Qlik Sense®
Enterprise SaaS

LEAD WITH DATA™ **Qlik Q**

Contents

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 life-cycle 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-premise deployment.

Qlik Sense consists of Qlik-managed cloud-based solutions: *Qlik Sense Enterprise SaaS* & *Qlik Sense Business*, and a customer-managed solution: *Qlik Sense Enterprise Client-Managed*. The focus of this document is Qlik Sense Enterprise SaaS.

Qlik Sense Enterprise SaaS Overview

As part of Qlik's cloud first strategy we have developed our own cloud service, Qlik Cloud Services (QCS), on which we manage cloud editions of our product portfolio to deliver them to customers as software-as-a-service (SaaS) offerings. Qlik Sense Enterprise SaaS is our premium cloud solution and gives businesses world-class analytics without the complexities of installing and managing their own deployment.

A single platform for analytics

The microservice-based architecture behind Qlik Sense Enterprise SaaS allows us to host both Qlik Sense and QlikView® applications (apps) in a customer's Qlik Sense Enterprise SaaS tenant. This means users have a single location to open and consume their Qlik apps. In addition to hosting Qlik apps, Qlik Sense Enterprise SaaS 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.
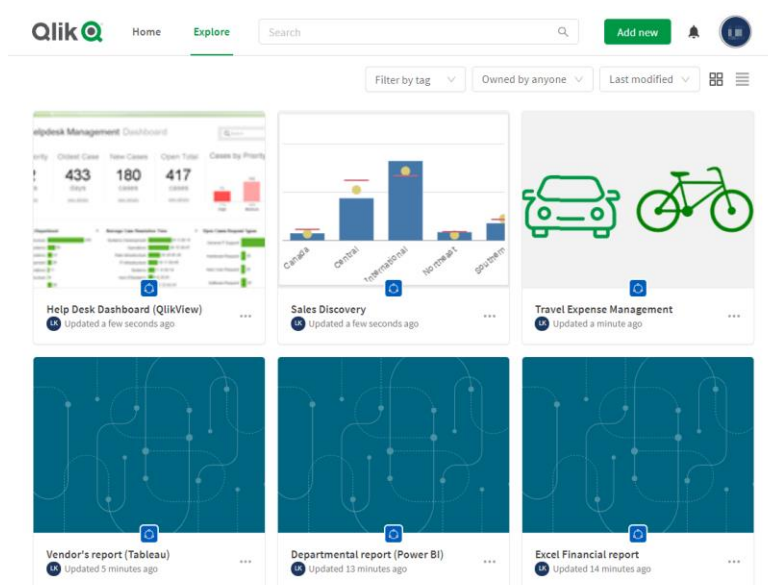
Associative, in-memory apps

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 users 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.

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 Sense Enterprise SaaS environment is through a zero-footprint web browser interface (known as the Qlik Sense 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.
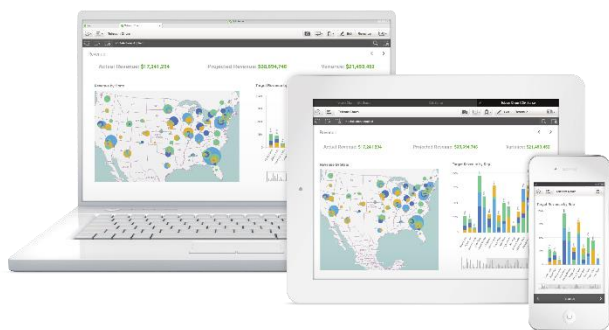
In addition to the web-based interface, Qlik Sense supports conversational analytics which integrates with major chat platforms such as Slack and MS Teams and data alerting capabilities to allow users to subscribe to and be notified of key changes to their data.

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 Sense runs on the unique Qlik Associative Engine, enabling users of all skill levels to explore their data freely without limitations. The Qlik Associative 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.

The Qlik Associative 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 25 years of innovation and investment.

Notifications and Alerts

Notification capabilities allow users to configure Qlik Sense Enterprise SaaS system-based events. These events include status of application reloads, and your users' status in Spaces. Users have control over their notification subscriptions, managing 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 Sense Enterprise SaaS 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 Sense Enterprise SaaS allows users to track alert history. This information is protected by AES-256 encryption and securely stored within QCS.

All notifications and alerts can be configured to send through two 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 QCS.

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.

Tenants, user roles & entitlements

Tenants

Each customer creates an instance of Qlik Sense Enterprise SaaS called a "tenant." Each Qlik Sense Enterprise SaaS customer has its own tenant.

Roles

There are three roles that users can have in Qlik Sense Enterprise SaaS tenants. The roles combined with the entitlements establish what access users have within a tenant.

- **User** – This role is given to anyone who has access to a tenant. It is implied rather than specifically granted. It is further broken down by license type:

    - Professional - Professional access is for users who need access to all features within Qlik Sense Enterprise. It is charged on a per user basis.

    - Analyzer - Analyzer access is for users who consume content created by others. It is charged on a per user basis.

    - Analyzer Capacity - Analyzer access is for users who consume content created by others. It is charged based on usage rather than at a per user fee.

- **Developer** – The developer role allows the user to create API keys. API keys are used for programmatic access to the tenant and for certain Qlik tools such as Qlik DataTransfer.

- **Tenant Admin** – The tenant admin role provides full access to the management console for management of all administrative aspects of a customer's tenant. There is always a minimum of one tenant admin.

- **Service Account Owner** - While not a role within the tenant, each tenant has a service account owner who controls initial setup, multi-factor authentication and billing. The service account owner is the initial tenant admin.

Spaces

Spaces are areas of the Qlik Sense Hub used to both develop and control access to apps, data files and data connections. There are three types of spaces:

- **Personal spaces** - Private work areas for each user in the Qlik Sense 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 Sense Hub that are used for providing access to apps with strict access control both for the app and the app data.
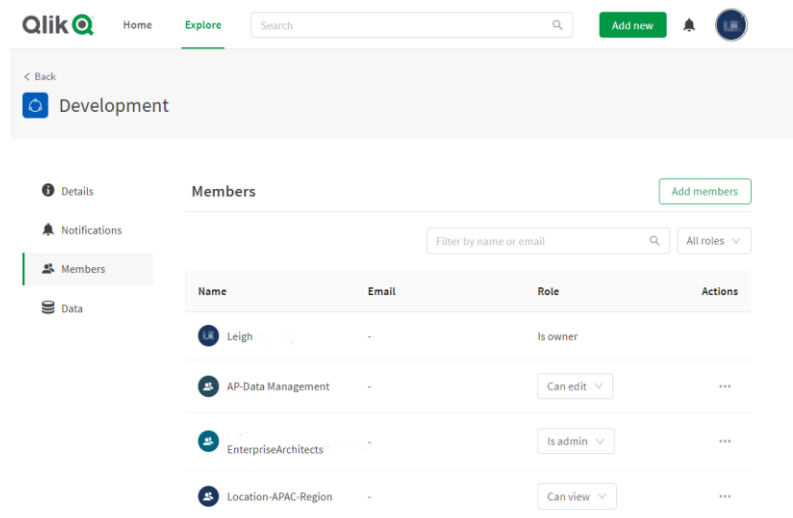
    Data Files & Data Connections in Spaces – Data Files and Data Connections, just like Apps, can also be stored and reused across the three space types.

Access to shared and managed spaces can be assigned either directly to 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.

Enterprise data capacity

Tenant resources

Each Qlik Sense Enterprise SaaS tenant provides fully expandable storage[1] and with a standard Qlik Sense Enterprise subscription, each Qlik Sense app can consume up to 5 gigabytes of memory. Qlik

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[1] Subject to fair use policy

Sense Enterprise SaaS scales to meet the demand that is required on system resources with no requirements on users to configure any of the infrastructure.

Expanded Apps and Dedicated Capacity

Certain use cases may require apps that use more than 5 gigabytes of memory. Qlik provides an Expanded Apps option for applications between 5 gigabytes and 10 gigabytes in memory. For apps larger than 10GB in memory, or workloads that require even larger capacities, Qlik offers a Dedicated Capacity option.

In addition, Qlik Sense Enterprise SaaS supports integration with enterprise storage solutions such as AWS s3 and Azure storage to enable access to your own storage assets. Please see the section _Integrate on-premise Data with SaaS_ for more details.

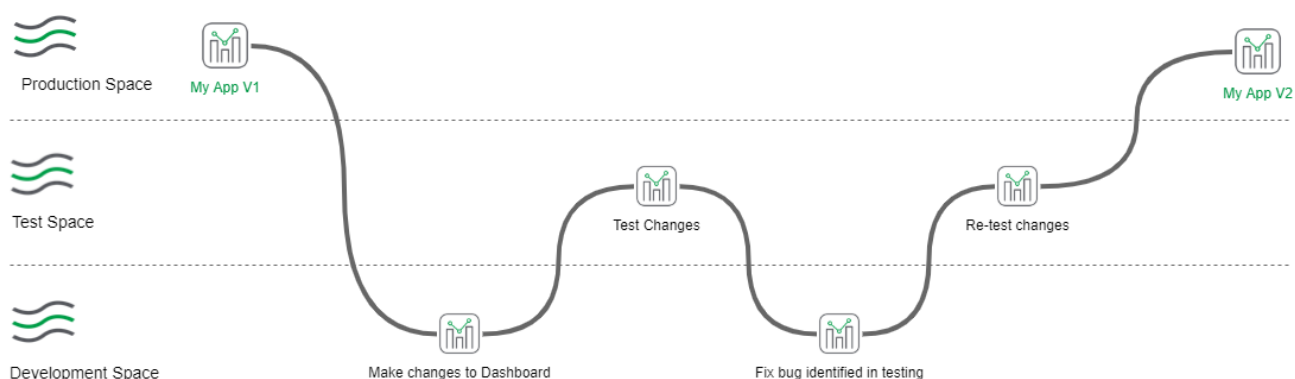## Focus on analytics, not infrastructure

One of Qlik's goals is to reduce the cost and effort customers spend managing infrastructure and increasing the time they have for gaining insights from their data. When running on-premise deployments, customers need to factor in several costs which are not directly related to solving business problems such as:

- Infrastructure capital and operational costs
- Operating system management and software licensing
- Staffing costs for infrastructure administrators

With Qlik Sense Enterprise SaaS, our customers can focus on solving business problems rather than administering their analytics environment. This both reduces the total cost of ownership of analytics and the time it takes to get to actionable analytics – what Qlik refers to as _minutes to insight_.

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 Sense Enterprise SaaS, 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 life cycle. This approach allows much greater flexibility, agility and reduced infrastructure expense than with a traditional on-premise setup.

Production Space — My App V1 · My App V2

Test Space — Test Changes · Re-test changes

Development Space — Make changes to Dashboard · Fix bug identified in testing

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.

Qlik Cloud Services zero-downtime deployment for updates

Another significant effort involved with on-premise software deployments, and even many SaaS offerings, is the need for customers to test and certify product implementations, migrations and/or upgrades, which can include side by side SaaS environments. Instead of requiring such time intensive efforts, Qlik utilizes the concept of zero-downtime deployments for our Qlik Cloud Services infrastructure.

Qlik's zero downtime deployments for Qlik Cloud Services allows Qlik Sense Enterprise SaaS to be upgraded or modified without affecting customers' usage. Qlik's work on the platform is transparent to customers. For more information on Qlik's cloud native architecture and how zero-downtime deployments works, please see the section *Qlik and Cloud Native*.

Integrate on-premise data with SaaS

Qlik understands that while many organizations are moving their systems to the cloud, there will always be some systems that stay on-premise, such as mainframes. There are also many customers choosing to move some systems to private clouds not directly accessible from public SaaS environments. Therefore, Qlik provides several solutions to integrate on-premise data sources with Qlik Sense Enterprise SaaS.

Qlik DataTransfer™

Qlik DataTransfer is a lightweight utility that is included in Qlik Sense Enterprise SaaS and securely pushes on-premise data and local files to the cloud. It is designed for customers who do not require either a full data integration solution such as Qlik Catalog™ or a full Qlik Sense Enterprise Client-Managed deployment and do not wish to open firewalls to connect to on premise data. Qlik DataTransfer provides:

- Connection creation and selection dialog to pick source data from standard connectors such as ODBC and REST.

- Ability to create "Datasets" which can run manually or on a schedule to connect to the source data and land this in Qlik Sense Enterprise SaaS and optionally reload an app within the same SaaS space as part of the schedule.

- A "folder watcher" which will also move supported file types (e.g. QVD, CSV) to the data files area within the space of choice and optionally reload an app within the same SaaS space when triggered.

- Capability to reload pre-built Qlik apps on-premise and move these to the SaaS tenant.

Data is uploaded to Qlik Sense enterprise SaaS securely over HTTPS and stored using encryption at rest in the tenants storage attached to each space.

Qlik Data Integration Platform

Qlik's Data Integration Platform is a bundled solution with components such as Qlik Catalog, Qlik Replicate® and Qlik Compose™ for Data Lakes and Data Warehouses, all providing the ability to publish data from a wide breadth of data source end points to cloud storage locations, such as S3 buckets, which can then be used by Qlik Sense Enterprise SaaS to load apps. Data Integration products which can be used with Qlik Sense Enterprise SaaS 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: *https://www.qlik.com/us/products/data-integration-products*

Qlik Sense Enterprise Client-Managed for Windows

Qlik Sense Enterprise on Windows provides the ability to automatically synchronize Qlik Sense apps on-premise with Qlik Sense Enterprise SaaS. It is possible to use rules to tag which apps are distributed to Qlik Sense Enterprise SaaS, so only a subset of apps need to be distributed. This feature allows customers who wish to deploy some apps to Qlik Sense Enterprise SaaS and keep other apps on-premise 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-premise.

Internationalization & Localization

Qlik Sense Enterprise SaaS is a Unicode-enabled product and is compatible with data stored in any language. The user interface and supporting documentation are available in English, German, Spanish, French, Italian, Japanese, Dutch, Brazilian Portuguese, Russian, Swedish, Simplified Chinese, Polish, Turkish, Korean, and Traditional Chinese.

Reliability

Open and transparent

Qlik Sense Enterprise SaaS provides an uptime commitment of 99.9%. Qlik makes data on uptime and incidents publicly available, so customers and prospective customers can see understand the current status and reliability of the Qlik Cloud Services platform on which Qlik Sense Enterprise SaaS runs. This information is available at *https://status.qlikcloud.com/.*

Customers can see the overall uptime of the platform as well as look into specific issues that have occurred to see details on the impact.
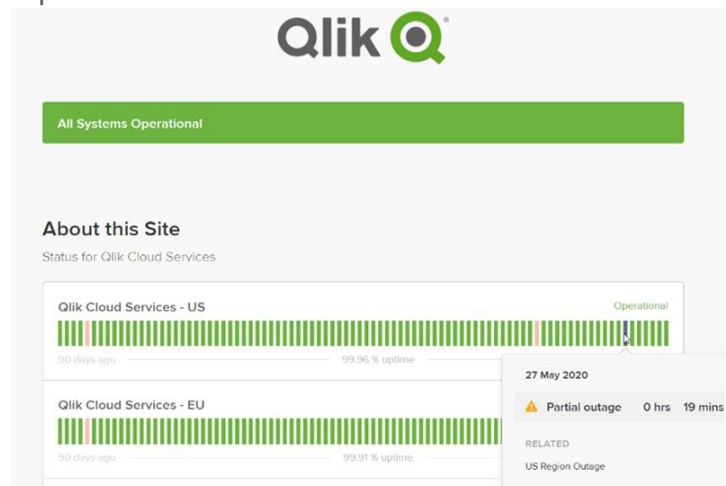
Global presence

Support multiple regions throughout the world

Upon the creation of a Qlik Sense Enterprise SaaS tenant, customers choose the region in which their tenant is based: United States, Ireland or Australia. Customers can therefore select a region to suit their business requirements. Qlik continually reviews feedback from customers and explores making more regions available as demand arises.

Adaptable high availability infrastructure

The Qlik Sense Enterprise SaaS platform runs on a mature, highly available, fault-tolerant infrastructure stack on one of the world's leading cloud infrastructure vendors and is deployed across multiple data centers in multiple regions. Further, the platform is built using a microservice based architecture running on Kubernetes and is designed from the ground up around scalability and fault tolerance. This allows the platform to instantly adapt to any changes and patches and minimizes any potential downtime for the platform.

Disaster recovery / backup and recovery

Qlik's Site Reliability Engineering (SRE) team performs disaster recovery tests regularly. As part of these tests, the team builds an entire new Qlik Cloud Services region. The disaster recovery test is only

deemed successful once the new region is brought up, 100% of the replicated data is recovered and tenants are fully utilizable from the last backup/replication period.

Data and platform information on Qlik Cloud Services related to customer tenant configuration and metadata, is stored in a manner that allows for replication to secondary regions. Customer data files are backed up daily.

Site Reliability Engineering

Qlik's SRE team is responsible for running the Qlik Sense Enterprise SaaS infrastructure. The Qlik Sense Enterprise SaaS platform runs on a major cloud vendor.

Spotlight – The Site Reliability Engineering process at Qlik

Based on Google's Service Reliability Hierarchy, Qlik's SRE team focuses on the following areas:

Monitoring - Our SRE team ensures every service delivered to production can communicate to Qlik how its performing, so that our SRE team is aware of problems as they may arise.

Incident Response – The SRE team prepares the appropriate response plan for the problem. The various options available to the SRE team are documented in service specific playbooks and highlight the best way to deal with a service that is operating in a less than optimal manner.

Postmortems and Root Cause Analysis - When the SRE team is alerted that a service has been degraded in production, the SRE team need to ensure the underlying problem is fixed as quickly as possible. A postmortem is a documented record of an incident, its impact, the actions taken to minimize or resolve it, the root cause, and the follow up actions to prevent the incident from reoccurring. In many cases, one of the outcomes of the postmortem process is to add an additional automated test to the continuous delivery pipeline to ensure that functional issues do not reoccur.

Capacity Planning – The SRE team participates in the ongoing designs of new services and the impacts that new features / modifications may have on existing services. These include:

- o how services scale up to handle increased traffic load
- o how services scale down to seamlessly accommodate reduced capacity
- o what are the optimal size and performance characteristics of infrastructure
- o which services require auto-scaling

Development - The SRE team continually innovates around performance and scalability of the platform. Some examples include:

- o Continual enhancement of measurement and monitoring tools
- o Continual improvements to and expansions of automation capabilities

Measurement – Internal metrics (such as service level indicators and service level objectives) are used by the SRE team to continuously monitor the performance of the environment

Security and Governance Model

Authentication and authorization

Identity and access management

Identity Providers (IDP) have become a standard way to manage authentication and authorization information for organizations. Qlik supports integration with a variety of Identity Providers by supporting the Open ID Connect protocol (OIDC).

> Protocol based - OpenID Connect (OIDC) has become the de facto standard for single sign-on and identity provision on the Internet. OIDC has been designed to work in cloud and provides a solution for both user and machine authentication.

> Control the credentials - When using an Identity Provider with Qlik, Qlik does not know customer logins and passwords. The login process is managed by customer's Identity Provider and the customer decides what information to provide to Qlik Sense Enterprise SaaS. This information could be a short name or code that does not identity the individual. Also, Qlik Sense Enterprise SaaS can utilize Identity Provider groups for controlling access permissions.

> Control access – If a user's access in the customer's Identity Provider is removed or changed, the user will automatically be prevented from accessing Qlik Sense Enterprise SaaS or the corresponding changes are automatically applied.

Through OIDC support, Qlik Sense Enterprise SaaS supports all the major identity providers including Okta, Auth0, Azure AD & ADFS.

Qlik Account

For customers that do not have an Identity Provider available externally or require an in-product solution that does not need to be managed, Qlik provides Qlik Account as a bundled Identity Provider option available as part of Qlik Sense Enterprise SaaS at no extra cost. This allows customers to invite users by email to sign up for a Qlik Account which can then be used to log into Qlik Sense Enterprise SaaS.

While Qlik Account simplifies implementation for some customers, it requires a separate user name and password for Qlik Sense Enterprise SaaS. It is possible for customers to change from Qlik Account to their own Identity Provider if they desire to do so.

Multi-factor authentication

Qlik Sense Enterprise SaaS supports multi-factor authentication for tenant administrators using Qlik Account or from the customer's identity solution. Qlik multi-factor authentication can also be configured for all users using Qlik Account or the customer's IDP.

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, read about Section Access in our help documentation.

Governance

Understanding tenant governance

Qlik provides the **App Analyzer for Qlik SaaS** to provide governance information into customer's Qlik Sense Enterprise SaaS tenant. This app looks at key performance characteristics of apps such as memory usage, cardinality and the data model.
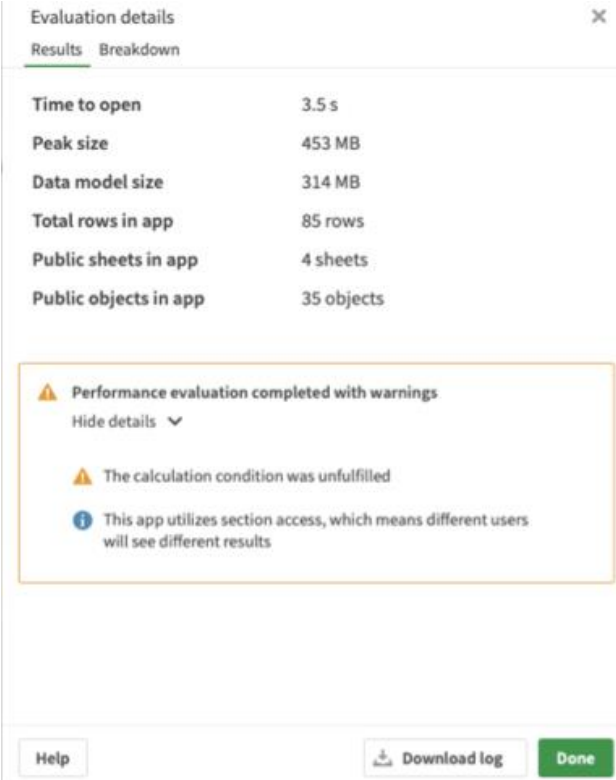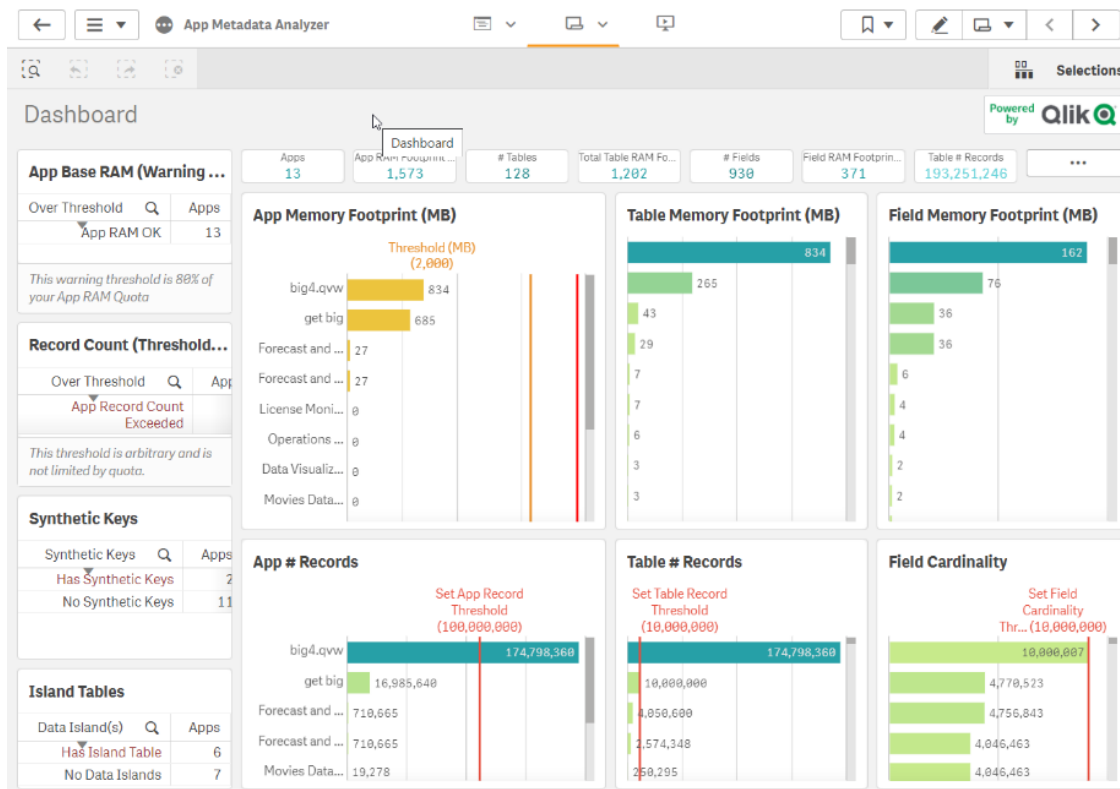
Monitor activity in the tenant

The Qlik Sense Enterprise SaaS Management console contains several tools to assist with the governance of the Qlik Sense Enterprise SaaS tenant. The event viewer shows what user and system-initiated activities have taken place and provides an audit trail for major activities such as user logins, apps created, apps exported, reloading of apps and apps deleted. Within a Qlik Sense Enterprise SaaS tenant, activity is also made available to the customer via APIs. This activity can be downloaded to the customer's security information and event management solution.

Integrate into existing governance solutions

As well as documenting the audit trail though the Qlik Sense Enterprise SaaS Management console, Qlik Sense Enterprise SaaS provides Application Programmable Interfaces that allow viewing (but not modifying or removing) tenant activity. Customers can integrate the Qlik Sense Enterprise SaaS tenant audit trail into an existing governance system or even to build a new audit application within Qlik Sense Enterprise SaaS via the APIs. For more information, read about our Qlik Sense audit service in our help documentation.

Govern and Improve your Qlik Sense Applications with the App Evaluation service

The App Evaluation service helps users manage their Qlik Sense Enterprise SaaS 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.

Evaluation details

Results   Breakdown

Time to open	3.5 s
Peak size	453 MB
Data model size	314 MB
Total rows in app	85 rows
Public sheets in app	4 sheets
Public objects in app	35 objects

⚠ Performance evaluation completed with warnings
Hide details ✓

⚠ The calculation condition was unfulfilled

ⓘ This app utilizes section access, which means different users will see different results

Help   ⤓ Download log   Done

Standards-Based Security & Compliance

Compliance & privacy

When moving workloads to a SaaS platform it is vital to know that data will be secure and that the service provider is following open and audited processes for security controls. Qlik Sense Enterprise SaaS has been built from the ground up as a secure platform and Qlik has worked with external parties to ensure that the applicable industry standard and/or best practice controls are in place.

SOC 2 – Type 2

Qlik is SOC 2 Type 2 compliant. SOC 2 is a rigorous examination by an independent accounting firm based on the AICPA Trust Services Principles and provides an evaluation of the design and operating effectiveness of Qlik's internal controls.

SOC 3

Building on SOC 2, Qlik has successfully completed a SOC 3 Assessment, which is a general use report attesting to Qlik's compliance to the AICPA Trust Services Principles.

ISO 27001

Qlik is ISO 27001 certified, meeting the international standards for implementing an information security management system (ISMS). An ISMS is a framework of policies and procedures that includes the legal, physical and technical controls involved in an organization's information risk management processes.

For the latest information on Qlik's external certifications and compliance, visit our Trust page.

Data sovereignty

Customers' data, including any data within backup/recovery and disaster recovery systems, are maintained within the Qlik Sense Enterprise SaaS Services region(s) the customer signs up for when creating their tenant. Nothing is transferred out of region. Copies of backups are stored with a secondary provider within the same region.

Data privacy and GDPR

Qlik has built comprehensive internal processes to ensure Qlik's compliance with applicable privacy (including GDPR) requirements. Qlik is committed to protecting the data of Qlik customers and

partners, and communicating in an open and transparent manner. For more information visit our [GDPR page](#).

Data separation, storage & transport

Qlik Sense Enterprise SaaS is a multi-tenant platform. As a multi-tenant platform, it is crucial that each customer's data is separated from other customers. Each tenant has a uniquely generated set of encryption keys that Qlik manages for that customer. Each tenant's keys are separate from keys Qlik uses to secure service to service communication. The following encryption is used within the Qlik Sense Enterprise SaaS platform:

- In transit - TLS 1.2 encryption

- At rest - AES-256 encryption

- Within the platform – (upon authentication with the customer's designated IDP) uses signed JSON Web Tokens (JWTs) to ensure integrity, authenticity & non-repudiation

User access to the tenant is granted by the customer through the Identity Provider and permissions are controlled via the customer's administration portal.

Content Deletion

"Content" is the customer-provided data and other information within the Qlik Sense Enterprise SaaS tenant.   The creation and removal of content that resides in the tenant is controlled by the customer. Content can be deleted by the customer at any time. Backups are removed after a period of time in accordance with Qlik's internal data retention policies.

Customer-provided data is stored as encrypted QVD or QVF files in the underlying Kubernetes storage solution used by Qlik Cloud Services. When a customer deletes an App in Qlik Cloud Services, the service deletes the file on the underlying Kubernetes storage solution. QCS relies on the Kubernetes storage solution file system to execute the delete in the underlying block storage.

Qlik leverages both Amazon AWS and Google for backups to maintain copies of Content for 30 days before that Content ages out and is deleted from the supporting file systems. QCS leverages Google Cloud Platform backups with Remote Sync and Amazon Simple Storage Service (S3) to copy Content for backup purposes.

Qlik Sense Enterprise SaaS platform security

Monitored for security 24/7

Qlik Cloud Services is monitored by Qlik's SRE team. All security logs are centrally processed by the SRE team, and all incidents are handled in accordance with Qlik's incident response program.

Security best practices

In order to ensure a strong, secure foundation, Qlik shares security responsibilities with an industry leading cloud infrastructure vendor and valued partner. These cloud computing services are used by Qlik for internal purposes as well as Qlik's clients for their own cloud deployments. See the section on Compliance & Privacy for more information.

Qlik Cloud Services relies on cloud infrastructure for secure physical access, redundant (fault tolerant) infrastructure, and scalability. Our cloud partner's network design and monitoring mitigate common types of network security issues such as Distributed Denial of Service (DDoS), Man in the Middle (MITM), IP Spoofing, Port Scanning, or packet sniffing.

Qlik's approach to security builds on our cloud partner's layers of security. Qlik has network and endpoint monitoring controls in place, including intrusion detection and process monitoring. At the Web layer, Qlik utilizes a web application firewall to detect and prevent attacks. Access to QCS leverages multi-factor authentication and role-based access control.

Qlik performs regular vulnerability testing both at the network and endpoint level. Vulnerability remediation is incorporated into the continuous deployment methodology in Qlik Cloud Services.

Approach to vulnerability management

Qlik's software development process incorporates a Secure By Design approach to software delivery. A significant contributor to that process is our approach to vulnerability management. Qlik maintains a modern vulnerability management remediation policy that includes:

- Leveraging vulnerability severity ratings based on industry standard Common Vulnerability Scoring System (CVSS) to judge the severity of security issues. (Scale of 1-10 with 10 being most severe)

- A policy related to vulnerabilities identified during development and the release of software with known vulnerabilities including remediation windows

- A policy related to vulnerabilities identified in Qlik Sense Enterprise SaaS updates including remediation windows

- Customer notification policies for vulnerabilities

- Third party software security and remediation policy

- Tooling and processes covering Threat Modeling, Dynamic and Static Code Scanning, Penetration Testing, and Third Party Software components.

Secure By Design – How Qlik Builds a Secure Platform

Qlik incorporates security during the software development life cycle by adhering to the Qlik Security Model, which has been developed by the Qlik Software Security Office. The Qlik Security Model is an internal process that ensures that all software development is done with a security focus. The model is a result of sourcing best practices from several existing well renowned secure software development processes and adapting them to fit the needs of Qlik. The model has five phases that span the entire lifecycle of software development:

Analysis & Design: This phase of the processes includes system and feature level threat modeling. When a product is designed, the team considers each feature and determines the possible threats for this feature. Countermeasures are put in place to mitigate each threat.

Develop: Qlik uses industry-leading static code analysis tools to identify issues on both the code specific to new features and the end-to-end code. After deployment, the static code analysis tool runs the report on a regular basis. The automated reports are supplemented with manual security testing processes. If manual verification confirms a security issue exists, then it is addressed prior to deployment.

Assemble: Test cases are created from a security perspective and executed during the development process. Testing includes system level, feature level, penetration level and fuzzing. Test cases consider the end-to-end new product release to identify any security issues within the new product. Specific tests are conducted on code that contains the new features within the product. An independent third-party security company regularly audits the products through penetration testing.

Deploy: The Software Security Office is involved in the deployment phase through its vulnerability management process. Working with external security companies, customers, and partners to identify vulnerabilities within the deployed code, the team will assess any reported vulnerability and determine appropriate action.

Evolve: All results from the activities that are a part of the security model are reviewed by the Software Security Office. The goal is to identify areas of improvements, and adjustments are made to the model accordingly

Architecture

Qlik's cloud native platform and Kubernetes stack

In order to design a highly-scalable, highly-available cloud platform and service, Qlik could not simply shift our Windows products and move them to the cloud. Qlik Cloud Services and Qlik Sense Enterprise SaaS are based on a micro-services architecture, and the various components of the platform have been built from the ground up to build a cloud native solution. Qlik's container-based micro-services architecture allows each component to scale as needed rather than adding more servers as traditionally done on on-premise solutions.

A key feature of this platform is the ability to horizontally scale up as workloads increase and scale back down as they reduce, which is used in Qlik Sense Enterprise SaaS to ensure consistent performance for our customers regardless of the number of users on the platform. Automated monitoring and adjustment of resources allows all components of the platform to have the right resources at the right time.

Another key aspect of Cloud Native apps is the concept of zero-downtime deployment. Qlik Sense Enterprise SaaS has been designed to support zero-downtime deployment. Qlik is able to upgrade key components of the platform without outages.

Qlik utilizes Docker and Kubernetes to manage the scaling dependencies of the platform. A reference diagram for our Kubernetes deployment is shown below.
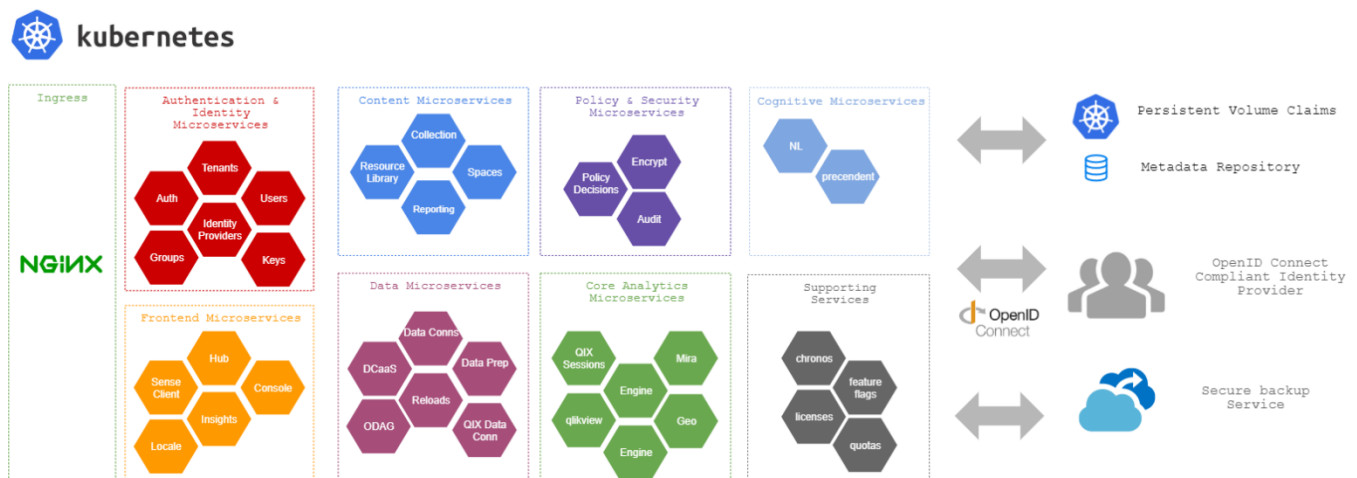
Some of the key technologies used in Qlik Sense Enterprise SaaS are:

Kubernetes – Kubernetes provides automated container deployment, scaling, and management. For more information see *https://kubernetes.io/*

Docker – Docker provides containers where Qlik micro-services run. Containers are a standardized unit of software that allows developers to isolate their code from its environment, solving the "it works on my machine" headache. See *https://www.docker.com/why-docker*

NGINX Ingress Controller – NGINX Ingress Controller provides the web interface and internal load balancing for Qlik Sense Enterprise SaaS tenants. NGINX is an HTTP and reverse proxy server, a load balancing server, and a generic TCP/UDP proxy server. See *https://www.nginx.com/products/nginx/kubernetes-ingress-controller/*

MongoDB - MongoDB is a cross-platform document-oriented database. It is used as the metadata repository within Qlik Sense Enterprise SaaS *https://www.mongodb.com/*

Predictable performance at scale

To ensure the best possible end user experience, Qlik continuously takes anonymized samples of the performance and scalability of individual tenants. Several different configurations are tested to make sure that the tenants can cope with the expected use cases and loads. Some of the parameters tested include:

- ○ User ramp-up (that is, the number of users accessing the tenant per time unit)

- ○ User type - e.g. consumer or creator

- ○ Number of concurrent users

- ○ Number and size of apps

- ○ Number, frequency and size of concurrent reloads

Response time over time per Label
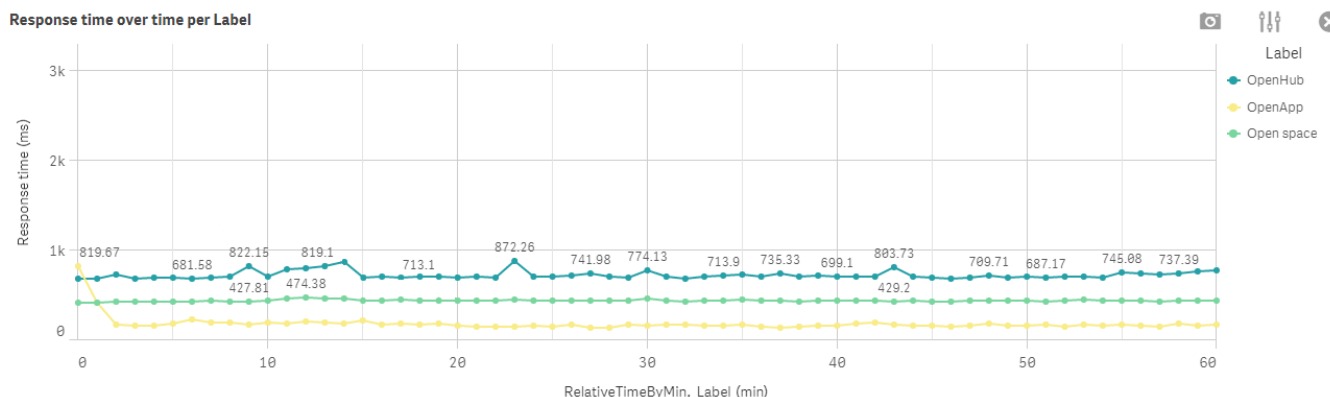
In this example, we tested 10,000 users per hour accessing 100 (out of 1600 available) different apps with an average data volume of 1.6 million rows. As shown above, response times for opening the Qlik Sense Hub, opening spaces and opening individual apps were all under a second for all users.

Flexible & extensible

Qlik Sense Enterprise SaaS is designed to be flexible and extensible to customer needs. There are several deployment patterns available to customers looking to leverage a hybrid deployment. These capabilities are achieved through the Qlik Sense Hub and allow customers to deal with legislative requirements to keep certain data on-premise.

For example, customers with predominantly on-premise data sources can choose to perform their QlikView and Qlik Sense data loading operations on-premise and move all of their users' data visualization to Qlik Sense Enterprise SaaS.

Another use case involves moving most activities to the cloud but using an on-premise deployment to run batch reporting activities and integrate with Advanced analytics solutions such as R, Python and other third-party products.

Qlik can provide advice and assistance on the SaaS deployment applicable to a customer's business requirements.

Integrating and Expanding Qlik Sense Enterprise SaaS

Integration approaches

Qlik Sense Enterprise SaaS supports a number of options for integrating Qlik hosted apps into customer's own environment. For detailed information on the options available see *https://qlik.dev/basics/authentication-options*

API keys

An API key is a token representing a user in the Qlik Sense Enterprise tenant. Anyone may interact with the platform programmatically using the API key. The token contains the user context, respecting the access control privileges the user has in the tenant. API keys use cases include qlik-cli (command line interface), making requests through scripts, or a machine-to-machine backend solution.

Interactive Login

To authenticate users in web apps, use multiple REST endpoints to evaluate if the browser has an active Qlik Sense SaaS session. Then use a redirect to the tenant's sign-in URL.
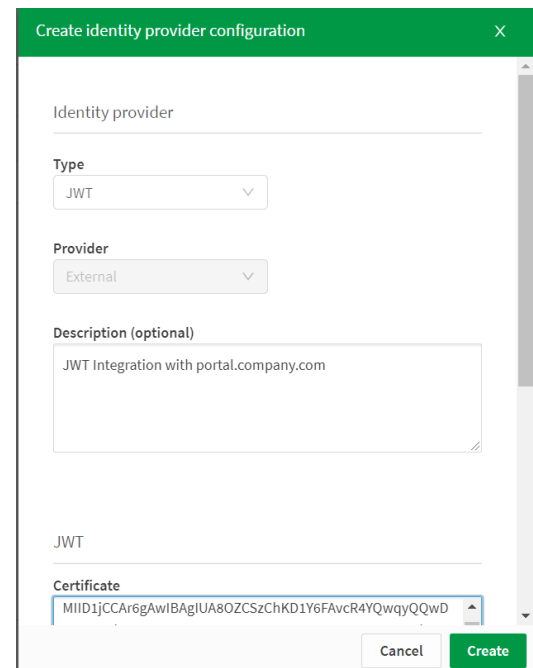
Web apps embedding Qlik Sense objects or data, also known as mashups, require a web integration id in the tenant's configuration. Web integration ids are a security feature of Qlik Sense Enterprise SaaS for handling Cross-Origin Resource Sharing (CORS) of embedded Qlik Sense Enterprise SaaS content.

In addition, web apps with Content embedded in them require a cross-site request forgery (CSRF) token supplied in the URI referencing Qlik Sense Enterprise SaaS APIs and the Qlik Associative Engine.

JSON Web Tokens (JWT)

JSON Web Tokens, digitally signed, are commonly referred to as a "JWT." A JWT is a standard for transmitting information between software applications in the form of a JSON object, verified and trusted using a public / private key pair. JWTs have two primary use cases, authorization and information exchange. Qlik Sense Enterprise SaaS reads JWTs from external identity providers during the authentication phase. Qlik Sense Enterprise SaaS creates an internal JWT post authentication for use during a session.

The external JWT authorization option in Qlik Sense Enterprise SaaS enables client applications to directly send a custom JWT, bypassing the interactive sign-in to the Qlik tenant. The user is the authorized to access Qlik Sense Enterprise SaaS. The JWT capability enables customers to provide seamless integrations between their applications and Qlik Sense Enterprise SaaS.

Applications connecting to Qlik Sense Enterprise SaaS with JWTs require the same web integration id and cross-site request forgery prevention as all integrations. with the platform.

Embedding

Qlik Sense Enterprise SaaS 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 on our help site. 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:
https://github.com/qlik-oss/web-integration-examples
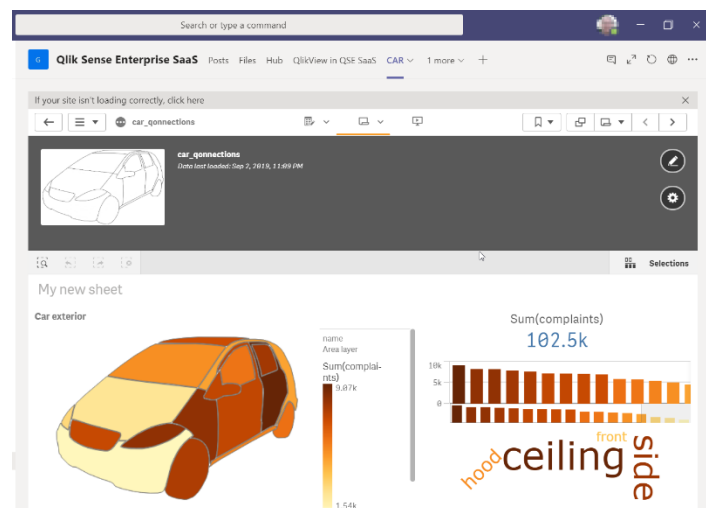
API governance policy

Qlik's API strategy follows an API governance policy to communicate additions, changes, and deprecations to Qlik's API portfolio. Qlik R&D follows API guidelines for marking API stability, standardizing references on specifications (e.g. OpenAPI for ReST APIs), and handling API deprecations.

The main objective of the API strategy is to provide open and transparent guidance to customers and partners who rely upon Qlik APIs to extend the platform.

Qlik R&D has developed a patent-pending API governance framework that collects information from commits made by the development teams to help make APIs discoverable and maintainable. This helps the team deliver enhancements to the platform continuously, and ensures API consumers outside the organization are accessing components of the highest caliber. For more information regarding Qlik's API governance policy please visit https://qlik.dev/basics/api-governance.

Qlik Open Source

In addition to API governance, Qlik R&D delivers libraries to accelerate development, testing, and integrating of the Qlik Sense Enterprise SaaS platform through Qlik Open Source (https://github.com/qlik-oss) . 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 & Enigma.go** - JavaScript & golang libraries for consuming the Qlik Associative Engine

- **Gopherciser** - a load testing tool for Qlik Sense Enterprise SaaS

For more information on Qlik Open Source see *https://github.com/qlik-oss/open-source*.

Tools and resources

Developer Portal (https://qlik.dev/) - is a central location for developers to find the information they need to develop with Qlik products including Qlik Sense Enterprise SaaS, including developer documentation, API references, tutorials, etc.

Qlik-cli - is a command line interface for automating management activities in Qlik Sense Enterprise SaaS. This is available at *https://qlik.dev/libraries-and-tools/qlik-cli*

Upgrading from Qlik Sense Business to Qlik Sense Enterprise SaaS

If a Qlik Sense Business customer wishes to upgrade to Qlik Sense Enterprise SaaS and gain additional features and data capacity, they can upgrade their subscription. Qlik allows customers to upgrade a Qlik Sense Business trial or Qlik Sense Business subscription to a Qlik Sense Enterprise SaaS subscription without creating a new tenant so that information and data are maintained.
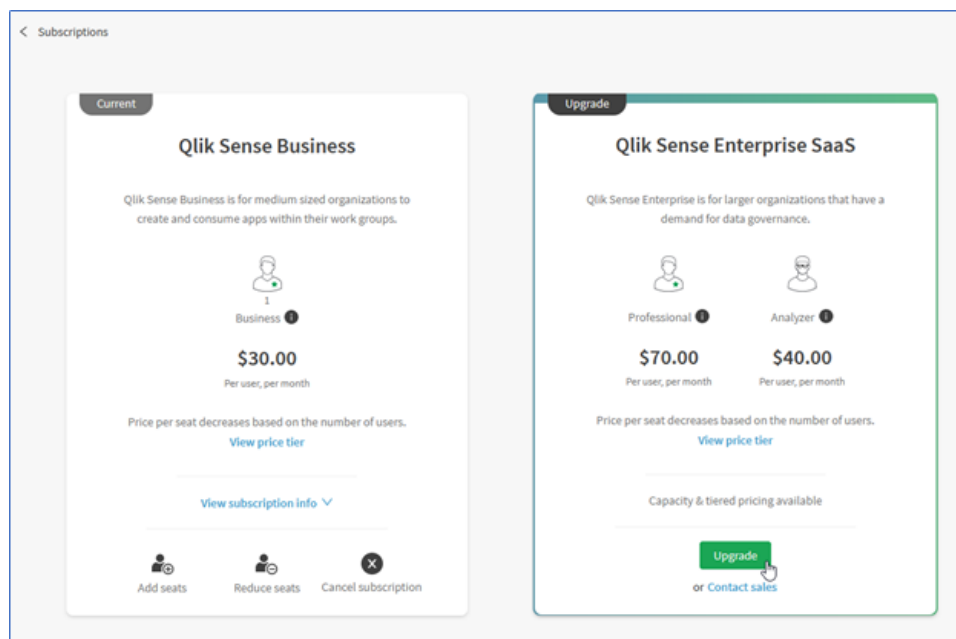
Summary

Qlik Sense Enterprise SaaS is designed to provide our customers with a platform to securely move their analytic workloads to the cloud. Built on Cloud Native technologies, Qlik Sense Enterprise SaaS has been designed to automatically scale to meet the workloads of the modern enterprise and provides Qlik customers a platform that can consolidate Qlik Sense, QlikView and other BI apps in a single hub.

With a global presence and a strong focus on security and availability, Qlik Sense Enterprise SaaS 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.

Qlik understands that our customers often want to integrate and embed their analytics and visualizations into their own portals and systems. Therefore, Qlik has and continues to invest in providing integration approaches and supported open sources 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 assisting our customers make Qlik Sense Enterprise SaaS a part of their own solutions.

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

Qlik Q LEAD WITH DATA

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. Qlik provides an end-to-end, real-time data integration and analytics cloud platform 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 50,000 customers around the world.

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