QLIK EVALUATION GUIDES

Qlik Cloud® Analytics

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1 Qlik Cloud® overview

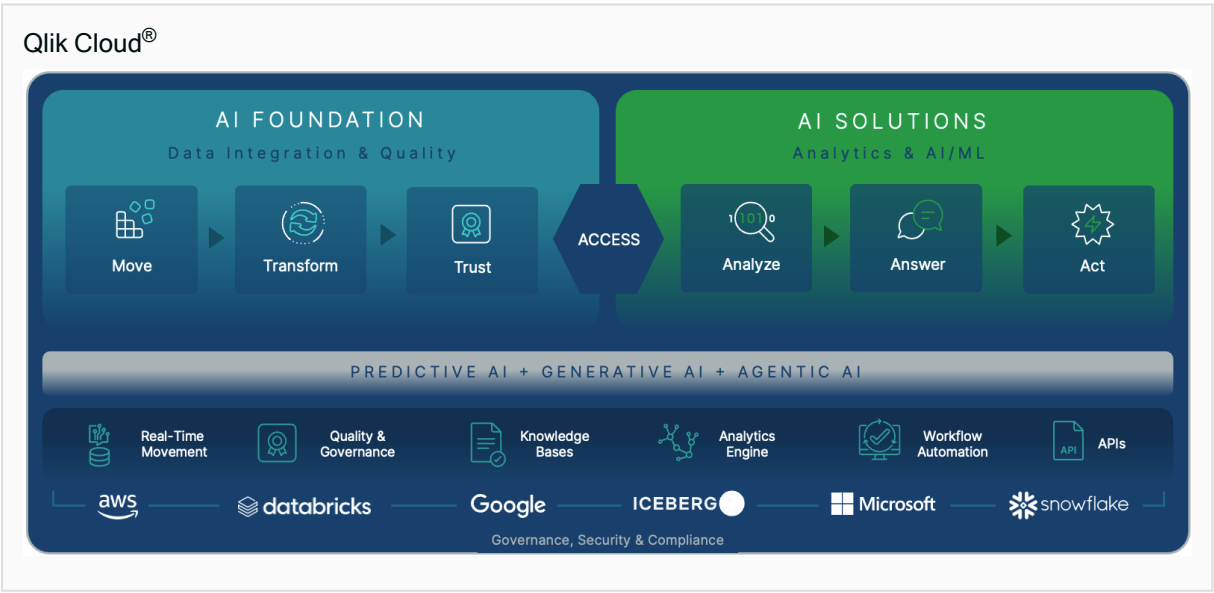
Qlik is a leader in data and analytics with a core mission to provide solutions that ensure organizations can work smarter and use data as a competitive edge. Qlik Cloud is a powerful end-to-end solution for data and analytics services. Our platform empowers curiosity-driven exploration offering everyone – at any skill level – the ability to use data to make transformative change for their organization.

Through several data-focused services, the Qlik Cloud platform supports a full range of users and use-cases across the lifecycle from data integration to insight generation. These services include change data capture, transformation, data cataloging, application automation, self-service analytics and dashboards, conversational analytics, custom and embedded analytics, and alerting.

This document highlights key aspects of the Qlik Cloud platform, including architecture, security, governance, and reliability. It is designed to complement the technical documents for the Qlik solutions that run on the Qlik Cloud platform.

1.1 Architecture overview

All of Qlik's SaaS offerings and services, known collectively as Qlik Cloud®, run on the Qlik Cloud platform. The platform delivers the underlying compute, storage security, and governance features to provide services to our customers. The Qlik Cloud® Platform enables the creation of the analytics data pipeline. Powered by Qlik Cloud and a rich set of foundational services, it provides all the data integration and analytics services you need to transform raw data into informed action.



A customer's instance of the Qlik Cloud platform is called a tenant. It is logically separated from other tenants by using unique encryption keys. Access to the platform is controlled by the customer's configured identity provider and any access to functions within the platform is based on the entitlements the customer has assigned across roles and users. A number of services are available on the Qlik Cloud platform:

- Analytics – provides a complete third-generation analytics solution - Qlik Cloud Analytics
- Data Integration – provides the ability to manage your data assets and utilize change data capture to provide real-time access to your data, as well as application automation to automate integrations between cloud applications.

Qlik Cloud Analytics®

Incorporating our premier offering Qlik Sense, Qlik Cloud Analytics sets the benchmark for third-generation analytics platforms, empowering everyone in your organization to make data-driven decisions. Built on our unique Associative Engine, it supports a full range of users and use-cases across the lifecycle from data to insight: self-service analytics, interactive dashboards, conversational analytics, custom and embedded analytics, mobile analytics, reporting, and alerting. It augments and enhances human intuition with AI-powered insight suggestions, automation, and natural language interaction.

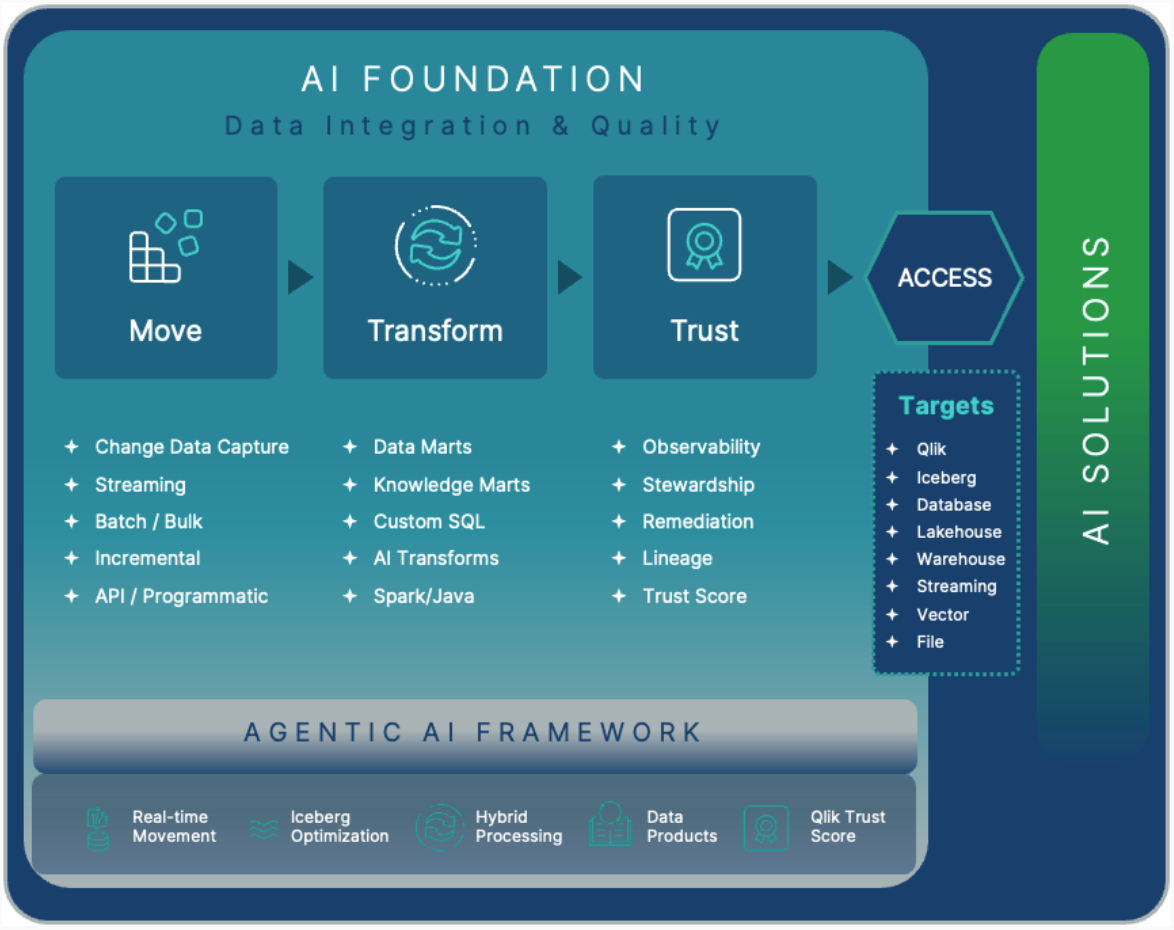
Qlik Analytics

Qlik Talend Cloud®

Qlik Talend Cloud is Qlik's hosted and managed data integration platform as a service (iPaaS). Our vision is to provide a broad variety of data integration services aimed at helping you move from passive to active BI. Qlik Talend Cloud is architected for real-time data capture, transformation, and analytics-ready data

delivery leveraging a variety of methods in our unique change data capture approach.

Qlik Talend Cloud



Real-time data movement

Replicate data from on-premises or cloud sources into Qlik Cloud and other leading cloud data platforms. Automatically and continuously ingest data without the need for job scheduling or scripting. Your data is updated without manual intervention to drive insights and actions of important business moments.

Data transformation

Quickly turn raw transaction records into consumption-ready data via auto-generated, push-down SQL. Our no-code interface helps you create reusable transformation pipelines that intelligently conform data to dimensional models or custom formats.

Qlik Automate™

Qlik Automate is an integration platform to build integrations and automation flows between cloud applications. Closely integrated with the other Qlik Cloud services, Qlik Automate is able to build workflows

between your cloud applications using a no-code approach by connecting data sources, applying conditions, calling webhooks, adding loops, scheduling runs, and setting up triggers. For example, a webhook in your CRM system could initialize a reload of your sales performance Qlik Sense application.

1.2 Qlik Cloud® Editions

There are several Editions of Qlik Cloud to meet the varied needs of our customers. The Evaluation Guides are designed to cover all the functionality of Qlik Cloud Analytics, Qlik Talend Data Integration and the Qlik Cloud Platform. There is also a special version of Qlik Cloud for Government organizations in the US, known as Qlik Cloud Government. Information provided in the Evaluation Guides does not imply that those features are available in all Editions.

For information on your edition, see the relevant link below:

- Qlik Cloud Analytics user-based subscriptions
- Qlik Cloud Analytics capacity-based subscriptions
- Qlik Talend Cloud capacity-based subscriptions
- Qlik Cloud Government

2 Qlik Cloud Analytics

Qlik Cloud Analytics is designed to provide our customers with a service to securely run their analytic workloads to the cloud. Built on the Qlik Cloud platform, Qlik Cloud Analytics has been designed to automatically scale to meet the workloads of the modern enterprise, and provides Qlik customers a platform that can consolidate generative & predictive artificial intelligence, Qlik Sense, QlikView and other business intelligence assets in a single environment.

With a global presence and a strong focus on security and availability, Qlik Cloud Analytics provides a safe and secure platform for our global customers. With the ability to choose where the tenant is hosted, customers can ensure their data is close to their location and in a geography that meets their business requirements.

For existing Qlik Sense Enterprise Client-Managed customers, Qlik Cloud Analytics has the capability to facilitate the transition to SaaS. Customers can choose to continue reloading apps on-premise, move some apps to Qlik Cloud, or use a data gateway to access their data sources on-premises while moving consumption to the cloud. Integrated identity providers and flexible deployment and subscription options make this easy to manage and minimize costs during the transition.

Qlik understands that our customers often want to integrate and embed their analytics and visualizations into their own portals and systems. Therefore, Qlik continues to invest in providing integration approaches and supported open-source libraries and tools to make this easier for our customers. With comprehensive APIs and Qlik's developer portal providing resources and examples, Qlik is committed to helping our customers make Qlik Cloud Analytics a part of their own solutions.

2.1 Qlik Sense overview

Qlik Sense sets the benchmark for third-generation analytics platforms, empowering everyone in your organization to make data-driven decisions. Built on our unique Associative Engine, it supports a full range of users and use-cases across the lifecycle from data to insight: self-service analytics, interactive dashboards, conversational analytics, custom and embedded analytics, mobile analytics, reporting and alerting. It augments and enhances human intuition with AI-powered insight suggestions, automation, and natural language interaction. And Qlik Sense offers unmatched performance and governance, with the convenience of SaaS or on-premises deployment.

Qlik Sense applications can be deployed to Qlik-managed and cloud-based solutions *Qlik Cloud analytics* & and *Qlik Sense Enterprise Client-Managed*. The focus of this document is Qlik Cloud Analytics.

2.2 Qlik Cloud Analytics overview

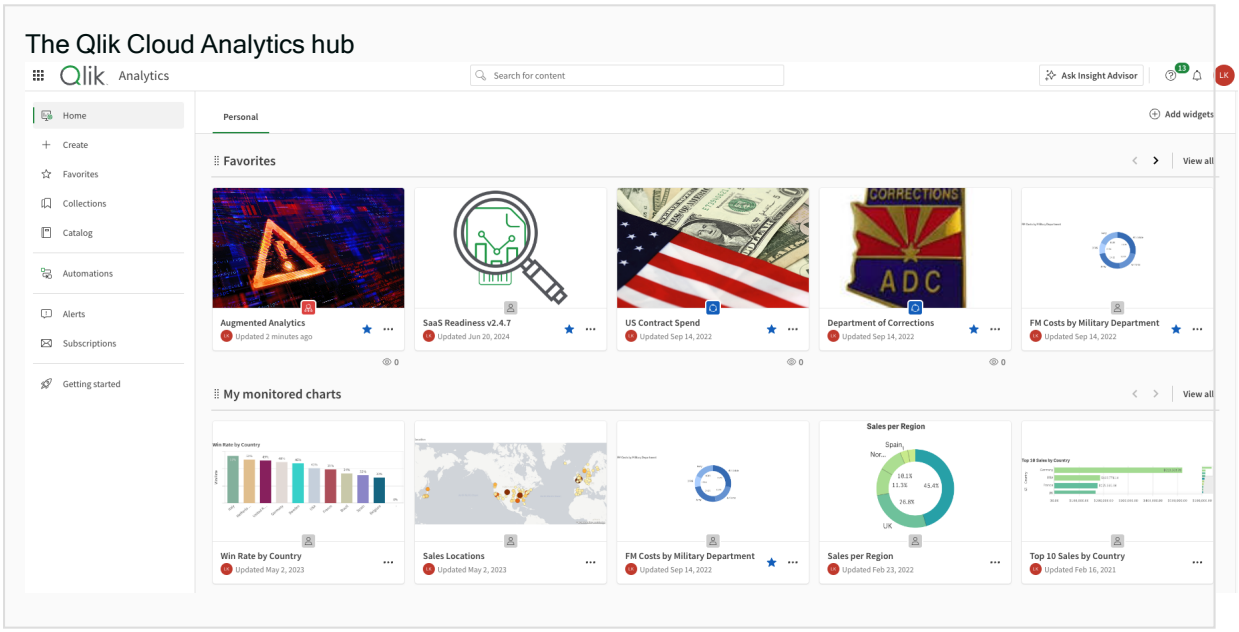
As part of Qlik's cloud-first strategy, we have developed our own cloud platform, Qlik Cloud, on which we manage cloud editions of our product portfolio to deliver them to customers and partners as software-as-a-service (SaaS) offerings. Qlik Cloud Analytics is designed to promote human intuition and data literacy for users of all skill levels, allowing people to easily explore information and quickly gain trusted insights to solve problems. Qlik Cloud Analytics provides businesses with world-class analytics without the

complexities of installing and managing their own deployment. Rather than require customers to learn and manage multiple software products, Qlik Cloud Analytics incorporates functionality such as reporting, Artificial Intelligence and Automation as features into a single platform to enhance ease of use and support a gradual evolution of a customers analytics landscape.

2.3 A single platform for analytics

The micro-service based architecture behind Qlik Cloud Analytics allows us to host both Qlik Sense and QlikView applications (apps) in a customer's Qlik Cloud tenant. This means that users have a single location to open and consume their Qlik apps.

In addition to hosting Qlik apps, Qlik Cloud Analytics provides the ability to add links to other types of reports and assets such as documentation, providing a single portal for your users to consume all your analytics and reporting assets.



Associative, in-memory apps

Qlik couples in-memory data storage technology with an associative engine that lets you analyze and freely navigate data intuitively. In its second generation, the proven Qlik Associative Engine allows you to easily explore data and create visualizations based on data from multiple data sources simultaneously. These sources range from Excel® and Access® to databases such as Oracle® and SQL Server to big data sources such as Cloudera® and Redshift®.

Qlik Sense uses columnar, in-memory storage. Unique entries are only stored once in memory, and relationships among data elements are represented as pointers. This allows for significant data compression, more data in RAM, and faster response times for your users.

What is an App?

When Qlik talks about applications or apps, we are not meaning executable programs like an app on your phone or PC; we are referring to a grouping of the components that make up your analytics solution. Your associative model, data load scripts, data, dashboards, and other visualizations are all packaged together as a Qlik Analytics application, or App. QlikView, while also based on our associative engine, sometimes refers to apps as Documents for historical reasons, however in the Qlik Cloud Analytics Platform we generally use the term Application to refer to both.

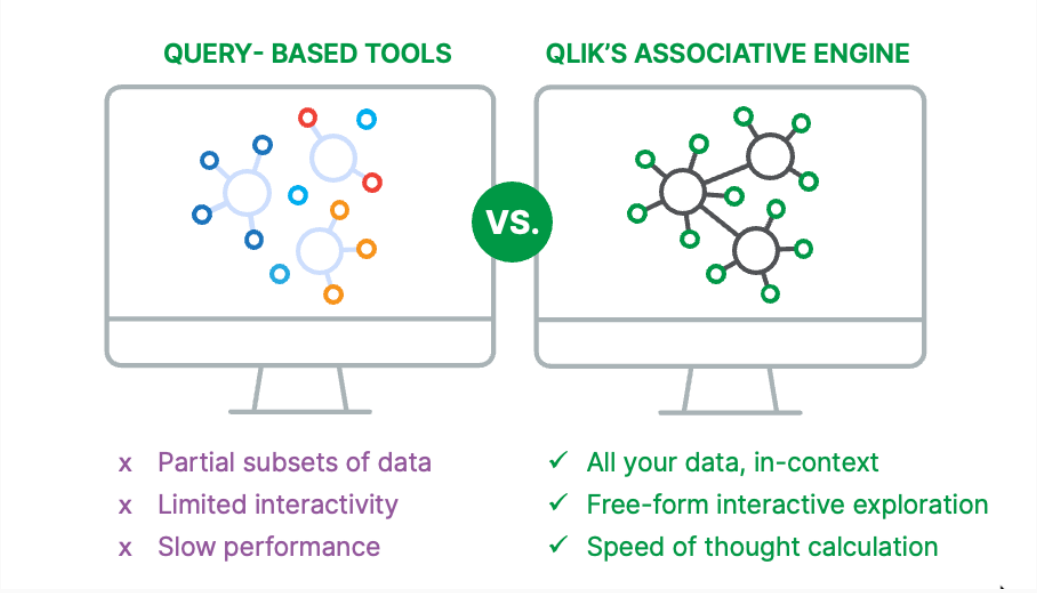
The Associative Difference

Relational databases and queries were designed in the 1980s for transactional systems, not modern analytics. Query-based tools leave data behind and limit your users to restricted linear exploration, resulting in blind spots and lost opportunities. Qlik Analytics apps run on our unique Associative Engine - known as the Qlik Analytics Engine, enabling users of all skill levels to explore their data freely without limitations.

The Qlik Analytics Engine brings together unlimited combinations of data – both big and small – without leaving any data behind. It offers unprecedented freedom of exploration through interactive selection and search, instantly recalculating all analytics and revealing associations to your user in green (selected), white (associated), and gray (unrelated).

By keeping all visualizations in context together and retaining both associated and unrelated values in the analysis, the Qlik Associative Engine helps your users discover hidden insights that query-based tools would miss.

Associative vs Legacy BI



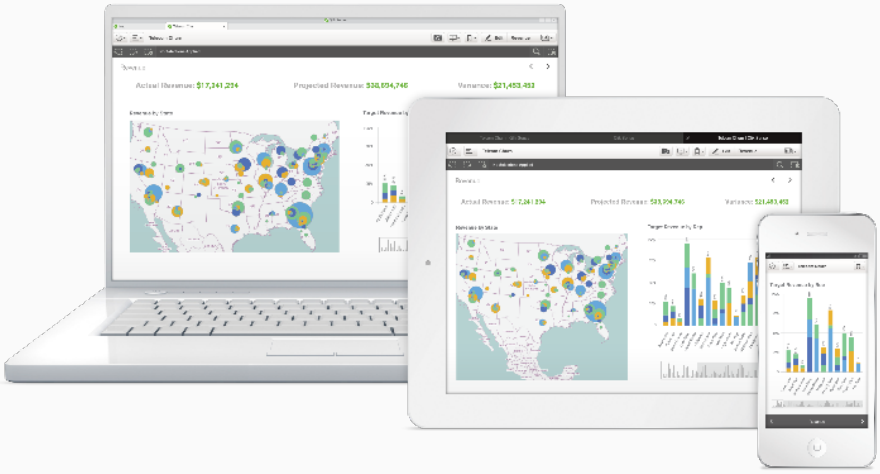
The Qlik Analytics Engine is purpose-built for highly scalable, dynamic calculation and association on massive data volumes for large numbers of users. This unique technology is our primary advantage, with more than 30 years of innovation and investment.

In some big data scenarios, data should remain at the source, which is why Qlik uses a built-in technique called On-demand Application Generation. Data sources can be queried based on your users' selections, yet still provide an associative experience to your user. Qlik's Dynamic Views feature expands this capability further for the biggest data sources available.

User interfaces

Access to the Qlik Cloud Analytics environment is through a zero-footprint web browser interface, known as the Qlik Sense Analytics Hub. The Qlik Sense web browser interface makes all aspects of development, drag-and-drop content creation, and consumption possible. Qlik Sense features a responsive design methodology to automatically display and resize visualizations with the appropriate layout and information to fit the device – whether it is a browser on a laptop or desktop, tablet, or smartphone. Built with current standards of HTML5, CSS3, JavaScript, and web sockets, Qlik Sense enables you to build and consume apps on any device.

Qlik Cloud Analytics uses responsive design to provide the best experience for each type of device



In addition to the web-based interface, Qlik Sense supports conversational analytics which integrates with major chat platforms such as Slack ® and Microsoft Teams ®, and data alerting capabilities to allow users to subscribe to and be notified of key changes to their data.

Focus on visualizations

Qlik continues to invest heavily in the visualizations available for Qlik Analytics applications. Qlik delivers on average 18 new visualization features per release. This includes new chart types and advance formatting options for existing charts. Qlik supports our customers further though our Qlik design blog, where we provide expert advice and best practice recommendations to build powerful and effective visualizations.

Direct Query applications

A data model for a Direct Query app

While most use-cases benefit from the power of Qlik's Associative and Cognitive engines, there are times when accessing the data in real time is worth forgoing these benefits. There are also cases where big data scenarios necessitate push-down aggregation against massive data sets. For these use-cases Qlik has developed Direct Query.

Direct Query complements Qlik's already best-in-class analytics engine and strengthens the overall range of consumption techniques customers can leverage when analyzing data.

Direct Query provides the ability for a Qlik Analytics application to directly connect to a cloud database and autogenerate SQL queries as the user interacts with visualizations and easy user filtering. This is commonly called "SQL Pushdown", where users "push down" queries onto the database, which is different from what our analytics engine does in-memory. Direct Query uses a logical data model to understand the source data and generate SQL.

Direct Query allows real-time access to your data and offers a subset of functions available in a traditional in-memory app. Direct Query is not designed to be a solution for all data access requirements. It is best suited to the following use-cases:

- Data Analyst exploring new database and tables
- Simple dashboard for live KPIs, small number of users

- Prototyping dashboard in initial phases before production
- Direct Query as springboard for extracting slices of data into Qlik Analytic Engine using on-demand apps.

Direct Query supports major cloud databases (Snowflake, DataBricks, Google BigQuery and Redshift) and will be expanded to other cloud data sources in the future.

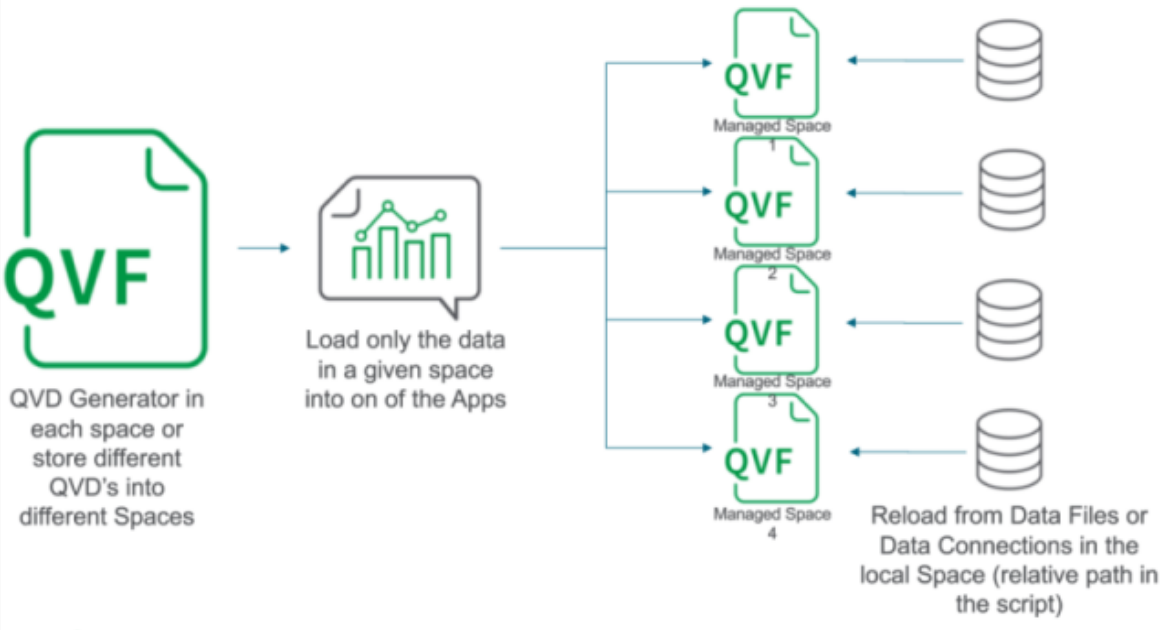
Focused apps for your organization

There are often occasions where you need to provide a focused app for a subsection of your organization. For example, a bank may wish to provide each branch with an app containing only data relating to that branch.

In QlikView, a solution for this problem is called *loop and reduce*, where a huge application is created containing data for every segment required, which is then broken up into the required segment apps. The challenge with this approach is loading the single huge app requires massive resources, is a very slow process as it runs sequentially and places all resulting apps in the same space. A way to do this using Qlik Automate was introduced in 2022, however the same challenges present in QlikView are also present here.

An alternative approach to this is to create focused apps based on segmented QVDs that are published to dedicated spaces for each segment. A central QVD generating Qlik Script (or a set if preferred) loads the data and creates QVDs in the relevant spaces. An identical copy of the focused app is placed in each space and uses relative paths to load the QVDs present in the space. These can load in parallel if required.

Focused Apps



An alternative way of doing this forgoes the QVD generator and instead uses relative connections to the data source to achieve the same objective; this requires a way to generate the appropriate where clause, either from the space name, a mapping table or equivalent method.

Any user can develop apps

When building a new app, Qlik Cloud Analytics supports two authoring experiences depending on the user type, a simplified interface for new users and an advanced interface for experienced users.

Powerful, yet easy to use authoring

The sophisticated authoring capabilities of Qlik Sense give you greater control over your visualizations and make it easier to build guided analytics applications for faster data-driven insights. Recent authoring innovations enable you to deliver a richer analytics experience, clarify insights, and give users a deeper understanding of their data to expedite data-driven decision-making. Over the past few years, Qlik has added more than 100 advanced authoring capabilities for Qlik Sense that make it easy to create and consume guided applications. These Advanced Authoring capabilities are designed to balance:

• The ease of use of self-service analytics with Qlik Sense

• The flexibility to address all the complex use cases your business requires

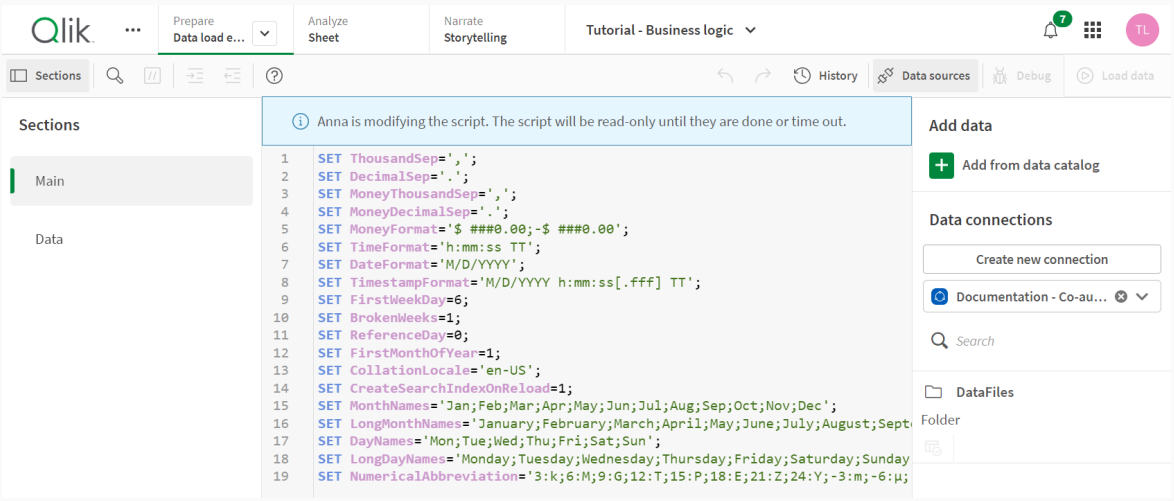
• The advanced functionality, settings, and options within charts and visualizations that power users require

Our goal has been to give both developers and self-service business users the ability to do more, ensuring you have both the capability and scalability to author the apps you need.

Co-development of analytics models

In the Qlik Cloud Analytics platform, it is possible for a team of developers to work on an application's data model. By default only the app's owner can access the data load editor. If we want other developers to be able to edit the data model, we provide them with the Can edit data in apps role. When one user is editing the load script in Data load editor, the script is locked for other users.

An application being accessed where another user is making changes

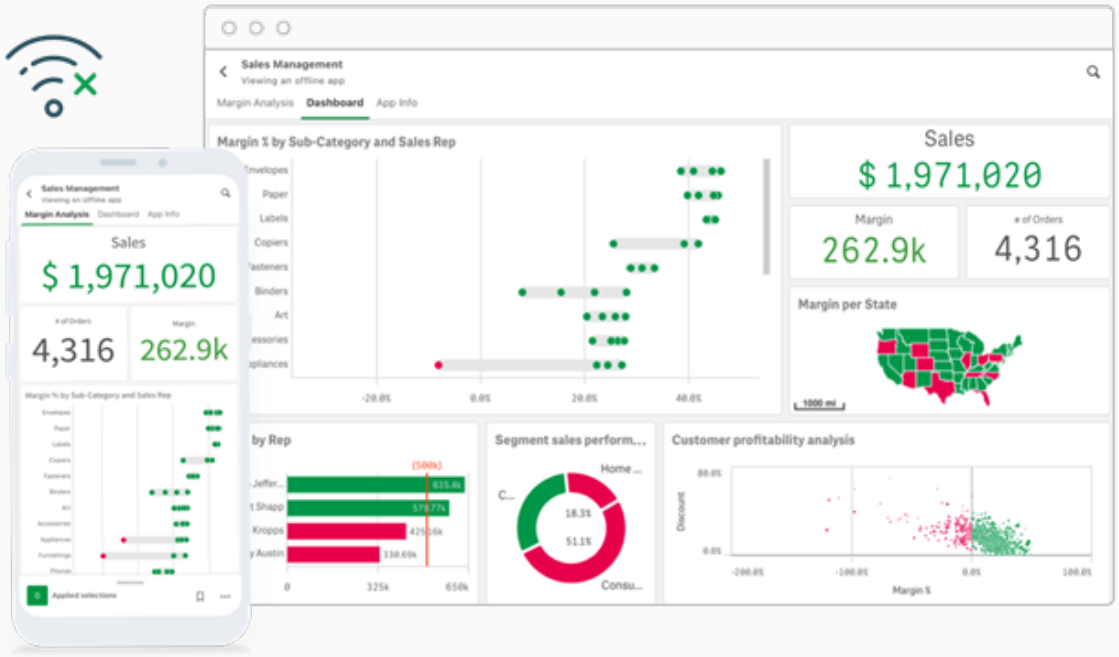


Access SaaS applications where you want, how you want

Qlik Analytics on Mobile delivers all the power of the Qlik analytics platform on your device, whether phone or tablet. Users get an enhanced mobile user experience, offline analysis, and integrated alerting for real-time action at the point of decision.

With a key technology breakthrough - our associative engine running locally on-device - Qlik Analytics on Mobile provides fully interactive exploration and analysis even when reliable connectivity is not guaranteed.

Offline Qlik Applications



Collaborative notes

Notes are a feature of Qlik Cloud Analytics that allow you to add commentary on an application and share with colleagues. Notes can be either personal or shared as desired. Notes can be textual, or can include a snapshot from a chart that you want to discuss. Notes can tag other users, so they will know that you want to make them aware of your note. You can also search for notes that relate to a certain chart to see what notes others have made about it. Notes can have a restricted audience, can be made read-only for certain users, or can be made public so that all users can contribute.

A note showing a snapshot and tagging another user

Advanced analytics and machine learning

Most organizations today have either implemented or are planning to implement some form of advanced analytics functionality as part of their analytics lifecycle. The challenge for many is that they lack sufficient (or any) data scientists; a highly specialized and in-demand skillset.

Qlik's approach to advanced analytics therefore provides several solutions for different skill levels and needs:

- **Insight Advisor** to auto-generate advanced analyses and insights and support natural language interaction including search and conversational analytics.
- **Qlik Predict** to provide an automated solution that makes machine learning available to regular developers.
- **Analytics Connectors** to support integration with more advanced and specialized solutions for Data Scientists.
- **Qlik OpenAI Connector** to request and embed generative AI content, such as those that power ChatGPT, directly in their analytics experience.

AI takes the Staige at Qlik

For over 5 years Qlik has been integrating Artificial intelligence and machine learning into our Analytics platform. Qlik Staige expands on these initiatives to allow our customers confidently and securely deliver AI solutions on their own data. Qlik wants to provide a solution to our customers which provides:

- a trusted data foundation for AI
- AI-enhanced analytics
- Self-service AI Solutions

While many AI initiatives require the use of experimental technologies that lack the security or audibility needed for Enterprise solutions, Qlik is focused on delivering governed AI. This spans experimenting with and implementing generative AI models, running robust data analysis, efficient problem-solving and developing AI-powered predictions – all within a trusted and controlled environment. The effectiveness of any AI initiative is going to be limited by the availability of reliable data to train the AI models with. This is why Qlik Staige is not limited to data analytics, Qlik is integrating AI into the end-to-end data lifecycle for our customers. We believe there are four fundamental areas needed for your data, to ensure a successful approach with generative AI:

- **Data Variety**: The many sources of structured, semi-structured and unstructured data used by your organization, whether sourced from your own systems or third parties. The ability to bring together data from multiple sources fuels the effectiveness and efficiency of AI applications.
- **Data Governance**: The set of roles, processes, policies and tools which ensure proper data quality, compliance, privacy and security throughout the data lifecycle across an organization.
- **Consumable Insights**: Presenting your data in an easily consumable, annotated and often visual format.
- **Connected Systems** - It is not enough to gain insights from your data, these insights need to in turn feed action in your organization. AI-powered analytics should be able to proactively notify and/or recommend actions to be taken. These actions should in turn be able to drive change in your business though automation and reverse-etl solutions.

At Qlik we believe that just as other forms of AI have augmented rather than replaced traditional analytics, generative AI will positively impact the analytics experience, but not replace it. Qlik first introduced AI into its analytics platform five years ago, and will continue to adapt our offerings to enable users to take full advantage of the power of AI.

We believe that, with generative AI technology being very new, it presents many challenges in its current form. Thus human knowledge on how to best use these new capabilities and their limitations will remain critical to the process for the near future.

Conversational analytics

Insight Advisor Chat is a chat-based interface for conversational analytics that lets users search for insights across any apps assigned within their hub. Insight Advisor Chat can recognize and be programmed to return insights from the most appropriate apps that contain relevant results based on the queries or metrics identified.

When users select a specific app, Insight Advisor Chat provides a text response or visualization. Insight Advisor Chat may suggest further analyses for a query that creates different visualizations. Users can also ask follow-up queries, such as in a 'sales for a particular country' or for a particular year, and Insight Advisor Chat will provide new results.

Users can phrase search queries for facts, comparisons, and rankings. Facts are statements such as "What are my sales?" or "Show expenses over time for 2019". Users can ask for a comparison by adding "vs" or compare to a query. For example, "Compare sales to expenses over time". Users can ask for rankings by adding 'top' to a query.

For example, *"Show me top 10 product by sales for 2020"*.

Insight Advisor Chat can analyze an app to see how fields are used to create charts. The Qlik Precedents Service examines the use of data fields and master items in charts. This teaches precedents for making aggregations, dimensions, and measures for the data model of the app. In unpublished apps, Insights can use precedents learned from published apps and from user feedback in the app.

conversational analytics in Microsoft Teams & other solutions

The Qlik Sense Natural Language (NL) Query API lets users embed Augmented Analytics capabilities into their products such as integration into an existing chatbot platform. Users can use the NL Query API to query a selected app or multiple apps. The API responds with text or a visualization.

With MS Teams, Qlik has built this capability as the Qlik chatbot app. The app allows users to interact with your analytics directly in an MS Teams channel, collaborating with your collegues around your data. Qlik supports the chatbot in the following conversation settings:

- Personal chat between you and the Qlik app
- Group chats between you and one or more other users
- In a team channel

For more information about Insight Advisor, see: AI & Machine Learning

Qlik Predict

Qlik Predict is an advanced analytics service in Qlik Cloud Data Services. Previously available as a separate cloud platform, Qlik Predict has now been fully integrated into Qlik Cloud and is available to all enterprise customers.

Qlik Predict can build and deploy machine learning (ML) models without writing code. It automates the process of applying machine learning to real world problems, including data preparation, feature

extraction, and algorithm selection and optimization; tasks that traditionally require a data scientist. Enabling analytics teams to embrace machine learning without specialized skills will enable them to close the key gaps between data and insight, and between insight and action.

Qlik Predict provides the ability to train models to a particular dataset across a range of structured supervised machine learning problems. Predictions are generated and include prediction explanation scores to help understand the outcome. Qlik Predict seamlessly connects to data in the Qlik Cloud Catalog, which provides connectivity to a wide range of data sources. What if scenario modeling through Qlik Sense enables customers to understand how changes in input data are impacted by the model. Qlik Predict exposes API endpoints that can be called to make predictions for real-time use cases.

What algorithms does Qlik Predict use to train models?

By default, Qlik Predict runs several different algorithms based on the metric selected for predictions. We use algorithms contained in open source libraries such as scikit-learn.

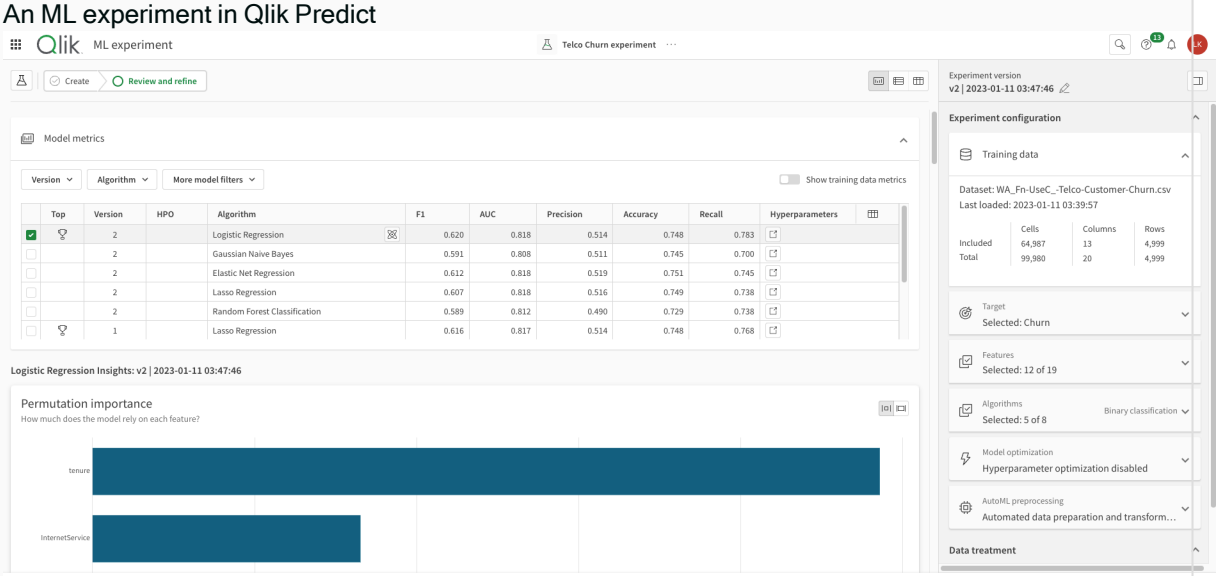
The algorithm types we support include:

- **Binary Classification Models**
- **Multi-Class Classification Models**
- **Regression Models**

Working with Qlik Predict is a two-phase process:

- ML Experiment: This is where we train the model against a set of historical data (for example closed sales opportunities) and evaluate the best algorithms for predicting future state. We can see which factors most heavily influence historical results and exclude attributes we feel should be excluded.

An ML experiment in Qlik Predict

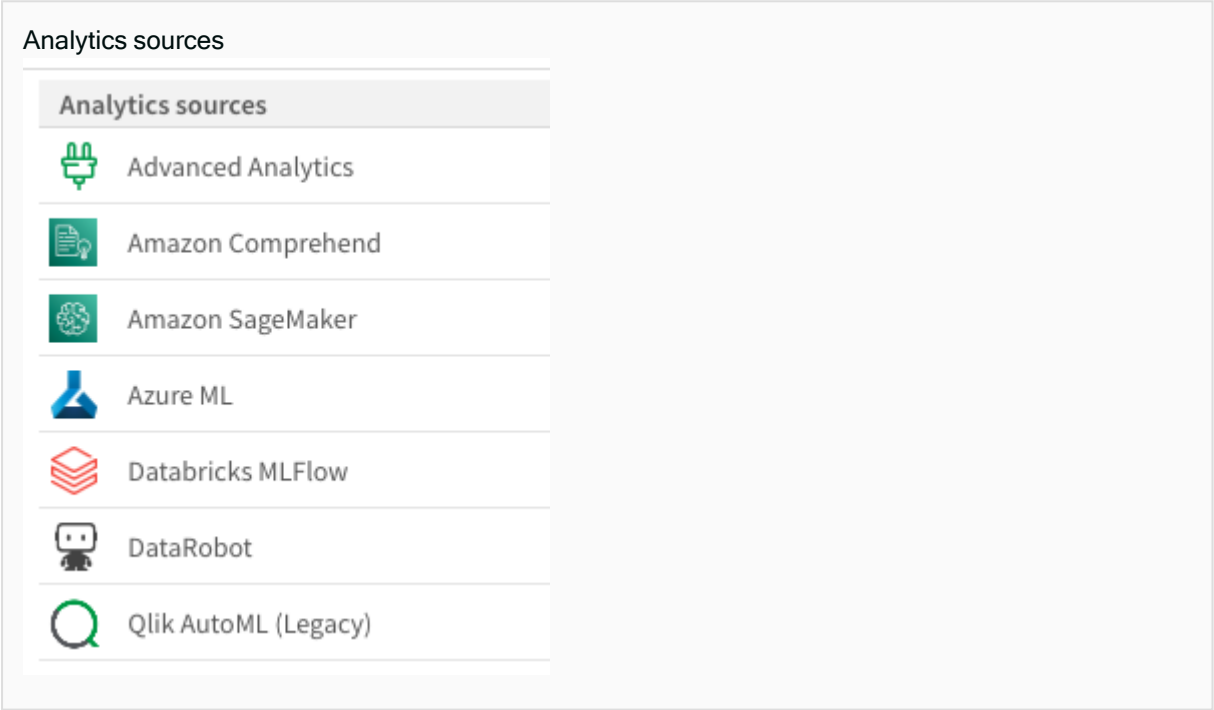


When we are confident in our experiment we deploy this model.

- ML Deployment: Here we take the model we created in the experiment and use this to process the dataset we wish to make predictions on. Predictions can be made against datasets in the form of files, or in real-time by providing the data through our REST APIs. This data can in turn be used in your analytics applications.

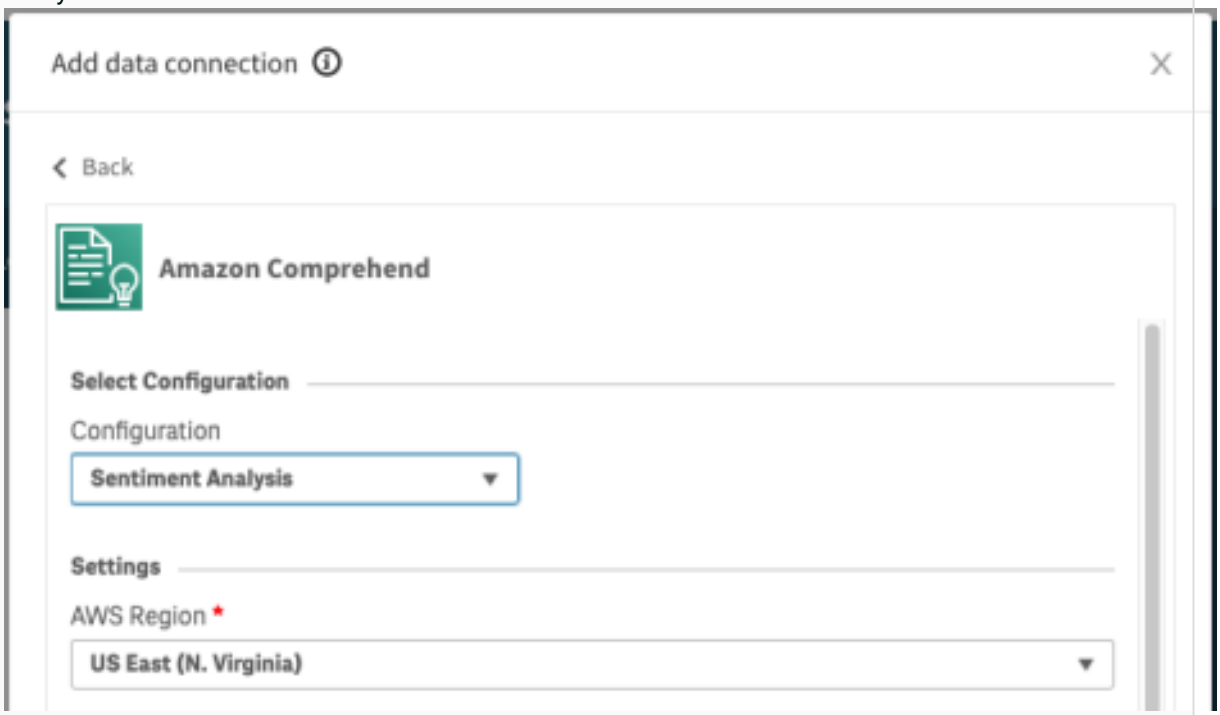
Analytics connectors

Customers have been able to create innovative integrations with Qlik Analytics using our Advanced Analytics Integration technology for several years. Additionally, to meet customers' needs aligning with strategic platforms, Qlik offers integration to native tools kits and open-source technology such as R and Python. Most customers are aligning with a strategic platform of choice and any integration needs to be simple and supported rather than an API that allows for them to build their own.



With Advanced Analytics Integration on Qlik Cloud, Qlik has taken the best of AAI technology and made it available on Qlik Cloud with direct connectivity to a range of third-party Machine Learning platforms such as Amazon Comprehend and SageMaker®, Azure ML®, and DataRobot®. These capabilities are paired with a new generic interface that will allow customers to connect to a wide range of third party or custom-built REST interfaces, allowing for a more flexible integration without the need to build a complete connector for other services.

Analytics connection



Analytic Connectors are as simple to setup as any current database connector and allow for Qlik to be paired with a customer's Machine learning platforms of choice for a wide range of innovative use cases which allow the transformational value of the data science to extend into the analytics and enable decision makers across the organization.

2.4 Working with Qlik Cloud Analytics

Qlik Cloud Analytics is far more than just an analytics tool, it's an end-to-end environment for your analytics. By familiarizing yourself with the Qlik Cloud Analytics environment, you will be able to structure your analytics workflow to meet your data, governance and manageability needs.

Tenants, user roles and entitlements

Tenants

Each customer creates an instance of the Qlik Cloud environment, which is called a tenant. Qlik Cloud Analytics is a service of Qlik Cloud and therefore each Qlik Cloud Analytics customer has their own tenant. Tenant names are automatically generated for the region that you choose on creation, for example abcdefgh.eu.qlikcloud.com. Customers can optionally set their own alias, such as mycompany.eu.qlikcloud.com.

Roles

There are several roles available in Qlik Cloud Analytics, which determine the functions that a user can perform. These compliment the platform roles such as Tenant Admin. The roles available in Qlik Cloud Analytics are:

- **Analytics Admin** – A user with this role is a partial administrator. They have access to the the Management Console, but only to the areas of governance and content.
- **Shared Space Creator** – A user with this role can create shared spaces.
- **Managed Space Creator** – A user with this role can create managed spaces.
- **Private Analytics Content Creator** – A user with this role can create analytics content in their personal space, and create alerts and subscription reports.
- **Steward** – A user with this role can create and maintain business glossaries.

These Qlik Cloud Analytics roles work with the platform roles such as Tenant Admin and the users' entitlements, such as professional and analyzer access. Roles can be assigned to groups or to individual users.

Spaces

Spaces are areas of the Qlik Cloud Analytics hub used to develop and control access to apps, data files and data connections. The types of spaces in Qlik Cloud Analytics are:

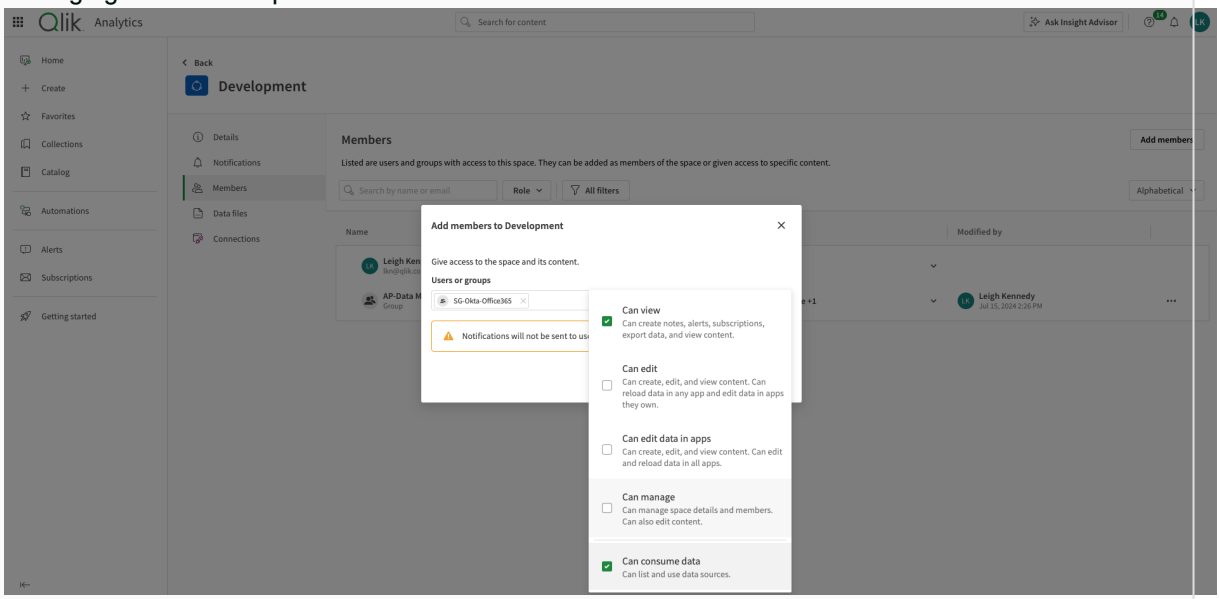
- **Personal spaces** – Private work areas for each user in the Qlik Cloud Analytics hub.
- **Shared spaces** – Areas used to develop apps collaboratively and share them with other users in the space. A group of users may use a shared space for the private development and consumption of their own apps.
- **Managed spaces** – Governed sections of the Qlik Cloud Analytics Hub that are used for providing access to apps with strict access control both for the app and the app data.

In addition to the analytics spaces, Qlik Talend Data Integration provides:

- **Data spaces** - Used to manage access in Qlik Talend Data Integration. Files loaded into a data space by Qlik Talend Data Integration can be consumed by Analytics apps.

Data files and data connections, just like apps, can also be stored and reused across the different space types. These assets can be accessed from other spaces if the appropriate permissions have been granted. For example, an application in the Sales managed space may use a data connection defined in the Sales shared space if desired.

Managing access to a space

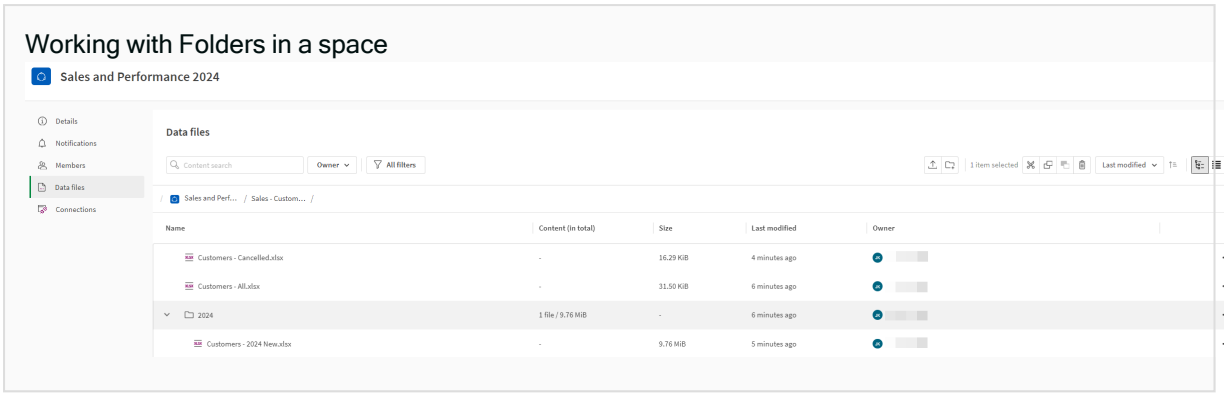


Access to shared and managed spaces can be assigned directly to either users or to groups. It is considered best practice to use groups and manage group membership in the identity provider rather than directly assign access to individual users. Various levels of access can be assigned, so it is possible that a user can have different access permissions to different spaces.

Managing Data files within spaces

Within each space is a file storage container called **data files**. Data files provides a virtual filesystem to manage and organize files, both created and used with Analytics and Data Integration solutions. Many customers like to use folders to manage content, and for customers who have previously used the Qlik Deployment Framework in a client-managed environment, Folder support is crucial to avoid significant refactoring when moving to Qlik Cloud.

Internally Data files has supported the creation and use of folders for several years. Recently this has been significantly expanded to provide full support via the UI for creating, organising and using folders. Folders are available for all types of spaces in Qlik Cloud.



Enterprise data at scale

Tenant resources

Each Qlik Cloud Analytics tenant provides a base capacity for analytics apps with the ability to increase this if required. The subscription type determines the base capacity available. With a user-based subscription, each Qlik Sense app can consume up to 5 gigabytes of memory, while a capacity-based subscription provides up to 10GB. Qlik Cloud Analytics scales to meet the demand that is required by user demand with no configuration needed.

Case study – Performance impact as data volumes and users increase

At Qlik, we have a dedicated team focused on the performance and scalability of our platform. As part of that process the team benchmarks typical scenarios that our customers face to ensure Qlik Cloud Analytics performs at scale.

Recently, we benchmarked a typical sales app, looking at the performance with transaction volumes of 10, 50 and 100 million records. We evaluated how the application performed as the number of users increased over time and as we can see, performance actually improves with more users due to intelligent caching by the engines.

Response times as volumes increase

Users	10	50	100	200	300	400	500	750
PT10	364	102	103	92	95	97	94	97
PT50	388	149	122	213	195	205	203	219
PT100	403	321	330	367	378	387	400	467

To achieve these results, Qlik Cloud automatically monitors the resource usage in the engines and allocates more engines as needed, ensuring adequate resources are always present to provide for user demand. When this occurs there may be a temporary increase in response times as the cache in the new engine needs to populate, however the impact of this is relatively short and the performance soon stabilizes.

Behind the scenes, we can see Qlik Cloud allocating those engines as needed. There are no limits on the number of engines that can be allocated at the app or customer level and no manual intervention from either the customer or Qlik is required to achieve this. These tests were run in a standard production Qlik Cloud tenant in the US. While these tests are reflective of how Qlik Cloud operates for all users and applications, actual results will vary based on the individual application and usage patterns.

Engines allocated in response to load increasing

Users	10	50	100	200	300	400	500	750
PT10	2	3	4	4	4	4	5	6
PT50	2	-	-	3	4	5	5	6
PT100	3	4	4	5	5	5	5	9

Large app support

Certain use cases may require apps that use more memory than is provided as standard. This is referred to as large app support. This capability is sold in packs of 20GB and 100GB. The capacity allocated to your tenant determines the maximum app size you are able to utilize in a single app up to a maximum size of 50GB. Reloads sometimes use more memory temporarily, and this is taken into account as part of large app support. Should high user volume require more resources, additional engines will be allocated to handle this load.

If a customer is allocated a single 20GB pack, they can open an app up to 20GB, and with 2 packs either an app of 40GB, or two apps of 20GB. Purchasing over 50GB, either in 20GB or 100GB packs, does not increase the maximum size of a single app beyond 50GB, but does allow multiple large apps to be opened simultaneously. If an app is not opened and is not being reloaded it will not consume this, so customers only need sufficient resources for their concurrent usage.

Expanded storage options

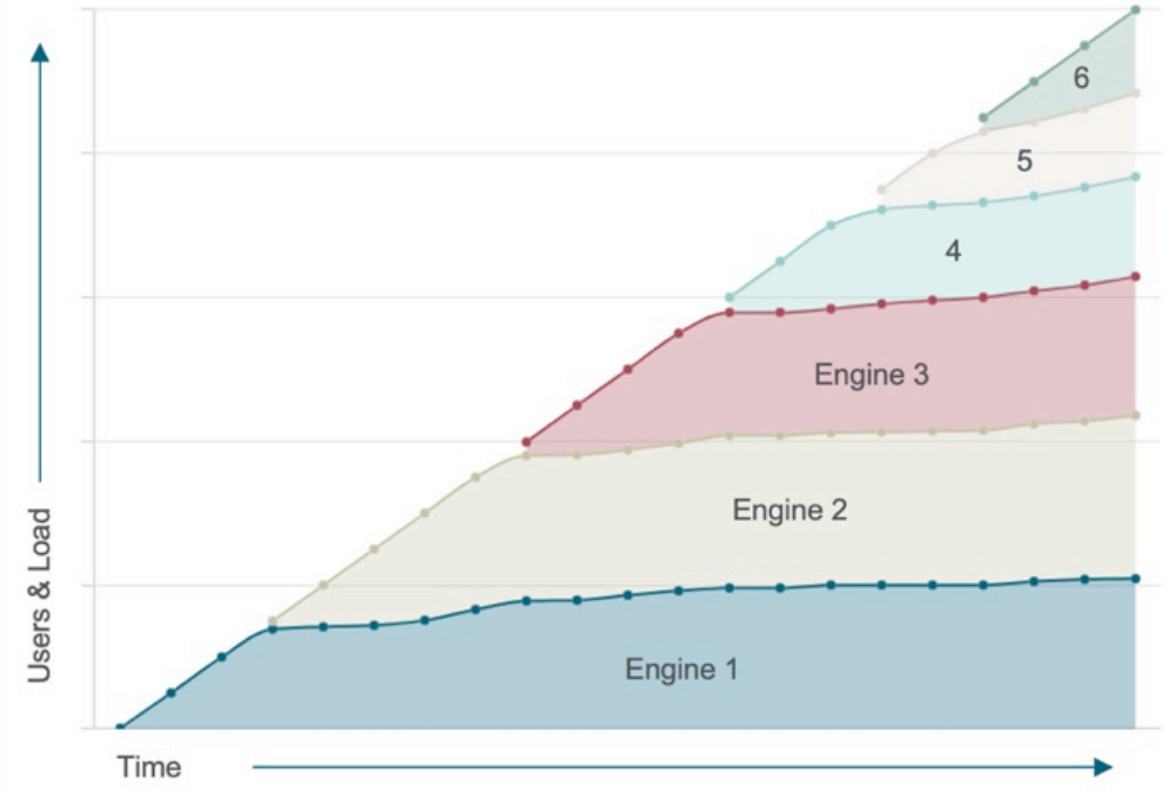
Qlik Cloud Analytics supports integration with enterprise storage solutions such as SFTP, AWS S3®, Google Cloud Storage® and Azure Storage® to enable access to a customer's own storage assets. We also support a number of consumer file storage solutions such as DropBox® and Google Drive®.

A common scenario for external storage is sharing content between multiple Qlik Cloud tenants, or between a client managed environment and your Qlik Cloud tenant. For example a customer who is using Qlik Sense Client managed to generate QVDs, could write those to external storage which is then consumed by you Qlik Cloud tenant. Over time the client managed applications generating QVDs could be moved to SaaS without having to change the downstream applications reading the QVDs.

Automatic scaling to meet user load

When using client-managed deployments on-premises or in a public cloud , customers are required to estimate and size infrastructure for their peak usage. This is a complex process and often customers either under or over resource for peak usage times, leading to poor performance or unnecessary cost. Often these resources are only needed for very short periods to deal with daily or weekly peaks.

How Qlik Cloud Analytics scales as user load increases

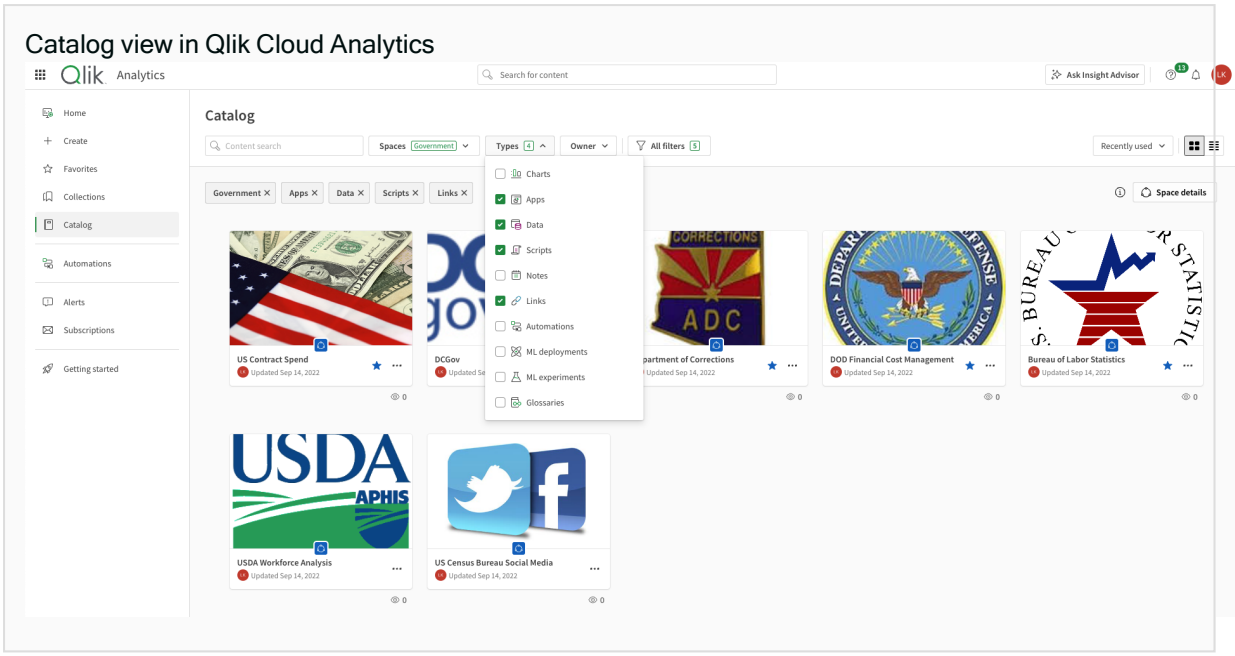


Qlik Cloud Analytics removes the complexity and costs of estimating, procuring, running and managing infrastructure because it is included in the subscription. More importantly, user satisfaction is higher as dealing with increased load is instantaneous, not subject to delays of procurement, installation, and configuration of infrastructure.

When a user accesses an application in Qlik Cloud Analytics, we initially check if the application is already open on one or more engines. If it is not, or these engines are already under heavy load, Qlik responds in turn by providing additional compute engines dynamically and opening another copy of the application. This autoscaling requires no configuration, management or extra expense from the customer and is transparent to the user. When the resources are not needed, Qlik with reduce the number of copies of the application open. This is true for both standard and large apps.

Managing data assets

Qlik has introduced cataloging capabilities through the catalog tab in the top menu of the Qlik Sense Hub. Switching to the catalog browser view allows users to create and easily navigate spaces, manage space permissions, and view and find content from one place. Enter keywords and/or select filters to locate charts, apps, data, notes, and links. Users can also view the content by owner creator and tag making it easier and faster to manage content and find what is needed, when it's needed.



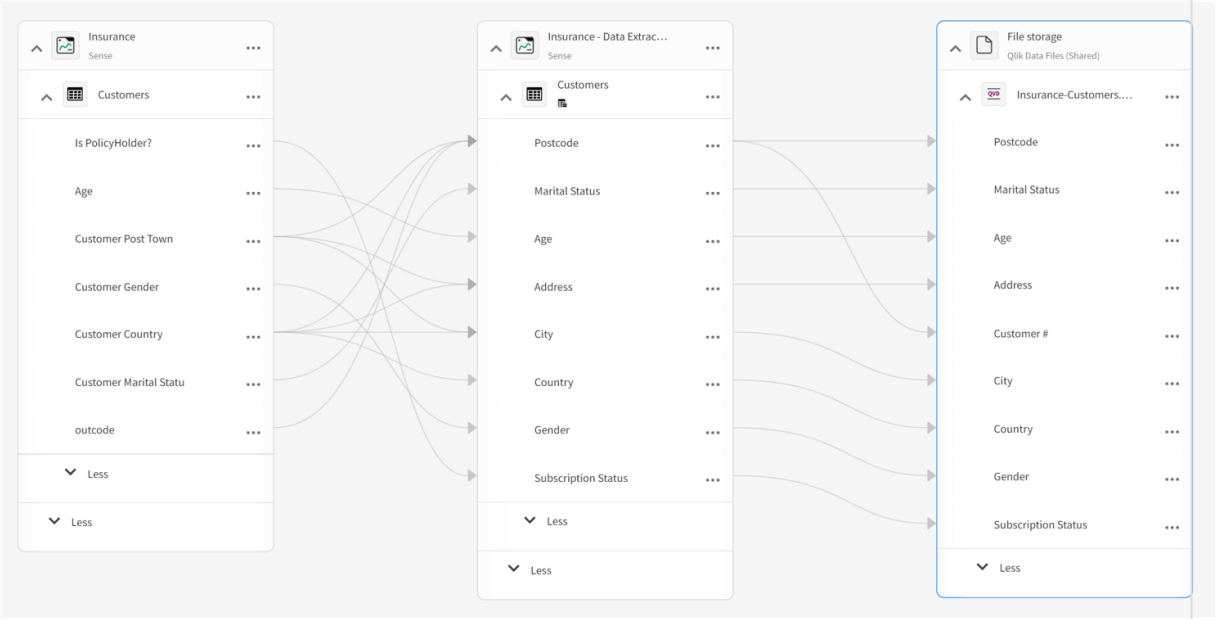
Searching and filtering can be done from the top menu or for additional detail, a vertical pop-out panel is available. A primary benefit of the design is the ability to multi-select the type of objects that users want to filter. Look soon for catalogued master items, business models, and more. Lastly, the Catalog content browser has been developed as a micro-component. Look for this rich search and browsing experience within Data manager of a Qlik Sense application.

Data lineage and impact analysis

The data lineage process identifies and documents data from its source to target, noting any changes as it moves through your data lifecycle. Using Qlik's lineage connectors, Qlik automatically finds and documents any relationships between datasets and across multiple BI tools. This lineage provides visibility on the source and journey of each dataset.

Qlik lineage connectors expand Qlik impact analysis capabilities to include traceability information from multiple BI tools and data sources.

Examining the lineage of a table in Qlik Cloud Analytics



Qlik supports lineage information from Qlik's client managed products, some third party BI tools, data files, and databases.
Field-level lineage allows for detailed investigation into how fields have been calculated and their specific origin across transforms and applications. While you explore the lineage, you can interactively change the base node to another table, application, or field on the screen to focus your investigation.

Downstream lineage is called impact analysis because it analyzes which objects will be impacted by changes to your data; these objects are the dependents of the base node. Qlik Cloud provides information and counts by type of dependent objects in a summary view.

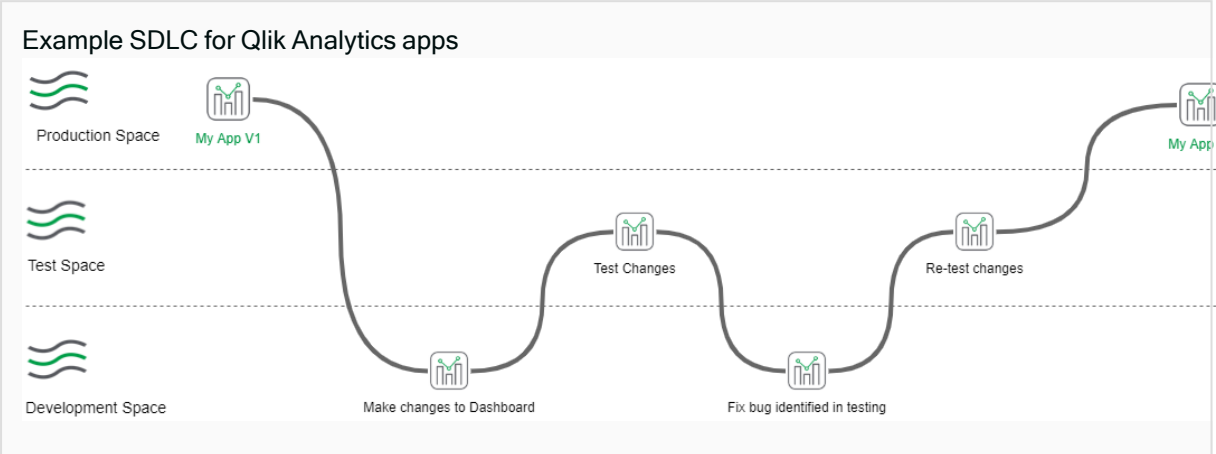
Business users examining a given field will have an aggregated summary of downstream impact that delivers insight into:

- Which object types would be impacted by a change to this field including databases, file storage, apps, and links
- What is the number of direct dependencies and indirect dependencies by type
- Who are the owners of the items that are impacted if you make a change

Move apps through a development lifecycle, not development servers

In a traditional BI environment apps would be developed on a development server. Once development was complete, they would be moved to a test server. Issues found in testing would mean several iterations of this process until the application could be deployed to production, requiring a lot of resources and infrastructure to manage.

With Qlik Cloud Analytics, apps are stored in discrete spaces. Each space has its own security settings, data connections and file storage. Customers can create as many development, test, and production spaces as needed to suit their software development lifecycle. This approach allows much greater flexibility, agility and reduced infrastructure expense than with a traditional on-premises setup.



In the above example, users consume the app in the production space. When a change to the app is requested, a copy is made in the development space and is published to the test space when ready for app testers to review it. Several cycles may occur until the app is ready to be released to production. To facilitate these flows, each space has its own data connections and file storage, so that an app will load the appropriate data for the applicable life-cycle phase.

Integrating data with Qlik Cloud Analytics

Qlik understands that while many organizations are moving their systems to the cloud, there will always be some systems such as mainframes, that remain on-premises. Additionally, some customers choose to migrate some systems to private clouds that are not directly accessible from public SaaS environments. Consequently, Qlik Cloud Analytics provides several solutions to integrate with a customer's data, whether that is on-premise, or in the private or public cloud.

Qlik's Connector Factory

Straightforward access to a customer's data is a key requirement for analytics. In a quickly changing market with many new players, especially in the cloud space, adding support for these sources in a timely manner is a key requirement. To address this Qlik has introduced Connector Factory. This initiative within Qlik leverages our own expertise as well of that of our technology partners to close these gaps as soon as possible for our customers. Through this initiative, Qlik plans to deliver over 100 new connectors in 2023.

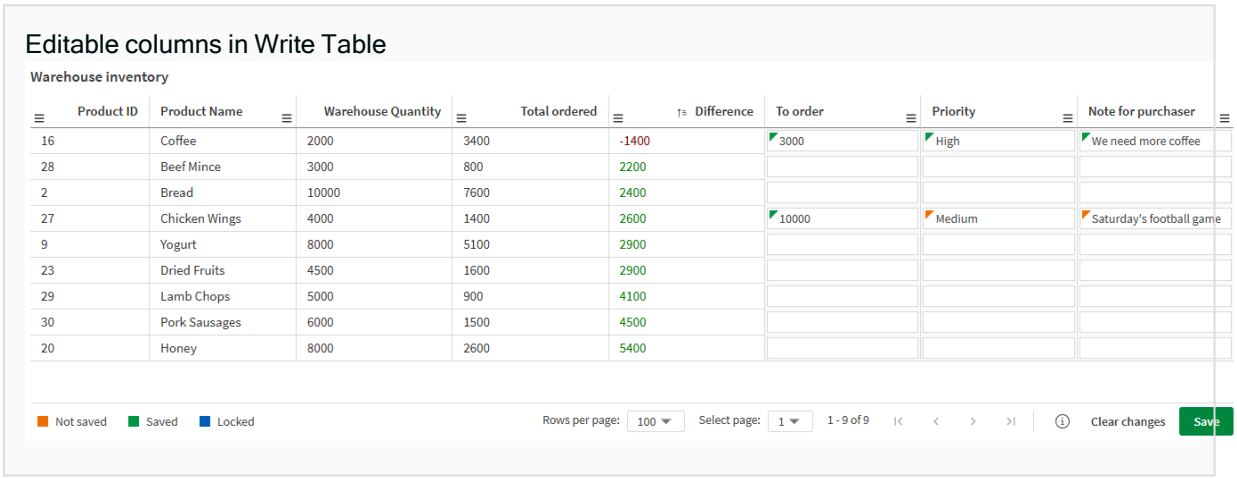
Working with files

While we will often load data directly from a database or cloud system directly, there are times when we need to work with files. Qlik supports many common file formats such as Excel (XLSX), CSV, XML and Parquet. Files can be read directly from Qlik Cloud's own data file storage, or from our file connectors such as SFTP, S3, Azure Storage, and Google Cloud Storage, to name a few. Qlik also supports its own format, QVD, which is highly optimized for fast loading.

Qlik apps also allow files to be written to Qlik Storage and to file connectors. This can be useful where data is to be used for multiple applications, and where we wish to create curated data sets for use by others. Files can be stored in text, QVD, or Parquet formats.

Write Table

Write Table introduces an editable table chart that lets you update data, add context, validate decisions, and collaborate directly within your analytics apps without reloads. Your changes can be used by analytics developers to implement automated, real-time processes and ensure data quality. Changes are stored for 90 days in the change store. If you need to back up these values, use Qlik Automate or load scripts to extract these changes to external systems or QVDs in Qlik Cloud. The changes saved in the change store can be extracted by using the Change Store blocks in the Qlik Cloud Services connector in Qlik Automate.

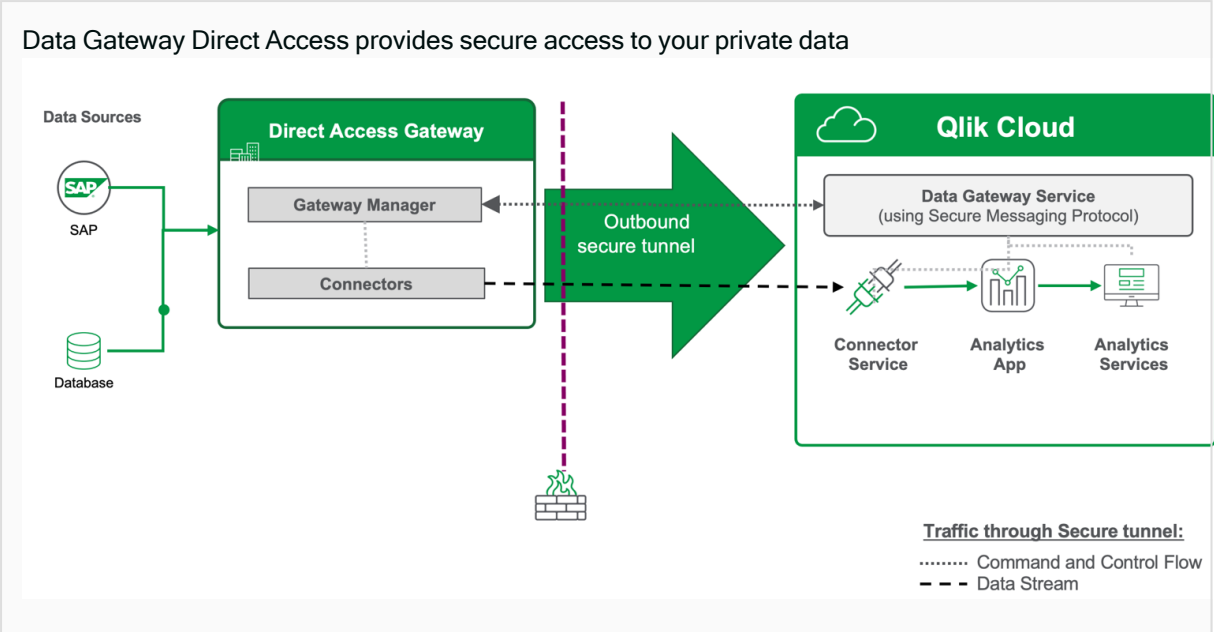


Qlik Data Gateway - Direct Access

Businesses commonly enforce strict firewall policies that block external access to their data sources, whether on-premise or in a private cloud deployment. This presents a challenge when such businesses need to access their data from the cloud for analytics.

In the past customers had to choose between pushing this data to Qlik Cloud using tools such as Qlik Data transfer or Qlik Talend Data Integration (see below) or opening up connectivity to these systems to Qlik cloud through their firewalls. For many use-cases none of these options are desirable.

Qlik has introduced the Qlik Data Gateway for direct access to overcomes this challenge by eliminating the need to open inbound firewall ports.



Qlik Data Gateway for direct access allows Qlik Sense SaaS applications to securely access on-premises data via a data gateway. The gateway is installed in a customers data center or private cloud and initiates an Outgoing secure reverse tunnel from the gateway to Qlik Cloud via an HTTPS (SSL 1.3) connection. Qlik cloud is then able to directly connect to the customers data sources in real time without any requirement to expose these data sources externally. Authentication for the gateway is managed though a JSON Web token (JWT) generated by the client which must then be stored in Qlik Cloud. Authorization for the gateway is managed by assigning a gateway to a space, then controlling access though authorization on that space.

Gateways should be deployed physically close to the data sources being consumed. Customers can set up as many gateways as they require. This allows customers to support different parts of their organization, whether separated by geography or security policy. Gateways do not need to be able to contact each other (and are not aware of each other); they only need to be able to connect to the data sources and to make an outbound connection (though a web proxy if required) to Qlik Cloud.

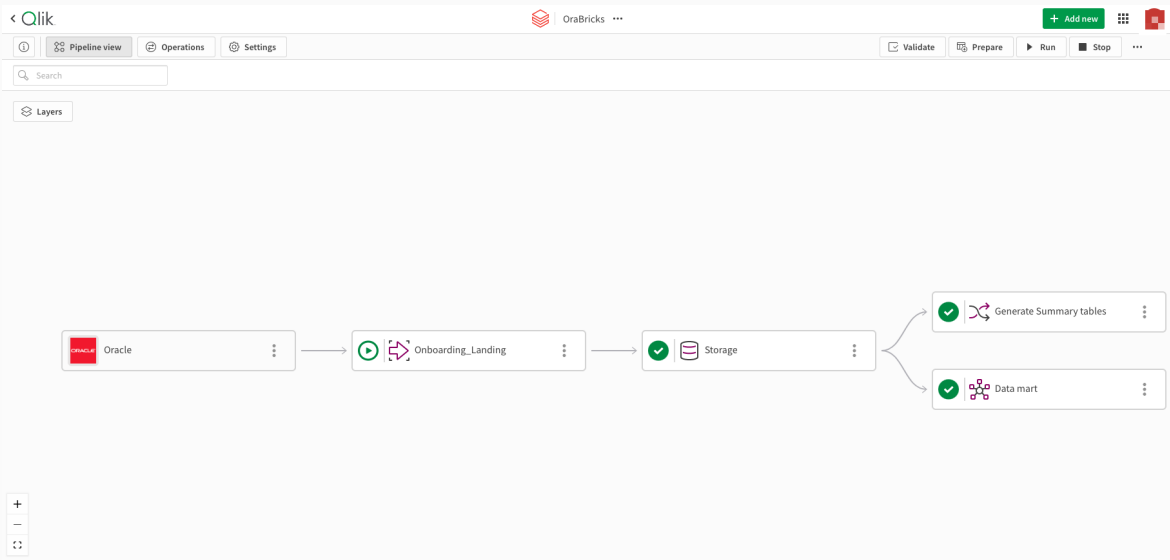
As well as most of our standard SaaS Data connectors, Qlik Data Gateway - Direct Access supports ODBC connections on the host where the gateway is installed. This allows access to any data source a customer has an ODBC driver for, even sources Qlik does not provide explicit support for that data source. The Gateway can also access file systems either directly on the host the gateway is installed on, or those mapped to that host. For more information on accessing files thought the gateway, see Qlik's Data Integration products.

Qlik Talend Data Integration

Qlik Talend Data Integration is Qlik's hosted and managed Integration Platform as a Service (iPaaS). Our vision is to provide a broad variety of data integration services aimed at helping users move from passive to active BI. A brief summary of Qlik Talend Data Integration is provided below. For more information, see the Qlik Talend Data Integration evaluation guide.

Qlik Talend Data Integration continuously streams data in near real-time from on-premises systems, such as relational databases, mainframes, and SAP systems to the Qlik Cloud tenant. QVDs created by the services are automatically updated whenever the source data changes and are ready for consumption by analytics apps without the need for scripting.

A data pipeline in Qlik Talend Data Integration



Qlik Talend Data Integration consists of:

- Landing - Landing transfers data from the customer's source to target environments. Landing can be either via the data movement gateway, or direct from supported cloud sources. Where the target is Qlik Cloud, this must be landed via Amazon S3.
    - Qlik Data Movement Gateway - The Qlik Data Movement gateway is a lightweight agent which runs in a customer's environment replicating data to a target environment. Targets could be Qlik Cloud (where data is published to QVD files for analytics consumption), or cloud storage, Data warehouses or Data Lakes.
    - Cloud sources use Qlik Connector technology to directly access cloud sources for ingestion into a customers targets.
- Storage - The storage data task consumes the data that was landed to the cloud landing area to generate datasets ready for use or transformation.
- Transformation - Transformation provides row level actions against your data set and allows you to create reusable transformation data tasks. Transformations can create materialized tables or views depending on your requirements. Simple transformations could be used to concatenate columns, run functions against a column or rename columns. For more complex operations SQL based transformations can be used.
- Data marts - Data marts can be created from either storage or transform tasks, or a combination of both. Data marts are star schema based.

Qlik Data Integration Platform (client-managed)

Qlik's Data Integration Platform is a bundled solution with components such as Qlik Catalog, Qlik Replicate,and Qlik Compose for Change Data Capture Streaming, Data Lake Creation, and Data Warehouse Automation, all providing the ability to publish data from a wide breadth of data source end points to cloud storage locations, such as S3 buckets and Cloud data warehouses. These can then be used by Qlik Cloud Analytics to load apps. Data Integration products which can be used with Qlik Cloud Analytics include:

- Qlik Replicate - Universal data replication and real-time data ingestion
- Qlik Catalog - A secure, enterprise-scale data catalog to easily find, prepare and deliver analytics-ready data
- Qlik Compose - Agile data lake creation and data warehouse automation

For more information on Qlik's Data Integration Platform, see: Qlik's Data Integration products.

API and script-based data integration

It is possible to move applications to and from the Qlik Cloud platform using either our APIs directly, or via the qlik-cli tool. Applications can be created programmatically, imported, published, and reloaded. They can also be exported with or without data, and many other operations.

Qlik Sense Enterprise Client-Managed for Windows

Qlik Sense Enterprise on Windows provides the ability to automatically synchronize Qlik Sense apps on-premises with Qlik Cloud Analytics. It is possible to use rules to tag which apps are distributed to Qlik Sense Enterprise SaaS, so only a subset of apps needs to be distributed. This feature allows customers to deploy some apps to Qlik Sense Enterprise SaaS and keep other apps on-premises and/or in a private cloud.

QlikView publisher

QlikView provides the ability to publish QlikView apps to Qlik Sense Enterprise SaaS through QlikView publisher. This capability allows QlikView customers to significantly reduce infrastructure costs while continuing to reload their QlikView apps on-premises.

Loading and preparing data in Qlik Cloud Cloud Analytics

Qlik provides several options to load data into Qlik cloud depending on the user persona and use-case. These are:

- Data flows
- Table recipes
- Qlik Scripts
- Data Manager in Qlik Apps
- The Data Load Editor in Qlik Apps
- the data marketplace
- The Data Catalog

Data flow

A data flow is an easy to use no-code interface for onboarding your data for use with Qlik Cloud Analytics. It provides a visual flow of your data as you prepare it for use. Processors allow you to transform your data from source to target, with all destination file targets supported. Data Preview lets you see the impact of your processing at each stage of your data flow.

A data flow in Qlik Cloud Analytics

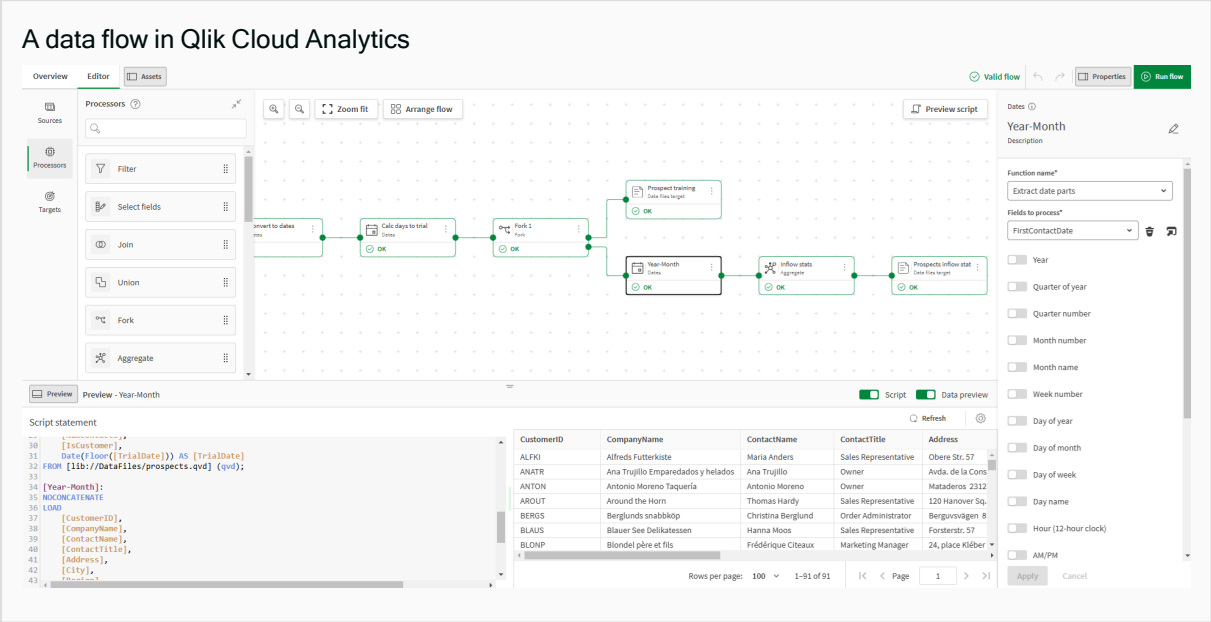
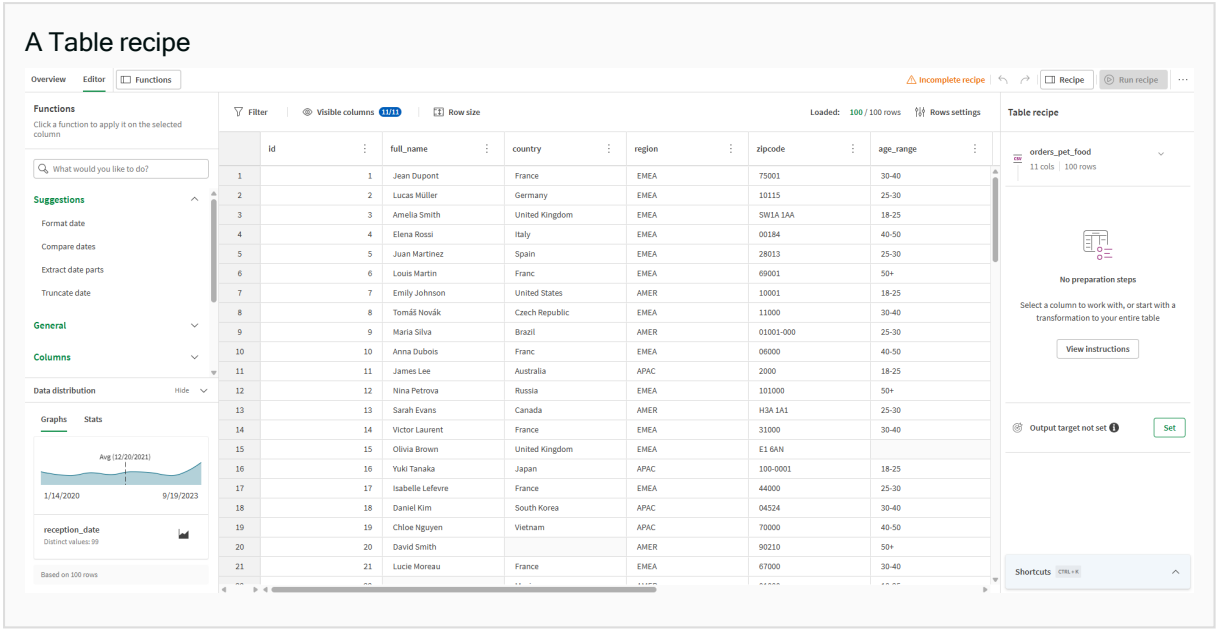


Table recipes

Table recipes provide a simple no-code data preparation tool aimed at single tables. Using a spreadsheet like interface, they make it easy for anyone to clean single table datasets fast and keep your insights flowing. Table recipes can also be embedded into larger Data Flow workflows to combine and shape multiple data sources. 60+ data prep functions are available for cleansing, standardizing, converting, splitting, masking, and formatting data.



Qlik Scripts

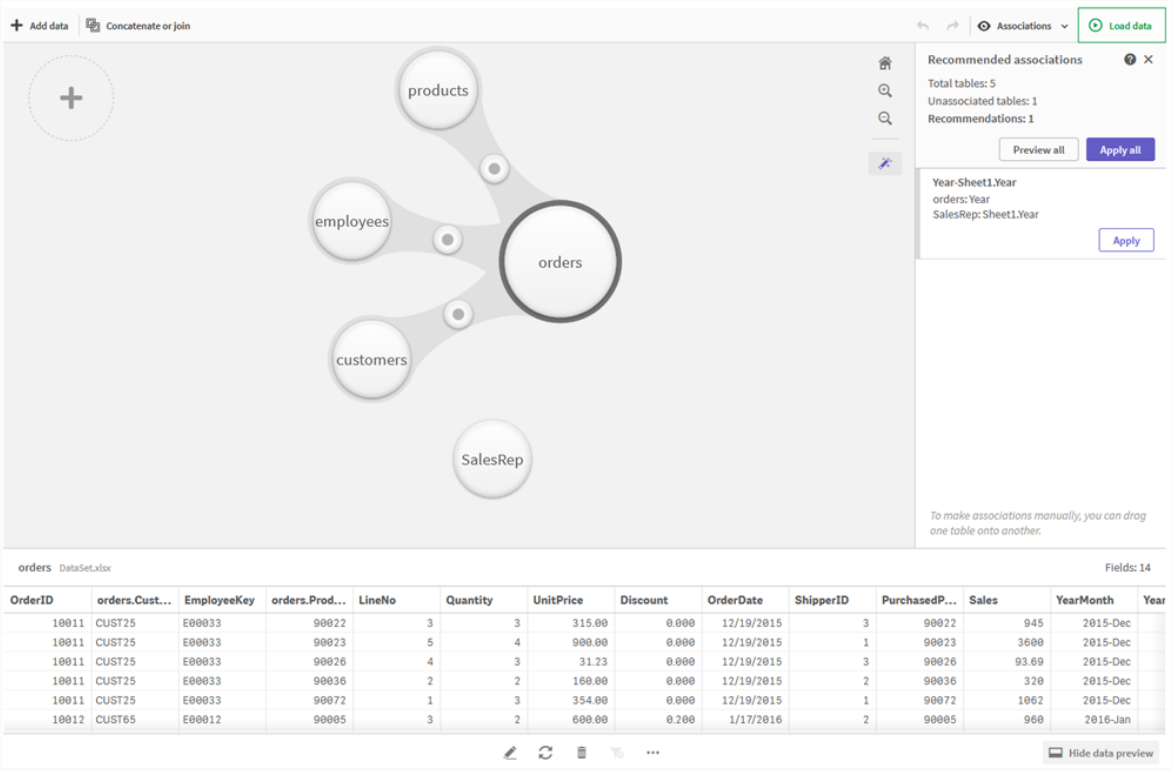
For more advanced data requirements, Qlik Scripts provide a powerful code-based approach to onboarding data. In the script, the fields and tables to load are specified. Scripting is often used to specify what data to load from your data sources. You can also manipulate the data structure by using script statements. Scripts provide automatic versioning with the prior 50 script versions kept.

See Understanding script syntax and data structures for more information.

Data Manager in Qlik Apps

The Data Manager is designed for non-technical users interested in exploring their data and building simple apps. It allows users to load and associate tables as well as perform simple operations like concatenating multiple tables and perform simple transformations. It is built into the Development interface of a Qlik App. Should users later whish to move to a more advanced interface, it can easily be converted to a Qlik Script in the Data Load Editor.

Associating tables in the data manager



The Data Load Editor in Qlik Apps

The Data load editor, part of the development interface of a Qlik App, is used to create data load script. In the script, the fields and tables to load are specified. Scripting is often used to specify what data to load from your data sources. You can also manipulate the data structure by using script statements. The resulting data structure of the data in the app can be monitored in the data model viewer. The scripting syntax is the same as that of Qlik Scripts created outside of an App, with the exception that when run in a Qlik App, the subsequent data model and data is persisted as part of the app, where-as external scripts can only create files to be used by other analytics functions. See Using the Data load editor for more information.

The Data Marketplace

The Data marketplace provides an inventory of your Data Products. A data product is an entity that allows you to gather, and package trusted datasets related to the same domain. Data Products are created within Qlik Talend Cloud, but are made available to be consumed for analytics via the Data Marketplace. A new app can be created from a Data product through the data marketplace.

Data Catalog

While Data Products contain groups of tables in the same domain, the data catalog presents individual tables to end users. The data catalog can be used within the Data Manager, or withing scripts either stand-alone of within the Data Load Editor.

2.5 Qlik Cloud Analytics architecture and governance

Building on the security and governance features of the Qlik Cloud platform, Qlik Cloud Analytics provides a number of features to enhance security and governance around the needs of an analytic environment.

Security for spaces and applications

Securing spaces

Security in spaces is controlled by roles assigned to members directly or via groups when they are added to a space. A role assigned to a member of a space gives that member a set of permissions inside that space and on resources inside the space.

The space owner has full access to the space. Creating a space automatically assigns that user as the owner. Owners can be changed through the spaces section of the management console.

There are different roles available between personal, shared, and managed spaces.

In a personal space, users are able to create their own connections, applications and other assets. This is managed through the Private Analytics Content Creator role. By default, all users with a professional user allocation are assigned the Private Analytics Content Creator role. Tenant administrators can turn off this automatic role assignment if their organization wishes to restrict users from creating personal content.

Shared spaces contain the following roles:

- **Can manage** - Provides full access and is similar to the owner, with the exception of making changes through the Data load editor or Data manager
- **Can edit** – Can create and modify applications including moving them to or from another space
- **Can view** – Can access applications in the space as well as adding private bookmarks and stories. Can also monitor visualizations from applications in the hub
- **Can consume data** – Allows users creating an application in their personal space, or in a shared space they have edit rights for, to consume data files and connections created in this space
- **Can edit data in apps** - Allows a user who is not the app owner to work on the app's load script

Managed spaces contain the following roles:

- **Can manage** - Provides full access and is similar to the owner, with the exception of being unable to publish/republish apps to this space
- **Can publish** - Publish/republish apps to this space
- **Can contribute** – Allows consumption and creation of private sheets in applications in this space
- **Can view** – Allows consumption of applications in the space including Monitor a visualizations in the hub, the export of data, creation of private stories, snapshots
- **Has restricted view** - Can view and open apps in the space. They can export sheets or charts as images and PDFs, but they cannot export data.

- **Can consume data** - Allows users creating an application in their personal space or another shared space they have edit rights for, to consume data files and connections created in this space.

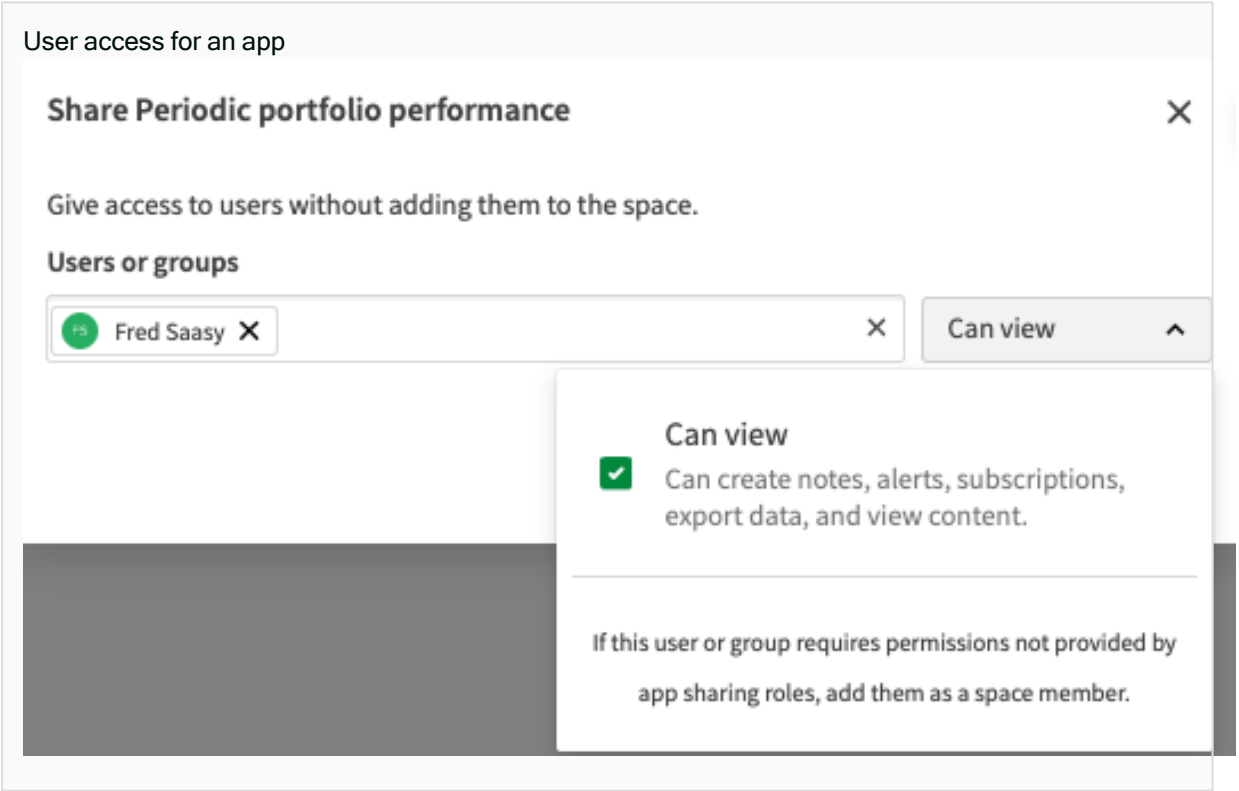
For more information about spaces, see Working with Spaces in the help.

Fine-grain access control

Admins and users now have more options and flexibility for fine-grain security, permissions, and sharing content within their spaces and individual apps. These enhancements allow customers to better scale and organize security permissions across large deployments while making it easy to invite others and share insights.

Space owners, facilitators, and admins can now directly share individual apps with any group or users without adding those users into the space. Shared users and their specific access controls can easily be managed from the Member section of the managed space.

User access for an app



Custom roles

Custom roles are a capability in Qlik Cloud Analytics that allows administrators to create granular, customized security roles. Custom roles can segregate development activities, allowing different teams to have limited access to certain functions.

They enable fine-grained control over permissions and access rights within Qlik applications and resources. Custom roles do not require recreating existing content, but do require an operational framework to sync users with the appropriate roles.

Section access

Section Access is used to control the security of an application. It uses the data model to define authorization at the data level and allows restricted access to data at row and column levels. For more information, see Section Access in the help.

Anonymous access to Qlik Applications

There are many use-cases for analytics where customers want to share information publicly, without requiring authentication. To support this Qlik provides Anonymous access subscriptions for Qlik Cloud Analytics. This provides the customer with a separate SaaS tenant to ensure there is no risk of accidentally exposing internal applications to the public. These tenants are hosted in special regions designed to handle the varying workloads that are common in anonymous scenarios, without impacting the performance of enterprise analytics use-cases.

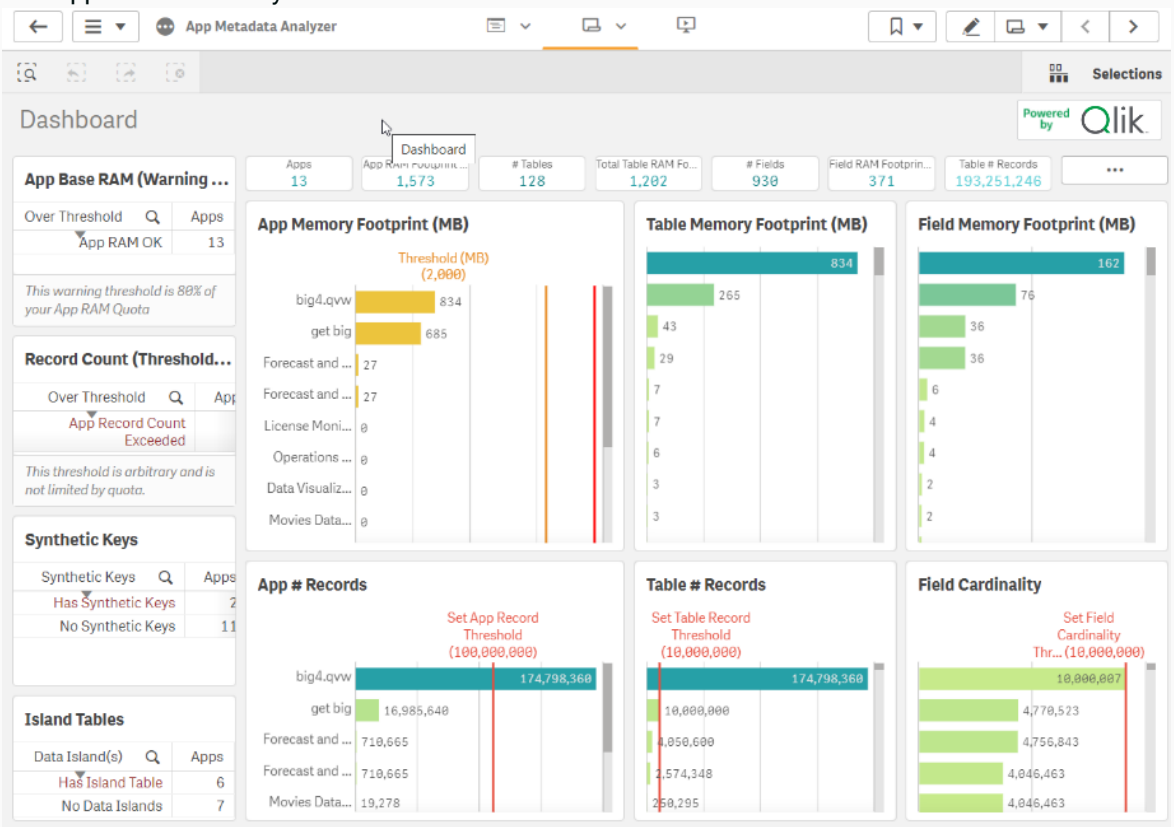
Governing the Qlik Cloud Analytics tenant

Application governance

Qlik provides several applications to assist customers in governing their Qlik Cloud Analytics tenant.

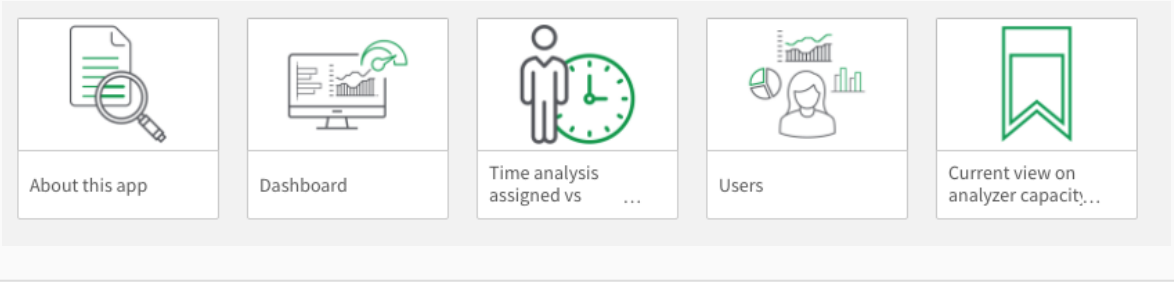
The **App Metadata analyzer** provides governance information about a customer's Qlik Cloud Analytics tenant. This app looks at key performance characteristics of apps such as memory usage, cardinality, and the data model.

The App Metadata Analyzer



The **Entitlement Analyzer** is available to assist in governing user activities. The app provides insights in areas such as an entitlement usage overview across the tenant, analyzer capacity usage and how users are using the tenant(s), and if they have the right entitlement assigned to them.

The entitlement Analyzer



The **Reload Analyzer** provides insights on:

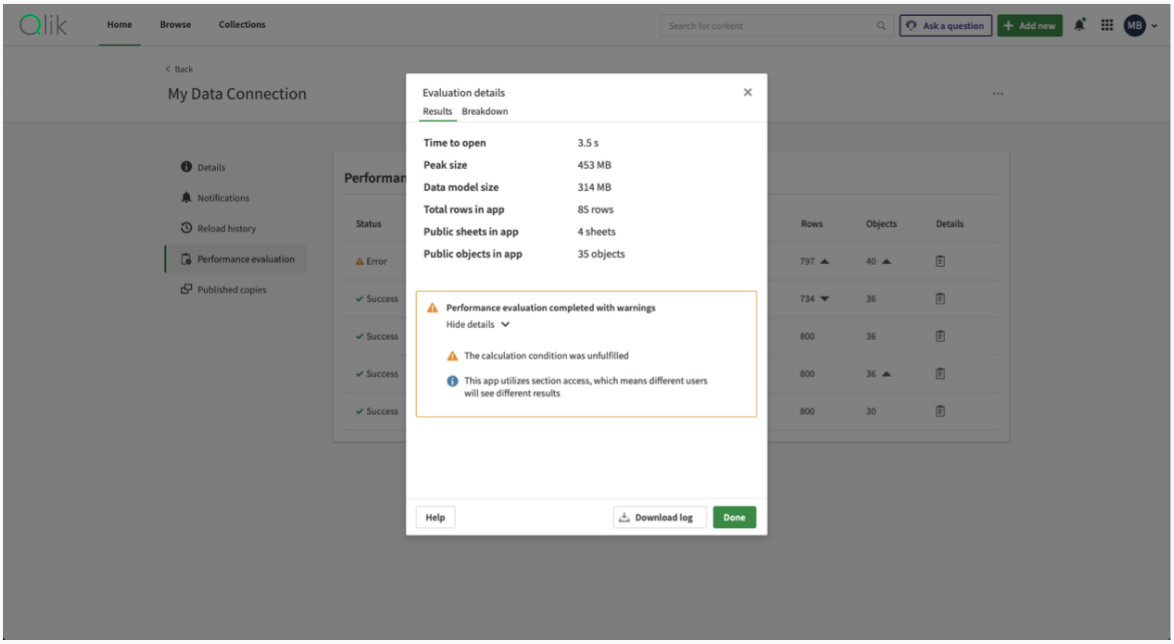
- Number of reloads by type (Scheduled, Hub, In App, API) and by user
- Data connections and used files of each app's most recent reload

- Reload concurrency and peak reload RAM
- Reload tasks and their respective statuses

At Qlik we are actively looking to provide improved governance options for our users, and share these through our support blog at Qlik Community.

Govern and enhance Qlik Sense applications with the App Evaluation service

The App Evaluation service

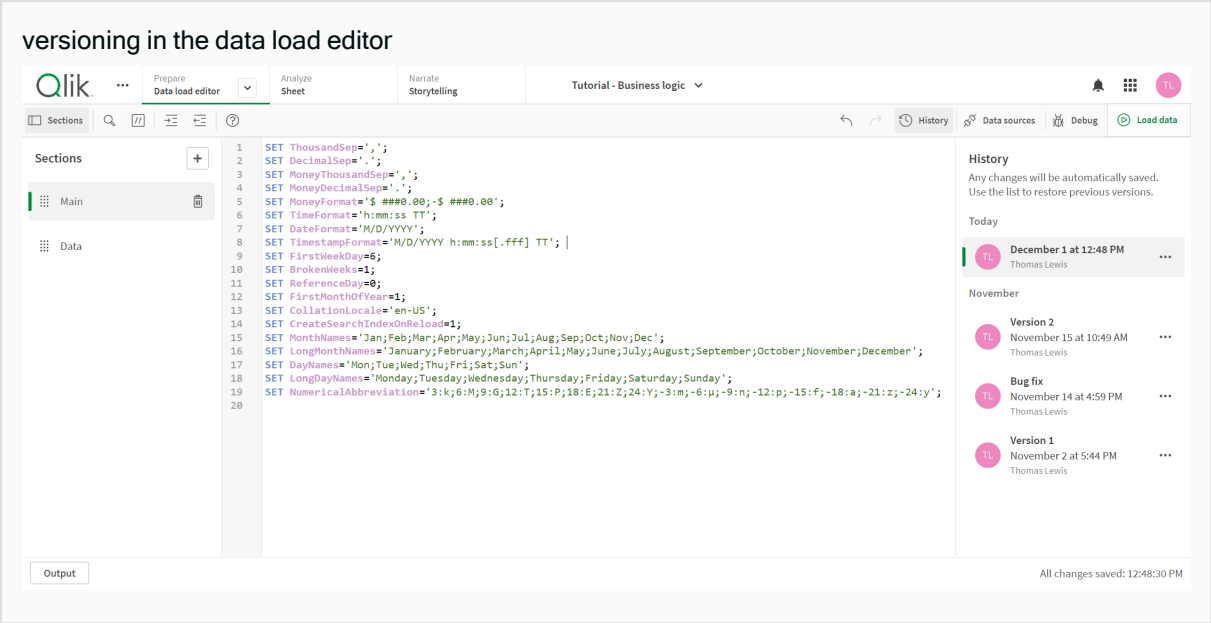


The App Evaluation service helps users manage their Qlik Cloud Analytics instance from a performance perspective. The service captures key metrics on Qlik Sense Enterprise SaaS applications, including increases in application size and length of time to open applications. Further, the service provides feedback on possible reasons for changes, allowing customers to address these issues.

Script versioning and auditability

The Qlik Cloud Analytics platform automatically versions the load scripts for apps. This shows the user who made the change and when the change was made. Optionally, we can also provide a version name to signify a specific event such as a release. In the event of a problem, we can roll back to an earlier version. We can also download specific versions of the load script to allow the use of external utilities to analyze changes over time. Currently this feature excludes scripts generated by the Data manager.

versioning in the data load editor



Extending Qlik Cloud Analytics security to mobile

While Qlik Cloud Analytics has always been accessible from any device via a web browser, Qlik has released a dedicated mobile app for IOS and Android to enhance the experience for mobile users. This application supports both live and offline access to Qlik Sense Enterprise SaaS applications, as well as Data Alerting.

Security is the key consideration in our mobile architecture. Authentication is through the tenant's identity provider mechanism and with stay authenticated for the duration specified by the identity provider. If enabled, a token is stored for offline access, which resets when the re-authenticated online.

Data protection is a critical aspect of our mobile security. All application and cache data stored on mobile devices is encrypted. As with a regular browser connection, traffic between Qlik Sense Enterprise SaaS and the mobile application is encrypted over SSL and secure WebSocket connections.

In the event of a lost mobile device, administrators can revoke access for that user. Should someone gain access to that device, they would not be able to use the application to see the applications and/or data.

When used in offline mode, Qlik Sense runs natively on the device using the same associative analytics engine running in Qlik Sense Enterprise SaaS, optimized for mobile hardware. Therefore, offline mode provides a full analytics experience, not simply a set of saved dashboard and reports.

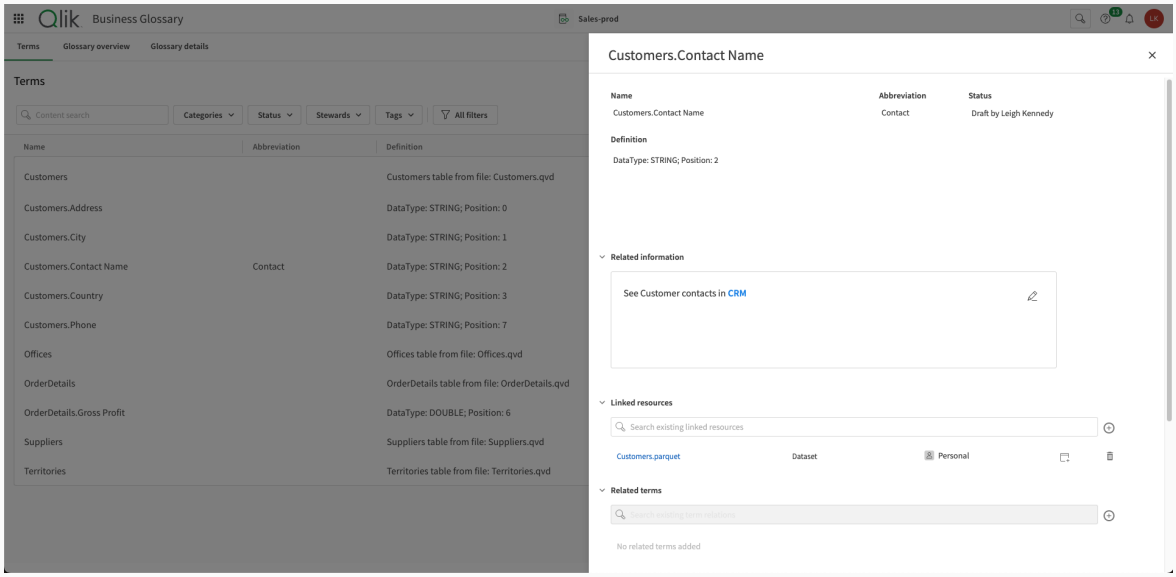
Customers can choose to disable offline access at the tenant level if they wish to prevent this. In this case, no application or cache data is persisted to local storage.

Business glossary

To provide users with a better understanding of the data available within their organization, Qlik Cloud Analytics provides a business glossary. The business glossary provides a single, easily-accessible repository of business terms and descriptions. This ensures that everyone in the organization has the

same understanding of key business terms. Users who subscribe to a business glossary will be notified of additions and changes to the glossary.

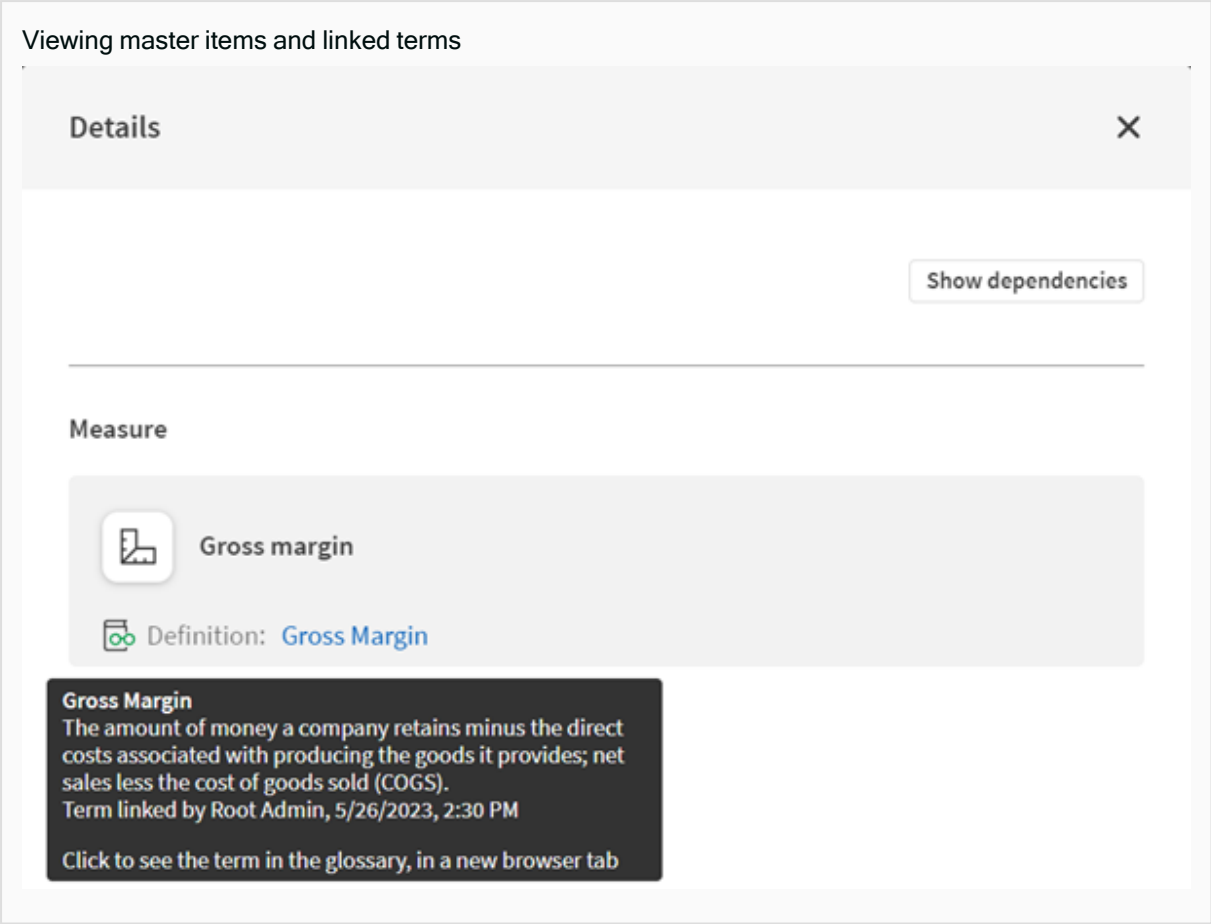
The business glossary



People in your organization who maintain the business glossary are known as data stewards. Data stewards need to be assigned the global Steward role. Any user with "Can view" permission can read the business glossary. Users with "Can manage" or "Can edit" permission can add or edit draft terms in the glossary. If the glossary owner approves the terms they can set them as verified. Terms can also be set as Deprecated. It is also possible to import and export business glossaries, allowing you to integrate with your dev-ops tools and move them through a your systems development lifecycle.

Terms from business glossaries can be linked to master items and used within apps. This provides users with a greater understanding and context of the information presented in a Qlik application.

Viewing master items and linked terms



2.6 Integrating and expanding Qlik Cloud Analytics

Integrating with your Qlik Cloud Analytics environment involves both integration at the Qlik Cloud platform level and with the Qlik Cloud Analytics features you wish to use, which is the focus here. This may involve application development, or it may leverage the features of Qlik Cloud analytics designed to share analytics to other environments.

For integrating with the Qlik Cloud platform, see the Qlik Cloud platform evaluation guide.

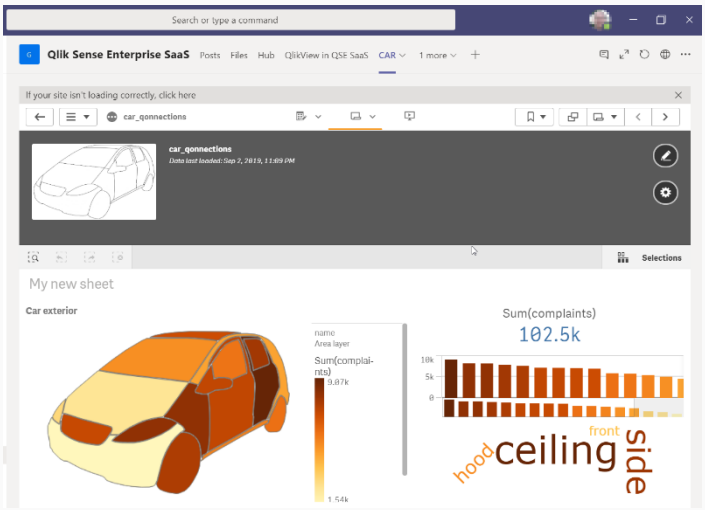
Integration approaches

Qlik Cloud Analytics supports a number of options for integrating Qlik hosted apps into a customer's own environment. For more information about authenticating to Qlik Cloud and securing embedded analytics, see Authentication in the Qlik Developer portal.

Embedding

Qlik Cloud Analytics apps support embedding in another web portal, or within a tool such as a third-party client. Read more about how to create mashups and web apps here: Create mashups and web apps

Embedded Qlik Sense app



Qlik also provides pre-built examples that customers can use to get started on embedding their Qlik apps and visualizations into their mashups and web apps. These examples are available on GitHub here: Web Integration examples

Webhooks

Webhooks let users integrate Qlik Sense into a workflow by using Qlik Sense system events to trigger actions in a workflow. A webhook is an HTTP callback that passes system event information in JSON format from one application to another. Webhooks can only be created by users with a tenant admin role. Here are some helpful ways to use webhooks:

- Whenever a new app is created, automatically notify the applicable team through Slack.
- When a new team member is added to a tenant, automatically send them a welcome email.
- When a user is deleted from the tenant, automatically update a spreadsheet.

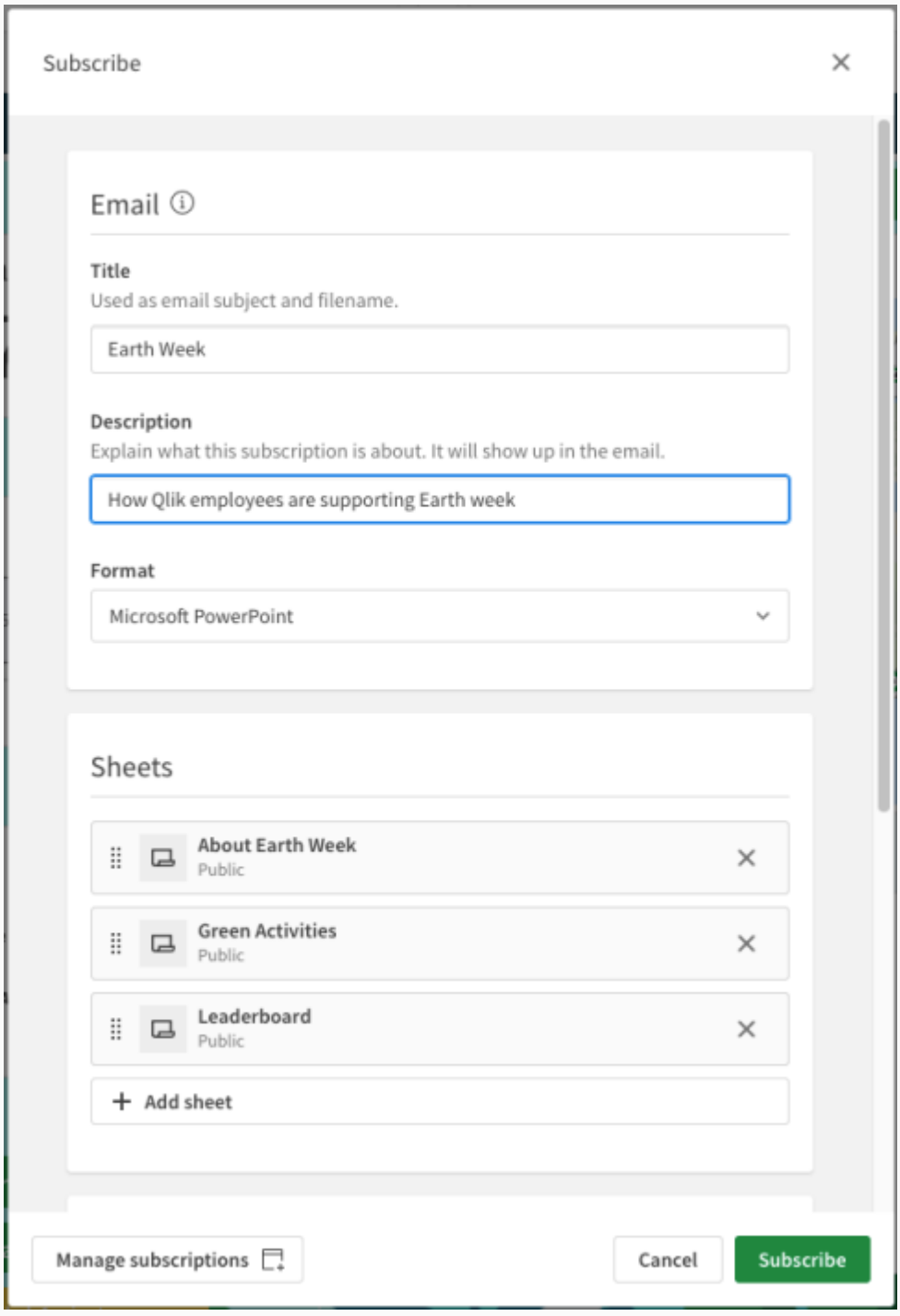
Reporting, Notification and alerting in Qlik Cloud Analytics

While interactive Dashboards and charts within a Qlik app provide a powerful solution to gaining insights from your data, there a times when creating and sending static reports is a requirement. This may be due to regulatory requirements, or a need to distribute to people outside your organization. You may wish to be notified when a certain condition is met in your workflow outside of Qlik Cloud. Qlik Cloud Analytics provides a number of features to provide analytics outside of A Qlik App.

Subscriptions

Sometimes you simply wish to publish the dashboards and sheet from your Qlik app to a static document and distribute this to your users. These basic reports can be created though the subscription feature of Qlik Cloud Analytics. A number of sheets from an app can be included and sent to report subscribers in either PDF or PowerPoint format. Reports can be scheduled or run manually as required. The subscriptions honor section access if configured in the app to ensure users only see what they are allowed to see.

Subscribing to a report



Reporting in Qlik Cloud analytics

To meet the need for certain types of flexibility in reporting, Qlik has introduced the several Reporting capabilities to Qlik Cloud Analytics. These include:

- Subscriptions
- In-app reporting
- Reporting using Qlik Automate

The Reporting Services are based on a set of APIs and related features that provide the ability to develop sophisticated multi-page reports that can be distributed to users outside of Qlik Cloud Analytics. All Qlik Cloud analytics customers have access to the Reporting service. The number of reports a customer can generate are determined by the customer's license.

Subscriptions

Subscriptions in Qlik Cloud Analytics Reporting Services allow users to schedule and automatically distribute reports to recipients via email. Subscriptions are designed for self-service reporting need for end users and do not require learning to use a report development tool. Key capabilities of subscriptions include:

- Sending reports of up to 10 sheets per subscription
- Scheduling report deliveries at specified intervals (e.g. daily, weekly)
- Generating reports in either PDF or PowerPoint

In-app reporting

In app reporting allows users to develop sophisticated reporting templates to be used for either scheduled reporting tasks or for on-demand use-cases.

- ***Tabular Reporting*** : Using Qlik's add-in for Microsoft Excel, Qlik Cloud Analytics provides highly formatted reports in XLSX format to support sophisticated reporting needs. Tabular reports supports section access. Report templates can be deployed in report tasks where they are combined with distribution lists and user filters (if necessary) to be be scheduled or triggered on app reload. Reports generated via report tasks can be delivered by e-mail or to Microsoft Sharepoint. For customers migrating from Qlik NPrinting, Qlik supports the export of Excel based templates which can be imported as Tabular Reporting templates.
- ***PixelPerfect Reporting*** : PixelPerfect Reporting provides an advanced report authoring capability in Qlik Cloud Analytics that allows users to create highly formatted and customized reports. It provides granular control over element placement and composition, enabling the creation of visually stunning reports that align with company branding. PixelPerfect Reporting caters to a report developer skill set, requiring expertise in designing pixel-perfect reports. It complements the existing tabular reporting capabilities in Qlik Cloud Analytics, offering an advanced authoring solution for highly formatted report output.

Key features of PixelPerfect Reporting include:

- Integrated report template designer with an intuitive interface for precise layout control
- Ability to incorporate Qlik Sense analytics and visualizations into the reports
- No dependency on Microsoft products or advanced deployment requirements
- Fully integrated into the Qlik Cloud Analytics in-app experience

Qlik Automate

Qlik Automate can be used to generate reports in PDF and Powerpoint format. Qlik App Automation supports the generation of multi-page reports sourced from the sheets and chart objects of Qlik Apps. Report generate through Qlik App Automation can be generated using content from one or more Qlik apps and can be distributed via email or a number of other connectors that Qlik App Automation supports.

Reporting via APIs

Customers can directly integrate the reporting service into their own solutions using APIs.

Notifications and alerts

Notification capabilities allow users to configure Qlik Cloud Analytics system-based events. These events include status of application reloads, and users' status in spaces.

Spaces are sections in the cloud hub where users can collaborate and set controls. Users have control over their notification subscriptions, managing by which channel (e-mail or web) they would like to receive them, as well as for opting to unsubscribe at any time.

Alerting capabilities allow users to configure alerts based on customer-defined business criteria relating to data in an application. Alerts are triggered to users during an application reload and can be set up to use a combination of dimensions and measures within an application. Alerts will apply the criteria solely to the data the user has permissions to access and may be delivered to the configured channel of choice (web or e-mail).

All users of Qlik Cloud Analytics can create personal alerts. Users with a Professional role assignment can add other users as recipients to their alerts, provided that all recipients must have access to the application to receive the alert. Qlik Cloud Analytics allows users to track alert history. This information is protected by AES-256 encryption and securely stored within Qlik Cloud.

All notifications and alerts can be configured to send through three channels:

- **Email**. Emails are sent using customer provided SMTP settings defined in the Administration Console and utilizing the Transport Layer Security (TLS) security settings from the customer's SMTP service. The same SMTP setting is shared across all features integrated with e-mail capabilities in Qlik Cloud.
- **Web**. Web notifications and alerts are delivered to the Qlik Sense web client browser over a secure HTTPS connection using TLS 1.2 AES-256 with signed digital certificates.
- **Qlik Sense SaaS Mobile app**. Alerts can be sent directly to users of the mobile app.

Qlik Open Source

In addition to API governance, Qlik R&D delivers libraries to accelerate development, testing, and integrating of the Qlik Cloud Analytics platform through Qlik Open Source.
A number of these first-party libraries are used in the platform itself, such as:

- **Nebula.js** - a collection of JavaScript libraries, visualizations and CLIs that helps developers build and integrate visualizations on top of the Qlik Associative Engine

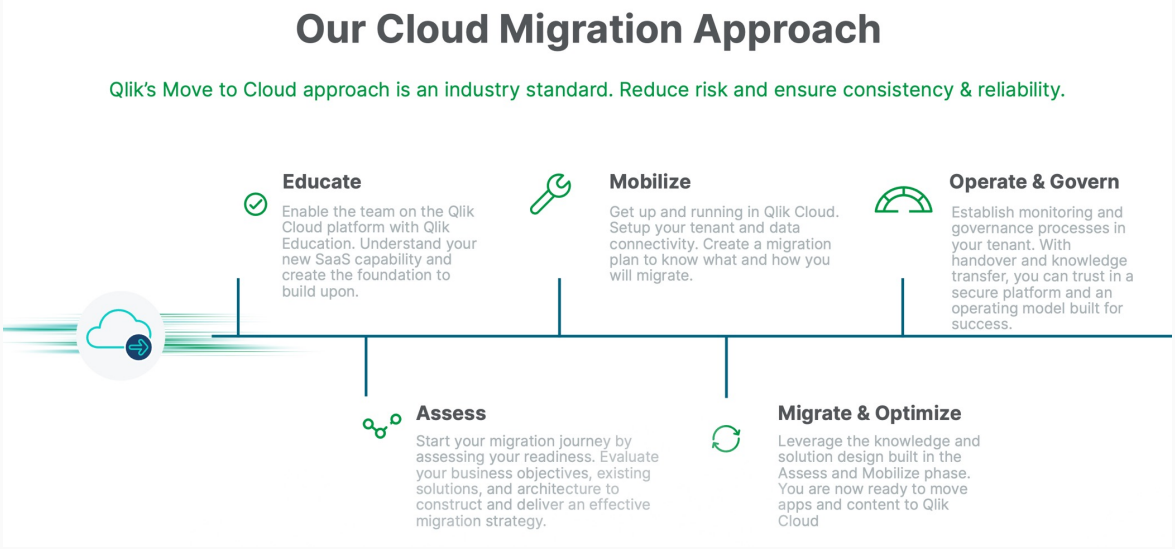
- **Enigma.js and Enigma.go** - JavaScript and golang libraries for consuming the Qlik Associative Engine
- **Gopherciser** - a load testing tool for Qlik Cloud Analytics

For more information, see Open source at Qlik R&D

2.7 Migrating to Qlik Cloud Analytics

Many long term Qlik customers are looking for the extra value and solutions Qlik cloud offers, but are concerned about the cost and complexity of migration. Migrating existing on-premises Qlik environments into Qlik Cloud helps teams unlock new capabilities while preserving valuable institutional knowledge and analytical insights. To make this easier for customers, we have introduced the Qlik Analytics Migration Tool.

Qlik Cloud Migration approach



Assessing your Migration journey

To assist Qlik Sense Client-managed and QlikView customers looking to move to Qlik Cloud, Qlik has created the SaaS Readiness App. The application is used with support from a Qlik Technical Field member or Qlik Partner to assist existing clients considering a move to Qlik Cloud Analytics It runs in your existing environments, gathering information on your Qlik assets. Features include:

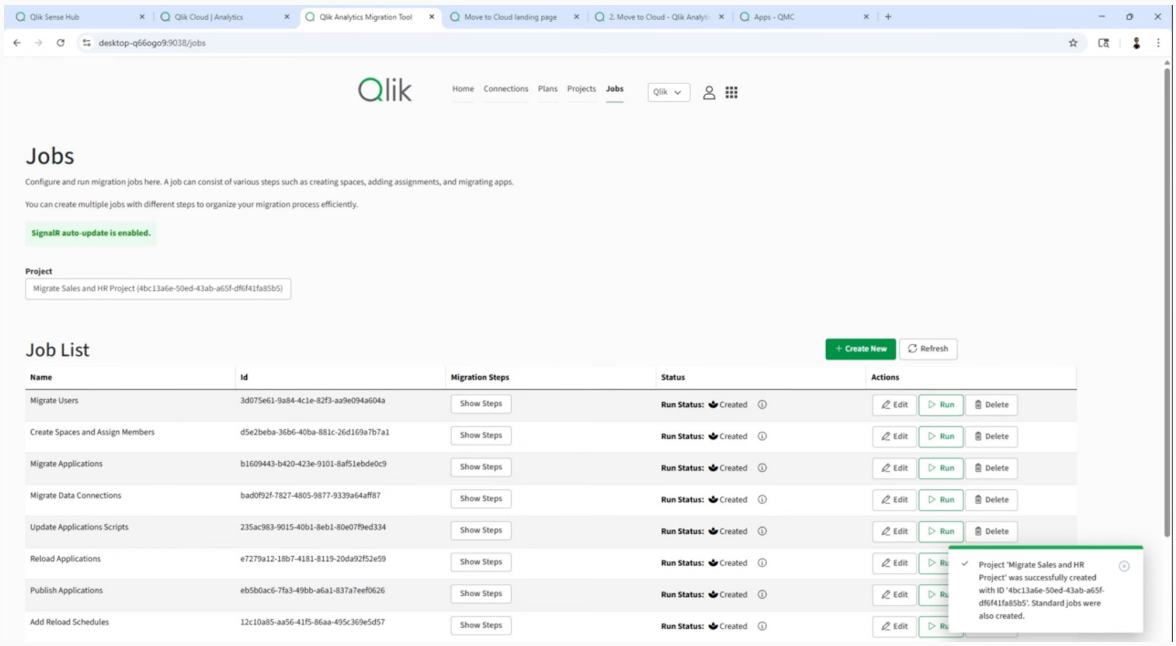
- Profiles usage, app size, and content inventory aligned to Qlik Cloud tiers
- Identifies high-use apps to migrate first
- Flags unused or oversized apps for cleanup or optimization
- Estimates Large App sizing for both user and reload consumption
- Enables focused, data-driven migration planning

Qlik Analytics Migration Tool

The Qlik Analytics Migration Tool is designed to support structured migration plans. It offers powerful automation, flexible controls, and guided workflows that make complex migrations easier to manage, one step at a time. The tool executes migration steps in a logical, traceable sequence, resulting in consistent, repeatable execution that adapts to your migration plan. It supports:

- Qlik Sense and QlikView
- Secure, phased, and governed deployments
- Customizable via plans, projects, and jobs
- Enterprise-grade validation and logging

Migrating from Client Managed to Qlik Cloud with the Qlik Analytics Migration Tool



To learn more about Migrating to Qlik Cloud Analytics and the Qlik Analytics Migration tool, see the Qlik Migration Center .

3 About Qlik Evaluation Guides

The content provided herein is provided for informational purposes. Due to Qlik Cloud's continuous release process, at times the content herein may differ from actual platform functionality. Please refer to Qlik Cloud Help for the product documentation for Qlik Cloud.

Any statement about future plans or intentions for the Qlik Cloud platform contained herein is not a commitment to deliver those features or functionalities, as the development, release, and timing of any features or functionality described for Qlik's products remain at our sole discretion.

For additional information regarding Qlik Cloud, please see Qlik Cloud or contact your Qlik representative.

3.1 Document history

This content has been developed to assist customers and prospective customers to understand and evaluate the Qlik Cloud platform and its related services. Traditionally this content has been published in document format only as a PDF; however, it is now primarily published as web content with PDF files available if required.

Over its history, this content has been known by the following names:

- Qlik Technical papers
- Qlik White papers
- Qlik Technical overview

This documentation supersedes the above documents.

3.2 Changelog

The PDF documents are generated from the evaluation guides at Qlik Help . The changelog for this evaluation guide is shown below.

Changelog – Qlik Cloud Analytics evaluation guide

December 2025

Integrating data with Qlik Cloud Analytics

- Add Write Table
- Removed Qlik Data Transfer

November 2025

Migration

- Add migration section
- Qlik Analytics Migration Tool

Analytics engine

- Rename of associative engine to analytics engine

October 2025

Q3 Updates

- Qlik Analytics Migration Tool
- Table recipe
- Custom groups
-

July 2025

Authoring

- Updates to reflect changes in Authoring Experience

May 2025

Qlik Connect updates

- Name changes and updated images

February 2025

Loading and preparing data in Qlik Cloud Cloud Analytics

- Data Marketplace, Data Flow & other updates

January 2025

Anonymous access

- Updated to cover anonymous access subscriptions

July 2024

UI and Qlik Answers®

- Updated to reflect the new UI changes to Qlik Cloud
- Added Qlik Answers® content

February 2024

February updates

- Updates to Reporting Services
- MS Teams integration

October 2023

October updates

- Collaborative notes in *A single platform for analytics*
- Business Glossary in *Architecture and governance*
- Case study - Performance in *Working with Qlik Cloud Analytics*
- Minor updates

August 2023

August updates

- Minor updates

July 2023

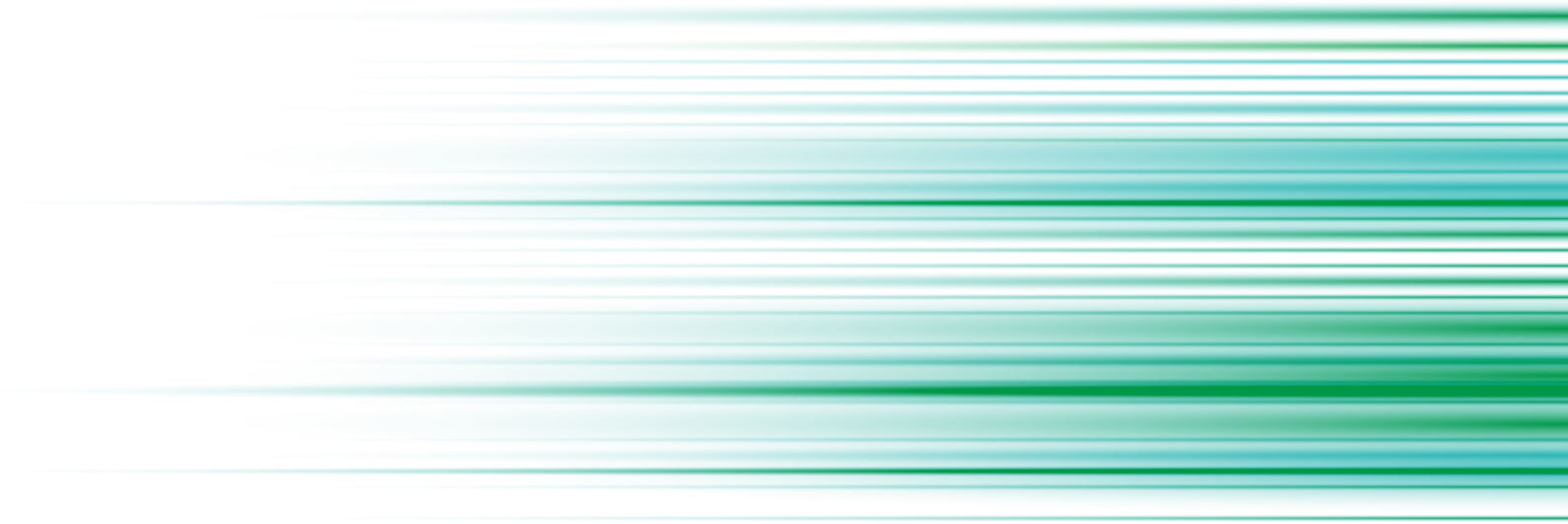
Initial release to help.qlik.com

Migration from static PDF to online content with PDF files auto-generated.

Feb 2023

Final legacy version

Last version published as a static document only.



About Qlik

Qlik's vision is a data-literate world, where everyone can use data and analytics to improve decision-making and solve their most challenging problems. Our cloud-based Qlik Active Intelligence Platform® delivers end-to-end, real-time data integration and analytics cloud solutions to close the gaps between data, insights and action. By transforming data into Active Intelligence, businesses can drive better decisions, improve revenue and profitability, and optimize customer relationships. Qlik does business in more than 100 countries and serves over 38,000 active customers around the world.

qlik.com