh the browser so to trigger a new log-in request.
- If using BlackBerry Access, when a Qlik Sense Enterprise log-in session expires, the Access browser provides an error message stating that the content is no longer available. In such a case using the refresh button does not trigger a refresh, but it only closes the error message.
Workaround: close the tab and access again Qlik Sense Enterprise from the link in the BlackBerry Dynamic environment.
- VMWare browser: session lost but refresh functionality not visible in browser.
Workaround: Click the browser's Home button or restart the browser.
- When using the AirWatch browser to access Qlik Sense Enterprise, the refresh causes the content to be displayed in portrait mode even when the device is in landscape mode.
Workaround: rotate the device so that the correct orientation is detected.
- When using the AirWatch browser to access Qlik Sense Enterprise, the header of the browser shows the Server name, occupying more space than needed especially in Landscape mode.

Upgrade notes

Setting a sheet as the app landing page

With Qlik Sense September 2019, you can select a sheet to be the landing page of your app by setting a default bookmark. If in a app you had previously configured the setting “Set selections as app default”, the document will now open on the sheet where you have applied the setting instead of opening on the sheet overview. To change this behavior, do the following:

1. Open the app where the “Set selections as app default” setting is applied.
2. Go to the sheet you want to use as the app's landing page.
3. Open the Bookmarks
4. Create a new bookmark
5. Right click on the newly created bookmark
6. Choose 'Set as default bookmark'
7. Repeat this procedure for all apps where the “Set selections as app default” setting is applied.

For more information on this feature, see the documentation page [Setting a default bookmark to create an app landing page](#).

Change of default theme for Single Integration and capability API

With Qlik Sense June 2019 or later releases, the theme for current selection for Single Integration and capability APIs is set to bright by default. Specifically, this change impacts the 'CurrentSelections' string for `getObject`, and `currsel` for `Single Integration API`.

New product activation method using the License Service component for Qlik Sense February 2019 and later

In Qlik Sense February 2019 or later, a new License Service component is delivered together with Qlik Sense. This service is used when the signed keys are used for product activations. The License Service will connect to a License Backend Service, hosted by Qlik, for product activations and Entitlement Management. This activation process is required for Multi Cloud deployments using Qlik Sense Enterprise on Kubernetes or Qlik Sense Enterprise on Cloud Services as deployment methods. The new activation process is currently optional for Qlik Sense Enterprise on Windows. The use of this activation process is also required if you want to use the new Qlik Sense Analyzer Capacity license introduced with Qlik Sense February 2019.

The Qlik Sense Master node needs access to an internet connection. Port 443 is used for accessing the endpoint at <https://license.qlikcloud.com> and retrieving license information.

You can continue using the standard key with a serial and a control number product activation instead of the signed key method. However, to keep using the standard key activation method you must run Qlik Sense November 2018 in your Multi-Cloud installation.

“idpConfigs” moved to “identity-providers” in the values.yml file

The “idpConfigs” section in the *values.yml* file has been moved from “edge-auth” to “identity-providers”. In this release there is support for having the “idpConfigs” section either in “edge-auth” or “identity-providers”.

Windows PowerShell 4.0 or higher required for installing Qlik Sense September 2018 or later

To install Qlik Sense September 2018 or later, you must upgrade Windows PowerShell to version 4.0 or higher.

New Duplicate action is required to duplicate apps in Qlik Sense June 2018 and later

Duplicate action has been added to the list of actions that can be assigned to users. Until Qlik Sense April 2018, duplication privileges were included in the Create action. When upgrading to Qlik Sense June 2018, duplicate permission is disabled by default. To duplicate apps in Qlik Sense June 2018 and later, Duplicate actions must be assigned to users via the Security rule editor in the QMC.

5 GB total disk space required for installation

To install and run Qlik Sense November 2018, 5 GB of total disk space is required.

Permissions required to call duplicate endpoint have changed

Behavior has changed for customers who upgrade and have previously changed the relevant default rule. The `/qrs/app/{id}/copy?name={name}` endpoint now requires “Read” and “Duplicate” permissions for App instead of “Read” and “Create.” The default rules for Qlik Sense September 2017 and later releases have been modified to ensure that the behavior is the same as in the earlier release as long as the rules have not been previously changed.

Backup recommendations

It is important that you make a backup of the site before upgrading, to be able to recover the site if the upgrade fails.

Upgrade may fail if services are in Disabled state

If a service is in the Disabled state prior to an upgrade, it may lead to the service not being completely uninstalled, and a subsequent failure to install the new version of the service. The rollback of the service upgrade will also fail, which means that the service is not available anymore, and cannot be repaired. The most likely cause of this problem is that other processes are scanning the state of the service during uninstall or upgrade, hence preventing it from becoming completely uninstalled. Examples of such processes are Process Explorer and the built-in Control Panel > Administrative Tools > Services snap-in. This bug in Windows is documented here: <https://support.microsoft.com/en-us/kb/287516>

To minimize the risk of this occurring, do the following in order, before upgrading:

1. Stop all Qlik Sense services manually.
2. Verify that no service is in the Disabled state. This can be done by the **Services** snap-in, or another program that polls service state.
3. Ensure that all service state polling applications are closed, including applications you used in step 2. Setting all Qlik Sense services to Manual start, and then restarting the system is the most reliable way of making sure that all service state polling applications are closed.

Licensing changes to the April 2018 release

Qlik Sense Enterprise now has two new user types: Professional and Analyzer. See:

[Overview of Qlik license usage](#)

If you continue to use Token allocation, there is no change in your licensing requirements in the April 2018 release.

If you adopt user-based licensing, then prior to upgrade, check your current LEF. In the QMC, navigate to the License usage summary, Site license properties, and look for LEF Access.

If your LEF contains one or more of the following lines, you should make sure you record your current user allocation because when you apply the new LEF, the current allocations will be removed.

You have two options for adding users back:

- Manual allocation adding users to the correct user type.
- Change your current rules for auto allocation to allocate to the new user types per your preference.
PROFESSIONAL;NN;;
ANALYSER;NN;;
TOKENS;NN;; (sum of Professional and Analyzer)
IGNORE TOKENS;YES;; (The April 2018 release uses this to determine if it should continue to allocate Tokens to users or allocate the two new user types.)

Applying Analyzer license requires users to log in again

Starting in the April 2018 release, the license check occurs when the user accesses the Hub. If an Analyzer pass is applied after a user has established a QPS session, the user will get the message: "You cannot access Qlik Sense because you have no access pass." User would have to log in again. To avoid this situation, allocate the Analyzer pass before the user accesses the Hub.

Important notice

You cannot upgrade to Qlik Sense June 2017 from a Qlik Sense release earlier than 3.1 SR2. Make sure that you have upgraded to Qlik Sense 3.1 SR2 or later before starting an upgrade to Qlik Sense June 2017.

Upgrading from Qlik Sense 2.x to 3.x will modify the repository database. The upgraded 3.x database is no longer compatible with Qlik Sense 2.x. It is important that you take a backup of the Qlik Sense 2.x site before upgrading to Qlik Sense 3.x so that a rollback can be carried out if required.

Starting with the February 2018 release, the following endpoints changed

/qrs/about/api/default/content	-> /qrs/about/api/default/app/content
/qrs/about/api/default/datasegment	-> /qrs/about/api/default/app/datasegment
/qrs/about/api/default/internal	-> /qrs/about/api/default/app/internal
/qrs/about/api/default/object	-> /qrs/about/api/default/app/object
/qrs/about/api/default/detail	->
/qrs/about/api/default/executionresult/detail	
/qrs/about/api/default/analyzeraccessgroup	->
/qrs/about/api/default/license/analyzeraccessgroup	
/qrs/about/api/default/analyzeraccesstype	->
/qrs/about/api/default/license/analyzeraccesstype	
/qrs/about/api/default/analyzeraccessusage	->
/qrs/about/api/default/license/analyzeraccessusage	
/qrs/about/api/default/loginaccesstype	->
/qrs/about/api/default/license/loginaccesstype	
/qrs/about/api/default/loginaccessusage	->
/qrs/about/api/default/license/loginaccessusage	
/qrs/about/api/default/professionalaccessgroup	->
/qrs/about/api/default/license/professionalaccessgroup	
/qrs/about/api/default/professionalaccesstype	->
/qrs/about/api/default/license/professionalaccesstype	
/qrs/about/api/default/professionalaccessusage	->
/qrs/about/api/default/license/professionalaccessusage	
/qrs/about/api/default/useraccessgroup	->
/qrs/about/api/default/license/useraccessgroup	
/qrs/about/api/default/useraccesstype	->
/qrs/about/api/default/license/useraccesstype	
/qrs/about/api/default/useraccessusage	->
/qrs/about/api/default/license/useraccessusage	

Upgrading from Qlik Sense 3.1 SR2 to Qlik Sense June 2017 or later

Please refer to the online help for instructions: [Qlik Sense upgrades and updates](#)

Change of supported characters for virtual proxy prefix

Starting with the Qlik Sense June 2017 release, a change has been introduced regarding which characters may be used in a virtual proxy prefix. This entails that some users may need to change virtual proxy prefixes in existing Qlik Sense installations

Qlik Sense supports all unreserved characters specified in <https://tools.ietf.org/html/rfc3986> in lower case as proxy prefix. "/" is allowed but not as start or end of the prefix.

This means that the following characters are allowed:

"a-z", "0-9", "-", ".", "_", "~" and "/"

This is enforced by a `_pattern` regex attribute in the object schema which means that both QMC and QRS use the same validation.

Please refer to the online help for instructions: [Editing a virtual proxy](#).

Perform a database cleaning before migrating to 3.x

We recommend that customers with a large number of users or applications perform a database cleanup before migrating from 2.0.x to 3.x.

After performing an upgrade in a multi-node environment, it can take a very long time for newly created database items (such as sheets, applications, bookmarks, or tags) to appear on all nodes. This is caused by long synchronization queues between the nodes, as a result of the upgrade. All new items will be at the end of these queues. From Sense 2.2, the repository database is stored in RAM to improve the performance, for users with very large databases the database can become larger than the available RAM on the server which

results in an error during startup. If you are running a large installation (users or apps) we recommend that you perform the steps described below before performing the upgrade.

Workaround: Synchronization queues will eventually finalize by themselves, but in very large environments this can take several hours. If you import a large Active Directory, it is recommended to do the following before upgrade to reduce upgrade synchronization queues:

- Make sure that you applied best practices for User Directory connectors:
<https://community.qlik.com/docs/DOC-14708>
- If a large Active Directory has been imported without filters, do the following:
 1. Setup LDAP import filters, according to the best practice guide, to reduce size of imported user attributes.
 2. Remove redundant users and perform a new import of the Active Directory.
 3. Run the Database Cleanup Script, provided by Qlik, to clean the repository database before upgrading. To acquire the Database Cleanup Script, log in to the Support Portal and search for article “17620”. The title of the article is “Qlik Sense Database Cleanup Script 2.x and 3.x”.
 4. Restart the system and start the upgrade.

Qlik Sense 3.2 includes jQuery version 3.1.1.

Qlik Sense 3.2 includes jQuery version 3.1.1, which is the latest version. If an extension uses a version of JavaScript that does not support the latest version of jQuery, it will produce an error indicating that a jQuery version lower than version 3 is required. It is recommended that the Bootstrap used with extensions be upgraded to version 3.3.7.

Deprecated functionality

Deprecation notice for Qlik Sense - Synchronized Persistence

The synchronized persistence mechanism to share data in multiple server deployments was officially deprecated by the Qlik Sense June 2017 release.

What does this mean?

Qlik Sense has had a synchronization mechanism for storing and sharing data in a multi-server deployment, which copied data to each machine (“Synchronized Persistence”). In Qlik Sense version 3.1, Qlik introduced a new architecture and additional method for storing and sharing data known as Shared Persistence, which is more scalable than the Synchronized Persistence method. Until now, both Synchronized Persistence and Shared Persistence methods have been available in the product.

What is the impact?

Qlik has now retired the Synchronized Persistence method from Qlik Sense in the next feature release and later versions. Customers who wish to upgrade to Qlik Sense September 2017 from a version of Qlik Sense prior to June 2017 need to plan to reconfigure to use Shared Persistence first. For the majority of customers, the capabilities are the same. However, a small number of customers using geographically dispersed servers will be affected.

What do I need to do?

Customers can move from Synchronized Persistence to Shared Persistence by following some simple steps. The transition to Shared Persistence is not automatically done by upgrading, but the process to transition is not complex. For questions or assistance, please go to <https://help.qlik.com> or contact Qlik Support.

Repository Snapshot Manager tool removed

The automatic backup and restore tool Repository Snapshot Manager has been removed, as it was intended for deployments using synchronized persistence. Please refer to the online help for manual backup and restore procedures.

Installing and removing Qlik Sense Extension bundles from a Qlik Sense installation

In Qlik Sense November 2018 it is not possible to install Qlik Sense Extension bundles through a silent installation. Qlik Sense Extension bundles can only be installed via the regular install procedure, or separately, once Qlik Sense November 2018 is installed. You can install or remove Qlik Sense Extension bundles from your Qlik Sense deployment at any moment. If you have a multi-node installation, Qlik Sense Extension bundles are installed on the central node.

Do the following:

1. In **Control Panel**, open **Programs and Features**.
2. In the list of programs, double-click the extension bundle that you want to install or remove.
3. The Extension Bundle Setup Wizard opens. Click **Next**.
4. Select **Change**.
5. Accept the End-User License Agreement and click **Next**.
6. On the **Custom Setup** screen, click on the bundle icon to select how to modify the bundle installation:
 - If the bundle is installed, select **Entire feature will be unavailable** to uninstall it.
 - If the bundle is not installed, select **Entire feature will be installed on local hard drive** to install it.Then, click **Next**.
7. Click **Change**.
8. When the setup modification is complete, a message invites you to manually restart the Qlik Sense Repository Service.
9. Click **Finish** to close the Extension Bundle Setup Wizard.
10. Manually restart the Qlik Sense Repository Service to make the changes effective.

You can verify that the changes have been correctly applied by checking the Extensions section in the Qlik Management Console (QMC).

You can find the above procedure also on help.qlik.com. See the “Modifying extension bundles installation” section in the following pages:

[Installing Qlik Sense on a single node](#)

[Installing Qlik Sense in a multi-node site](#)

Change in privilege requirements for publishing apps from QMC

Beginning in Qlik Sense September 2018, the privilege requirements for users publishing app objects in the Hub have been modified. Previously publish rights were required for both the app object and stream. With this change only publish rights for the app object are required.

To ensure backwards compatibility, the default security rule OwnerPublishAppObject has been adjusted.

Previously, the Conditions for the security rule were:

```
resource.IsOwned()=user  
resource.owner=user  
resource.approved="false"
```

An addition has been made to the Conditions so that they now are:

```
resource.IsOwned()=user  
resource.owner=user  
resource.approved="false"  
resource.app.stream.HasPrivilege("publish")
```

The effect of the rule is that publish rights to the stream and app object are required. For customers who wish to segment the ability to publish an app object from publishing to a stream, it is recommended that the default rule be disabled and the needed adjustments to a new rule be made.

BNF script reload mode

A new script reload mode, BNF, has been introduced. In some unusual cases, users may need to disable the BNF reload mode using one of these methods:

- **Disabling BNF reload mode for the entire server:** Update the Settings.ini by adding the line EnableBnfReload=0 under the [Settings 7] tag for the default reload setting "EnableBnfReload". Restart the engine.
- **Disabling BNF reload mode for individual apps:** Add the ///\$bnf off tag at the top of the script (it must be within the first 50 characters of the script). Reload the script.

Search history in smart search

Search history when using smart search is now implemented. Smart search history is not available for anonymous users. Smart search history is only visible for the user profile that performed the search.

New security properties for the Qlik REST Connector

The Qlik REST Connector has new security properties in the connection dialog. Existing connections must be modified to conform to the requirements of the new properties.

The Qlik REST Connector supports the ability to include HTTP headers in the response object. Starting with the November 2017 release (version 1.2 of the REST Connector), loading of the headers does not happen by default. It must be explicitly allowed. Existing connections that load the response headers must be reconfigured with the **Allow response headers** parameter.

Translation of Bar Chart changed for French and Traditional Chinese

The translation of Bar Chart has been altered for two languages. The new translations are for French: Graphique en barres, and for Traditional Chinese: 橫條圖.

System requirements notes

Please refer to the online help for information about the requirements for Qlik Sense:

[System requirements for Qlik Sense](#)

Additional notes:

- On a machine with a server operating system, it is only possible to install Qlik Sense (server), not Qlik Sense Desktop.
- From Qlik Sense 3.1 SR2 and forward, you need to start the Qlik Sense Service Dispatcher (QSD) service before starting the Qlik Sense Repository Service (QRS).

IdevioMaps

IdevioMaps of version 5.7.5 is supported by Qlik Sense 3.2.



About Qlik

Qlik is on a mission to create a data-literate world, where everyone can use data to solve their most challenging problems. Only Qlik's end-to-end data management and analytics platform brings together all of an organization's data from any source, enabling people at any skill level to use their curiosity to uncover new insights. Companies use Qlik to see more deeply into customer behavior, reinvent business processes, discover new revenue streams, and balance risk and reward. Qlik does business in more than 100 countries and serves over 48,000 customers around the world.

qlik.com

© 2019 QlikTech International AB. All rights reserved. Qlik®, Qlik Sense®, QlikView®, QlikTech®, Qlik Cloud®, Qlik DataMarket®, Qlik Analytics Platform®, Qlik NPrinting®, Qlik Connectors®, Qlik GeoAnalytics®, Qlik Core®, Associative Difference®, Lead with Data™, Qlik Data Catalyst™, Qlik Associative Big Data Index™ and the QlikTech logos are trademarks of QlikTech International AB that have been registered in one or more countries. Other marks and logos mentioned herein are trademarks or registered trademarks of their respective owners. BIGDATAWP092618_MD