Qlik Analytics Platform

Embedding and extending custom visual analytics

LEAD WITH DATA™ Qlik Q

Qlik® has a simple philosophy:
Visual analytics should allow you to
discover every possible connection
within your data. And our vision
of analytics for everyone goes
beyond just self-service to deliver
technology, resources, and support
for developers building visual analytic
solutions for consumers. We don't
limit the possibilities for what the
greater visualization and app-building
community can imagine.

Qlik Analytics Platform®

Qlik Analytics Platform puts the power of the Qlik
Associative Engine and visualizations in the hands of
application developers. Through open and modern APIs,
you can easily and flexibly embed Qlik powerful visual
analytics capabilities right into your own applications.

Supporting Developers

The Qlik Analytics Platform is
designed to allow application
and web developers to easily
and flexibly embed powerful Qlik
visual analytics capabilities right
into their own applications. These
can be as simple as web mashups
containing just a few charts or
much more complex integrated
web or device applications.

Delivering for ISVs

The Qlik Analytics Platform
enables ISVs to take full
advantage of the Qlik Associative
Engine, compelling visualizations,
and APIs to easily build visual
analytics right into their
solutions, providing maximum
value to their customers.

A Platform for Enterprises

The Qlik Analytics Platform
gives enterprises a single visual
analytics platform to extend
the use of Qlik across and
beyond their organizations. It's
optimized to incorporate open-
source technologies like D3 to
create custom visualizations and
extensions, but in a smart and
governed way.

Integration Capabilities

Qlik Analytics Platform provides many integration capabilities that enable development in a wide range of environments.

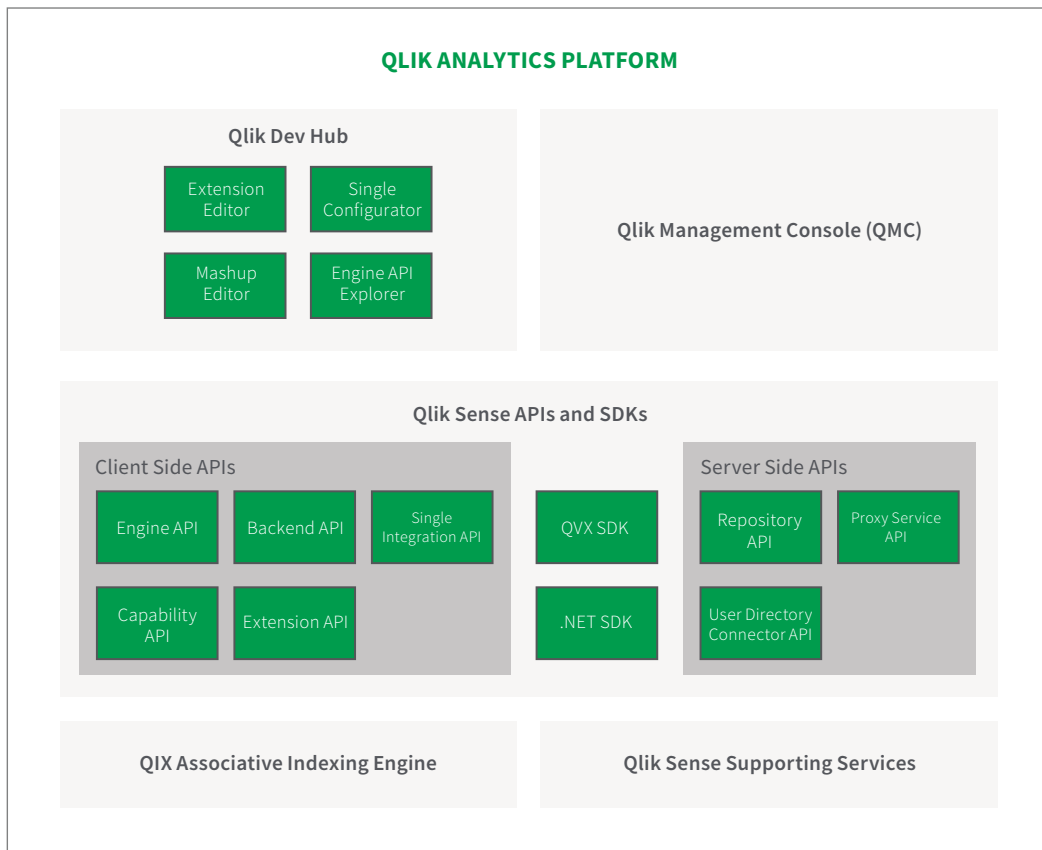| CAPABILITIES	DESCRIPTION
Connecting to custom data sources	The Qlik Sense® platform allows you to integrate custom data sources by using the Qlik data eXchange (QVX) SDK. It encases the logic in a custom connector to provide a seamless user experience.
Extending Qlik Sense with custom visualizations	Qlik Sense visualization extensions enable new ways of visualizing data and enhance user input and interaction. The visualization extensions are regular Qlik Sense objects that you have added your own rendering code to. They can be charts of different types, or other items like tables or filter panes. In QlikView®, these types of extensions are referred to as Object Extensions. Visualization extensions can be integrated with other systems and visual libraries, new selection objects and productivity components can be added, and it can all be done using open standards such as HTML5, JavaScript® and CSS.
Embedding Qlik Sense in web applications	Qlik Sense apps, sheets and visualizations can be embedded in (for example): • Portals • Web applications • Intranet and extranet sites There are two ways of embedding the Qlik Sense content: • iFrame integration using the Single Integration API • Div integration using the Capability APIs
Expanding Qlik Sense	You can integrate Qlik Sense in your own software using the Qlik Sense APIs and SDKs. It can, for example, be integrated as a: • Windows application • Web-based application You can also leverage the Qlik engine in your applications, as well as automate common tasks and build your own client.

Architecture

This section describes the architecture of Qlik Analytics Platform.

Overview

The Qlik Analytics Platform gives you full API access to the Qlik engine to build rich and smart embedded analytics applications. You can take advantage of the platform to build web applications for deployments such as extranet and/or the Internet.

The Qlik Analytics Platform consists of:

• Qlik Dev Hub

• Qlik Management Console (QMC)

• Qlik Sense APIs and SDKs

• Qlik Associative Engine

• Qlik Sense supporting services

QLIK ANALYTICS PLATFORM

Qlik Dev Hub

| Extension Editor | Single Configurator |
| Mashup Editor | Engine API Explorer |

Qlik Management Console (QMC)

Qlik Sense APIs and SDKs

Client Side APIs

| Engine API | Backend API | Single Integration API |
| Capability API | Extension API | |

QVX SDK

.NET SDK

Server Side APIs

| Repository API | Proxy Service API |
| User Directory Connector API | |

QIX Associative Indexing Engine

Qlik Sense Supporting Services

Qlik Analytics Platform architecture diagram

Standard, Modern, and Open Technologies

Qlik Sense relies on the following technologies:

- Qlik Dev Hub
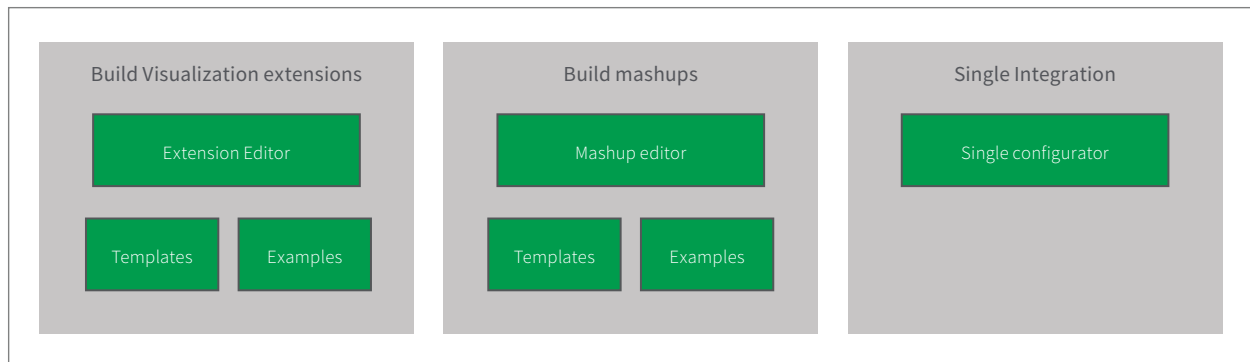- HTML5
- WebSocket
  - CSS3
  - JSON
  - Canvas
  - REST

Qlik Sense uses the following libraries:

- AngularJS
- RequireJS

Qlik Dev Hub

Qlik Dev Hub is a developer workbench for building custom apps, embedded analytics, and extensions that allows easier access to the capabilities in the Qlik Analytics Platform. Qlik Dev Hub comes with a number of visualization and mashup templates and can be used for getting started building custom visualizations and mashups.

QLIK DEV HUB TOOLS

TOOLS	DESCRIPTION
Mashup Editor	The Mashup editor assists in creating mashups that display Qlik Sense data on your website.
Extension Editor	The Extension editor helps developers getting started developing visualization extensions. It supports JavaScript®, QEXT, CSS and HTML.
Single Configurator	The Single configurator provides an easy way of creating simple mashups without having to write any code. It returns a Qlik Sense object, which is identified in a URL. The Qlik Sense object is typically a visualization from an app like a line chart.
Engine API Explorer	The Qlik Engine API Explorer is a tool that helps you understand the Engine API. It passes information between the Qlik Associative Engine and the client.

Qlik Management Console (QMC)

The Qlik Management Console (QMC) is a web-based application for configuring and administrating your Qlik Sense site. The QMC always connects to the central Qlik Sense node where all system data is stored and with which all local nodes synchronize. Even if you have a multi-node, geographically distributed Qlik Sense installation, the QMC enables you to perform the following from one location:

- Manage licenses
- Manage tokens and access types
- Configure nodes
- Manage data connections

- Manage content security (by security rules)
- Manage tasks and triggers
- Synchronize content

Qlik Sense APIs and SDKs

Qlik Analytics Platform provides a range of APIs and SDKs that are built on open and standard web technologies. They include:

APIs AND SDKs	DESCRIPTION
Client-side APIs	Use the client-side APIs to build visualization extensions and mashups. Use them when embedding Qlik Sense in web applications and when extending Qlik Sense with custom visualization extensions. • Qlik Engine API • Backend API • Extension API • Capability APIs • Single Integration API
Server-side APIs	Use the server-side REST APIs to manage data and configuration information for your site. You can also use them to manage site authentication, session handling, and load balancing. They also provide functionality for importing users and groups from external sources. • Qlik Sense Proxy Service API • Qlik Sense Repository Service API • Qlik Sense User Directory Connector API
QVX SDK	Use the Qlik QVX SDK to build customized connectors to retrieve data from data sources not supported by a generic Qlik Sense installation.
.NET SDK reference	Use the Qlik Engine API Explorer to send messages to and get answers from the Qlik Associative Engine.

Qlik Associative Engine

Qlik Analytics Platform provides direct access to the Qlik Associative Engine. The engine is the second generation of the proven and patented engine technology that has powered Qlik products for the last decade. It provides associative data indexing and dynamic calculations that empower people to naturally explore data, allowing them to see all the connections in all their data. Associative data indexing exposes relationships in complex, multi-source data sets that would be hidden in hierarchical or query-based approaches.

Qlik Sense Supporting Services

The Qlik Sense services, which run on the Microsoft Windows operating system, can be deployed in different ways on a node to suit different deployment purposes. They include:

SERVICE	DESCRIPTION
Qlik Sense Repository Service (QRS)	Manages persistence and synchronization of apps and licensing, security, and service configuration data. The QRS is needed by all other Qlik Sense services to run and serve apps. It attaches to a repository database and manages the repository database synchronization in multi-node sites. In addition, the QRS stores the app structures and the paths to the binary files.
Qlik Sense Proxy Service (QPS)	Manages site authentication, session handling, and load balancing.
Qlik Sense Scheduler Service (QSS)	Manages the scheduled reloads of apps as well as other types of reload triggering based on task events.
Qlik Sense Engine Service (QES)	Handles all application calculations and logic.
Qlik Sense Printing Service (QPR)	Manages export in Qlik Sense.
Qlik Sense Service Dispatcher (QSD)	QSD is a service controller that's used to launch and manage the other Qlik Sense services: • Chart Sharing Service: Used to share charts between Qlik Sense users. • Data Profiling Service: Used to access and modify the application load model. • Migration Service: Ensures that your apps can be used in the currently installed version of Qlik Sense.

Deployment

Here are the requirements and assumptions for deploying Qlik Analytics Platform.

Qlik Analytics Platform Licensing

The Qlik Analytics Platform is licensed on capacity (CPU cores) in the deployment, and there is no cap on the number of users.

Distribution of Engine Cores

By default, the engine cores are evenly distributed on the nodes within the site. If the number of cores available via the license is uneven in relation to the number of nodes in the site, the extra cores are distributed to the Central node.

- **Example: Eight cores distributed on three nodes** The default distribution of eight cores on three nodes is two cores on Rim node A, two cores on Rim node B, and four cores on the Central node.

- **Example: Four cores distributed on two nodes** The default distribution of four cores on two nodes is two cores on the Central node and two cores on the Rim node.
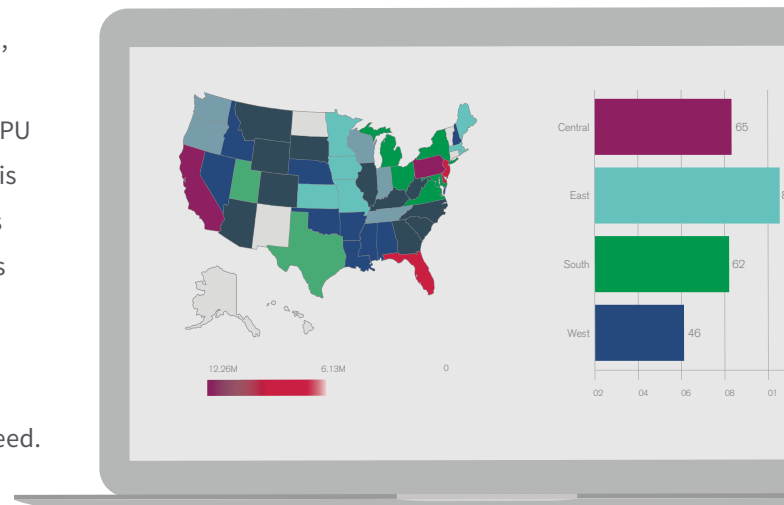
Please reference Qlik Analytics Platform License Metrics for more information.

Performance Benchmark

Applications vary in size and complexity. Qlik uses a testing methodology called the Qlik Capacity Benchmark to provide a comprehensive set of data with which customers can judge scalability and plan for deployments.

This series of tests is conducted by varying data volumes, users, and applications in a given environment and recording the results. This exhaustive set of permutations yields a matrix of CPU utilization, RAM utilization, and response times. This approach is different than many other scalability tests. Not only are metrics reported when a server is saturated, but also when the server is only partially utilized.

Please consult with your local sales representative or Qlik implementation partner to determine the sizing that you will need.
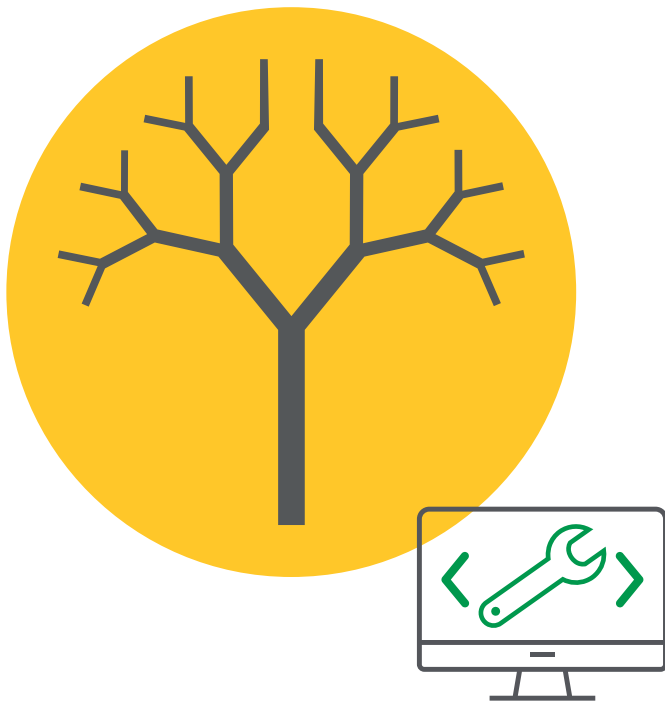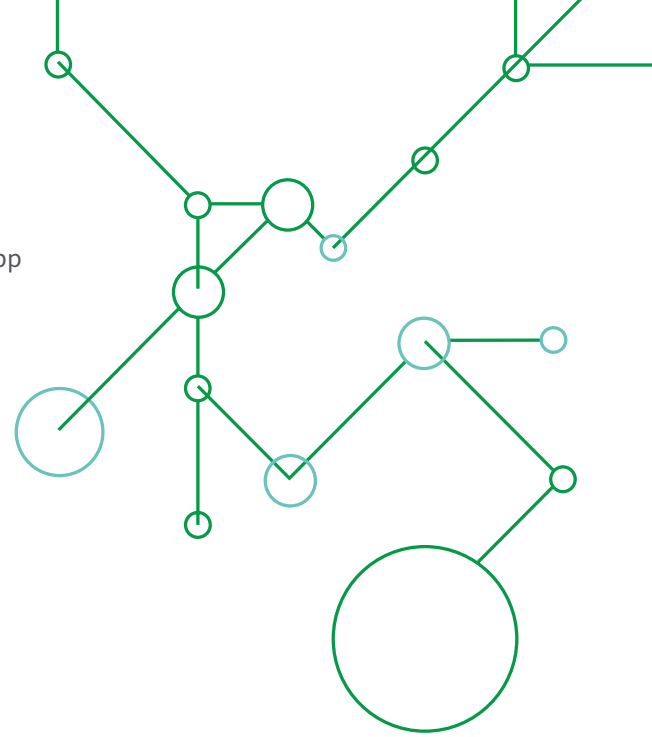
Development Skill Sets

For building visualization extensions and mashups with Qlik Analytics Platform, developers should have at least some experience in Qlik Sense app development along with greater experience in web development.

The following assumptions apply:

- The user has good knowledge of JavaScript.
- The user has good knowledge of HTML.
- The user has good knowledge of CSS.
- The user has some knowledge, not a must, of RequireJS.

Development Cycle

The initial route of the development cycle starts with creating a Qlik Sense application using Qlik Sense Enterprise with a test site license (recommended) or Qlik Sense desktop -- and then making use of Qlik Dev Hub, a development toolbox which include tools like the Mashup editor to quickly build up an app using templates. You can use this automatically created code, bring it into your IDE of choice, and continue developing. To deploy, migrate the Qlik Sense application using App Import in QMC to Qlik Analytics Platform and the web app to the application web server.

Open Platform for Developers

Qlik Branch® is a game-changing platform that accelerates innovation for developers, helping them bring the best ideas to market. Rooted in open-source philosophy, it allows all projects to be freely distributed and modified, allowing faster collaboration and iteration.

For developers, Qlik Branch is a place to innovate and take advantage of the capabilities and extensibility of the APIs and Qlik platform. Sharing their projects on Qlik Branch makes their projects more accessible for use and collaboration.

Non-developers can use Qlik Branch as a great resource for finding custom solutions for their applications. And if a custom solution hasn't been built yet, they can find a developer to do it.

Visit Qlik Branch at developer.qlik.com

Summary

The Qlik Analytics Platform has been designed to accommodate the need for embedded analytics, anywhere. By directly accessing the same market-leading associative in-memory engine (the Qlik Associative Engine) that is used by all Qlik analytics products, developers can gain the same benefits as end users, but with much greater flexibility. This is accomplished through a series of modern, open, and standard APIs such as the Mashup API, Extensions API, Engine API and backend management APIs.

The Qlik Analytics Platform also offers a single governance framework to allow for common security, manageability, and reusability. Our approach covers a wide spectrum of analytics use cases, giving you the ability to extend the Qlik experience into any application, with any types of visualizations, all done within the same platform.

Additional Resources :

- For more information about Qlik Sense architecture, see the white paper *Qlik Sense® Architecture Overview.*

- For more information about Qlik Sense security, see the white paper *Qlik Sense® Security Overview.*

- To learn more about the Qlik Associative Model, read the white paper *Qlik's Associative Model.*

- The Qlik Sense developers' help site is help.qlik.com.

Qlik Q®

About Qlik

Qlik's vision is a data-literate world, one where everyone can use data to improve decision-making and solve their most challenging problems. Only Qlik offers end-to-end, real-time data integration and analytics solutions that help organizations access and transform all their data into value. Qlik helps companies lead with data to see more deeply into customer behavior, reinvent business processes, discover new revenue streams, and balance risk and reward. Qlik does business in more than 100 countries and serves over 50,000 customers around the world.
qlik.com