Progress®

Deliver Secure SQL Access for Enterprise APIs

For enterprise architects and ISVs

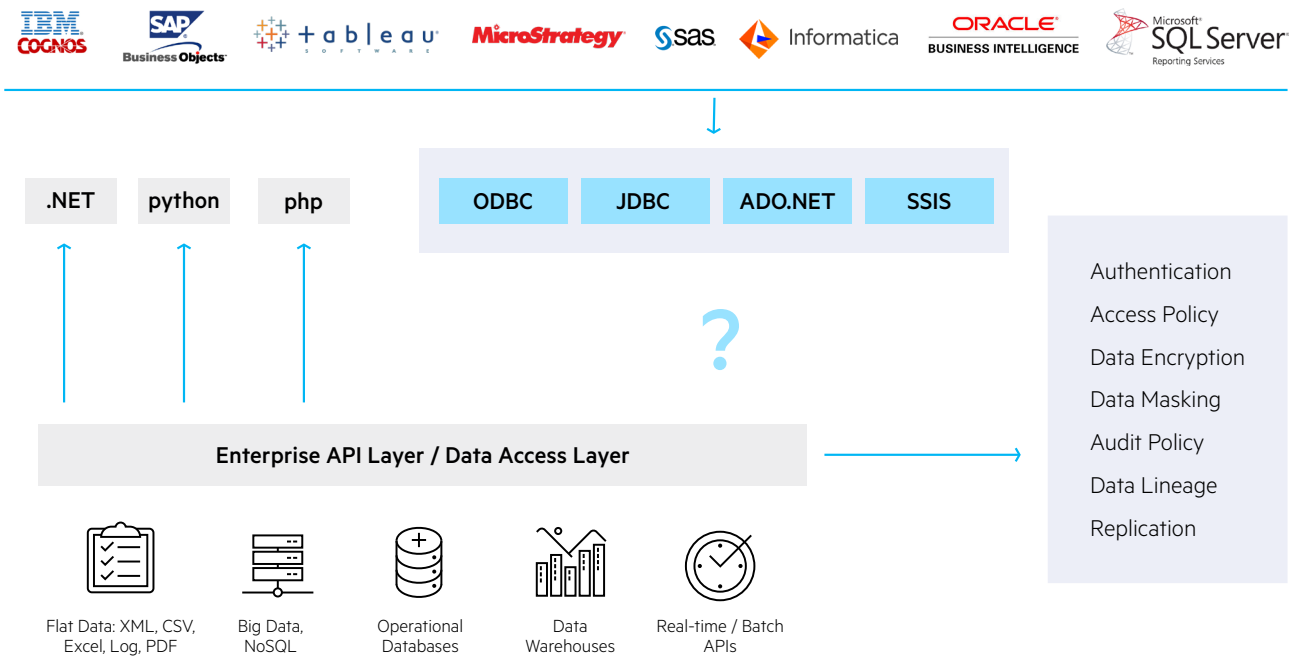
WHITEPAPER

BI Tools Cannot Easily Access Enterprise APIs

Enterprises are investing heavily in API layers to control authentication and data access from one place and perform the heavy lifting of security, encryption, auditing and governance in the face of changing regulations. These APIs are often engineered for application developers and based on protocols such as REST or SOAP with payloads in XML or JSON. The API layer can then be accessed by developers using various clients such as Java, .NET, Python or PHP.

As enterprises transform with the API economy, standard SQL access remains critical for enterprise analytics groups to deliver core business operations such as earnings reports, credit risk analysis, pricing strategies, fraud protection, among other uses cases.

However, enterprise APIs require custom coding to be consumed from BI tools. Out-of-the-box, standard SQL connectivity from these tools no longer works. Even with direct database access that bypasses the centralized security and management, it's not practical for data developers to recreate in BI tools the complex transformations happening in the business logic of the API layer.



Enterprise data teams now have to go to IT to access the data, which is neither scalable nor self service. As enterprises adopt modern analytical and data management tools, a SQL access layer for this data becomes imperative. The long-term success of companies is dependent on their ability to integrate enterprise data into core business analytics tools.

This whitepaper shows you how to quickly integrate your internal API layer into various tools such as Microsoft Excel, SAP BusinessObjects, IBM Cognos, Oracle Business Intelligence (OBIEE), SAS, SSRS, SSIS, Tableau, MicroStrategy, Informatica and others, while taking advantage of centralized API infrastructure capabilities.

How Have BI Solutions Evolved?

Image Source: Gartner Presentation, "Is One Business Intelligence Tool Enough?", Gartner Catalyst Conference, 2017
Soyeb Barot, August 2017

According to Gartner, "The BI and analytics platform market has undergone a fundamental shift away from more IT-centric solutions to business-user-driven solutions."*

Business intelligence has evolved from IT-led reporting to business-led, self-service solutions. This innovation came about in part because tools could easily connect to various data sources. And standardization makes that possible. SQL is still the standard language that enables BI, reporting, and analytics tools to query different types of data, whether big data, NoSQL, operational databases or data warehouses.

These tools can offer access to so many data sources because of standards such as ODBC, JDBC and REST. Today, use of these standards is still popular and growing, as shown in the graph below.

* Gartner, Critical Capabilities for Business Intelligence and Analytics Platforms, March 2, 2017

Source: 2017 Data Connectivity Outlook Survey

With widespread adoption of an API/data access layer, business users are finding themselves back to the model in which IT must be involved to access data. It's now a struggle to maintain agile and self-service BI.

A Connector SDK Can Get You Back to Self-Service BI

Enterprise IT needs a fast way to SQL-enable their internal API layer for business intelligence. They need a solution that can easily plug into this API layer with standard SQL clients—ODBC, JDBC, ADO.NET and OLE-DB. These SQL clients allow your data access layer to expose the desired data/APIs to the BI tools your data team wants to use, such as OBIEE, SAP Business Objects, Cognos, Microstrategy, SAS, Tableau and Informatica.

An enterprise-class connector SDK provides the quickest way to build custom SQL clients to access the data access layer for analytics, without requiring expertise in data access specifications. The best connector SDK enables you to support multiple APIs and tools, while taking advantage of the capabilities of the enterprise API layer.

What to Look for in Delivering SQL Clients

- **Support for multiple APIs from a single interface**: Some BI/analytics tools are written in Java and support JDBC, many others are native and use ODBC, and some custom enterprise applications may use ADO.NET or OLE DB. The solution should support all these standards via a single interface for lower cost of ownership.

- **Compatibility with enterprise BI and data integration tools**: The solution should match the functionality and support offered by popular tools and the solution vendor should have strong relationships with BI and database vendors to handle any incompatibilities that may arise.

- **Interface code should support multiple APIs**: You should be able to use the same code to support multiple data APIs—ODBC, JDBC or ADO.NET. And expertise in these data access specifications or SQL engines shouldn't be required.

- **Authentication**: The solution should integrate with your authentication code or identity management API, security systems and should support OAuth flows for the most secure SQL access.

- **Data modeling**: The solution should be able to model whatever data access service layer and underlying database you're exposing as SQL tables and columns.

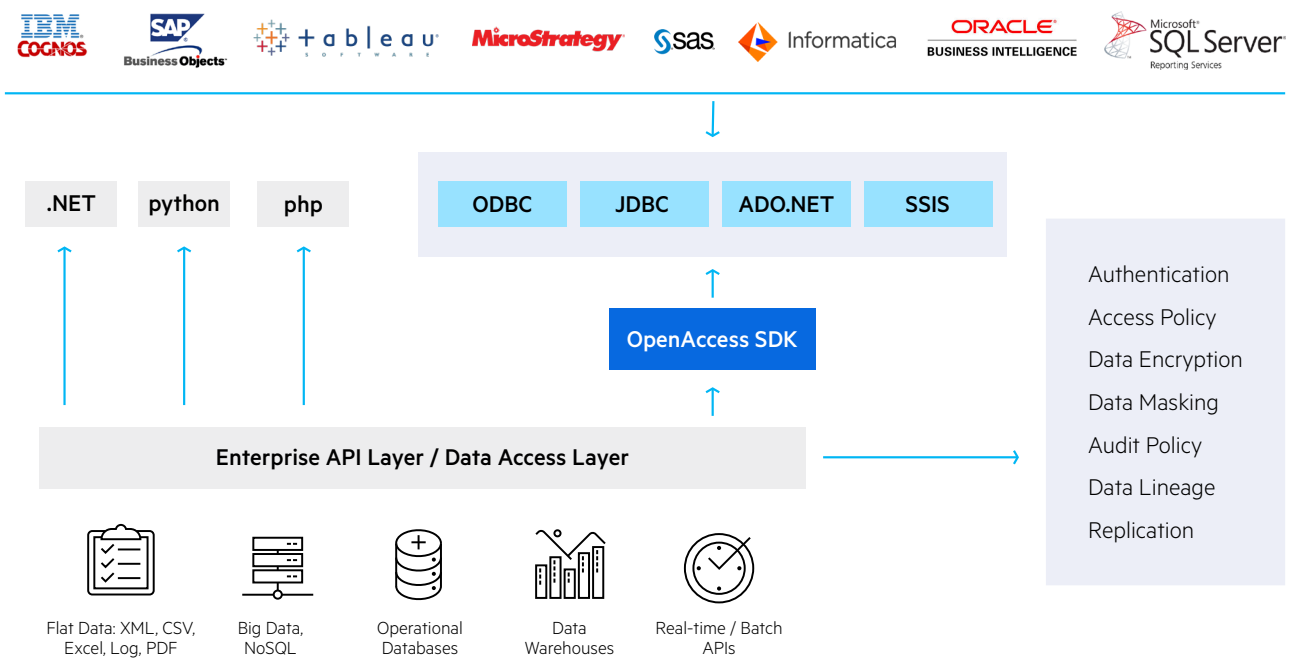
- **Optimized query performance**: Ideally, your enterprise API should support filtering conditions to limit the amount of data returned so you don't sacrifice performance when going through the service layer. If the backend data source supports filtering, you can also take advantage of that when SQL queries are being processed so you can push down expressions, filters and joins. Alternatively, the solution should provide a robust SQL engine to optimize query performance.

- **Rich SQL support**: BI and ETL tools can generate complex SQL queries, so the solution should provide extensive SQL support.

DataDirect OpenAccess SDK

Many industries such as financial services, healthcare and technology rely on Progress® DataDirect® OpenAccess™ SDK to build a custom ODBC, JDBC, ADO.NET or OLE DB layer on top of their internal APIs. OpenAccess SDK provides direct SQL access from BI tools while leveraging centralized API features such as:

- Access to real-time data and business logic or financial calculations
- Monitoring of data access for unauthorized usage or external attacks
- Enforcement of existing access controls across teams and organizations
- Detailed data lineage to provide end-to-end audit trails
- Authentication using access control and identity management products such as CA Siteminder, Oracle Access Manager, Entrust Get Access and RSA Access Manager



OpenAccess provides up to 99% of the code required to SQL-enable a data source. You only need to generate a small amount of code (IP) that is specific to your data source. This includes 12 functions that can be written in C, C++, Java or .NET. This same IP code can be re-used for any type of driver—no code changes.

"Reduce data movement. Keep business logic within the data layer, not embedded within the BI solutions."

Gartner Presentation, "Is One Business Intelligence Tool Enough?", Soyeb Barot, Gartner Catalyst Conference, August 2017

All the code for the ODBC, JDBC, OLE DB, ADO.NET APIs is implemented for you, as well as the SQL processing and network communications. The finished driver is guaranteed to be compliant to the driver API specifications and compatible with hundreds of applications written to these specifications. OpenAccess also includes a REST IP Generator that enables you to build a driver for any REST data source quickly and easily.

Deliver your own fully branded open connectors built on a code base that is certified across third-party applications such as Tableau, Excel, Qlik, Spotfire, Alteryx, SSIS, IBM Cognos, SAP Business Objects and Informatica PowerCenter. OpenAccess includes run-time installers for ease of distribution to your data analytics teams and external developers and customers.

Other Use Cases for Virtual SQL Access

Application / Business Logic	Abstraction	Multi-Tenancy
Build connectivity to the business logic layer for ERP, CRM, marketing or finance systems	Expose a single interface distributed across large objects in NoSQL database vs. transactional records stored in a SQL database	Enforce tenant-level security at the driver level without touching the hosted architecture

OpenAccess Integrates with the Existing Enterprise Security Infrastructure

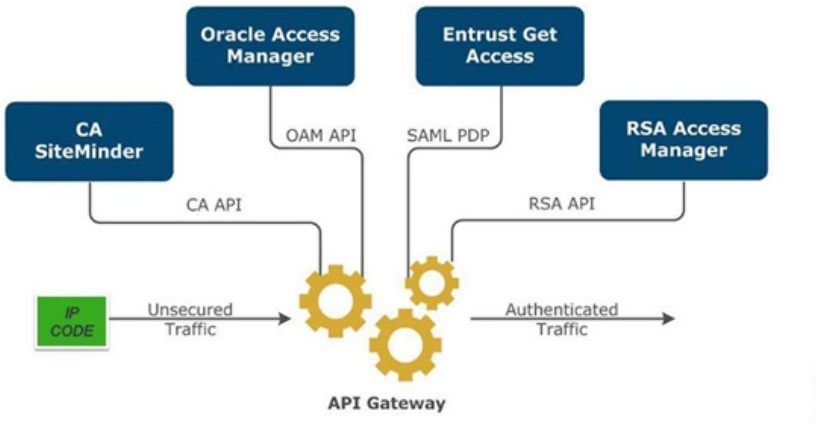


Image Source: Oracle Fusion Middleware Gateway Administration

OpenAccess gives you control at different points of processing so you can integrate with enterprise security systems for authentication, data access and control at the level of SQL statements and table/column access.

CASE STUDY

Challenge:

The BI team for a large financial company needed access to the data access layer from Microstrategy and IBM Cognos. New applications must be authorized by the company's internal authentication and security layer.

They developed an in-house custom JDBC driver and it wasn't performing well. The driver had compatibility issues and required a lot of maintenance to support the JDBC spec to the level required by the BI tools. They also needed an ODBC driver to support a new BI tool within a strict timeline. This would require finding an ODBC expert and developing the driver from scratch. And in the end, they were worried that they might end up in a similar situation as that of their in-house JDBC driver.

Solution:

With OpenAccess SDK, they could deploy both an ODBC and JDBC driver with one effort by using the same code. OpenAccess didn't require expertise in ODBC or JDBC.

Result:

OpenAccess works seamlessly with all of their 3rd party authentication and security tools.

Key Features

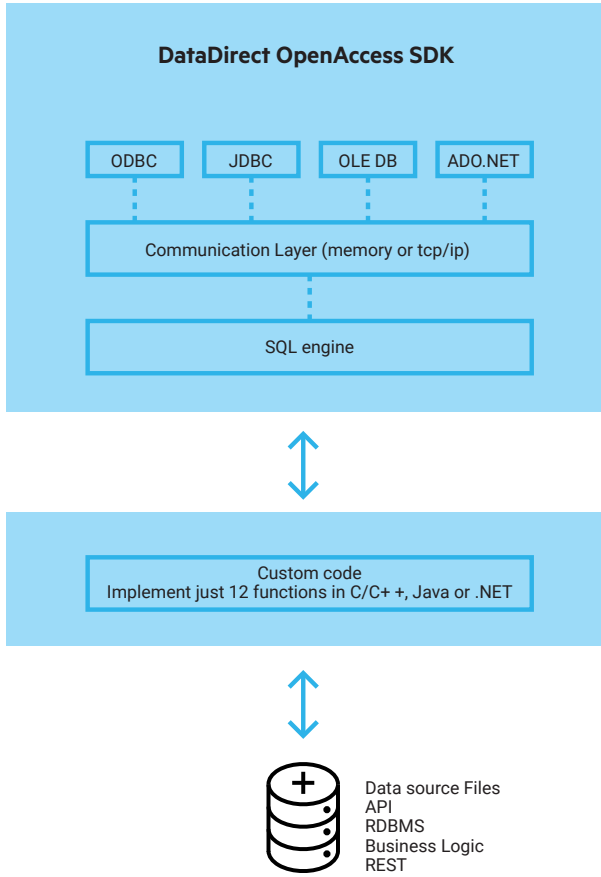
- OpenAccess SDK is the ideal solution for real-time access to your API layer from popular off-the-shelf commercial tools used by enterprises worldwide
- Unparalleled compatibility with enterprise analytics and data management infrastructure
- REST API Generator makes it easy to consume a REST API through ODBC or JDBC
- Powerful SQL Engine allows complex queries to be efficiently executed in cooperation with your data engine
- Data security ensured with numerous advanced authentication choices including Kerberos, Active Directory, Proxy Authentication and SSL/TLS encryption
- Broad platform support allows the query processing to occur on any platform, including Windows, Linux and Unix, and allows client applications to run on any of these platforms
- Support for C, C++, Java or .NET for integration with your existing API
- SQL 92 compliant to allow queries with joins, unions, nested query, stored procedures, insert, update, delete, group by, order by, and other SQL syntax to be executed over any data source
- High level of compliance to data access specifications
- Optimized query execution allows the work to execute the query to be done all by the OpenAccess SQL engine, or it can be selectively pushed down to the data source for the best performance
- White label support for distribution with your software solution

Customized SQL Connectivity

It is the same code whether you are supporting ODBC, OLE DB, JDBC or .NET.

OpenAccess SDK provides the majority of the code needed to SQL enable a data source. You generate the small amount of code (IP) residing between the SQL engine and your data store. This code processes the results generated by the SQL engine.

The IP can be written in C, C++, Java or .NET.



Steps to Create a Driver

In most cases, you can get an OpenAccess POC up and running in just a couple of hours. From there, development can be iterative, adding capabilities as you go. Here are the simple steps to build a driver:

1. **Design**: Decide what APIs you want to expose
   - Define the schema
   - Determine how the API will interact with the SQL Engine

2. **Set up**: Decide what features you will support (e.g., CRUD)
   - Implement the IP API functions by starting with our template, examples in different programming languages or API Generator

3. **Test**: Test sample queries through provided SQL Testing Tool or other tool
   - Package for distribution internally or if you're a software vendor, for customers

Why Progress?

- Eight of the vendors recognized in the February 2017 Gartner Magic Quadrant for Business Intelligence and Analytics Platforms license our technology
- Gartner named Progress a Representative Vendor in the August 2017 Market Guide for Data Virtualization
- The world's largest financial institutions and more than 100 enterprises use OpenAccess SDK to create SQL clients for their data sources or APIs
- More than 350 leading software vendors distribute our technology
- OpenAccess components are backed by the industry's trusted Security Vulnerability Response Policy that includes constant vigilance for the next security vulnerability in your data access layer
- **Risk averse organizations partner with Progress (NASDAQ:PRGS) who is ranked third in market share for Worldwide Data Access Infrastructure Software by IDC**

OpenAccess allows you to be at the forefront of the analytics wave, by allowing you to quickly deploy SQL clients on top of your API layer. With OpenAccess, you get the best of both worlds: continue to use your favorite enterprise BI tools and integrate with your secure enterprise API layer.

To get familiar with OpenAccess and test it with your API, try it free for 30 days. See the tutorials below to get a POC up and running in just a couple of hours.

Download a free trial

About Progress

Progress (NASDAQ: PRGS) offers the leading platform for developing and deploying mission-critical business applications. Progress empowers enterprises and ISVs to build and deliver cognitive-first applications that harness big data to derive business insights and competitive advantage. Progress offers leading technologies for easily building powerful user interfaces across any type of device, a reliable, scalable and secure backend platform to deploy modern applications, leading data connectivity to all sources, and award-winning predictive analytics that brings the power of machine learning to any organization. Over 1,700 independent software vendors, 80,000 enterprise customers, and 2 million developers rely on Progress to power their applications.

Learn about Progress at **www.progress.com** or +1-800-477-6473.

About DataDirect

Progress® DataDirect® delivers powerful data connectivity for applications running on premise or in the cloud. Get connected to the vast data landscape using a single standard interface with SQL or REST. DataDirect connectivity solutions support the full range of relational, cloud, NoSQL and big data sources across trusted industry standards, including ODBC, JDBC, ADO.NET and OData (REST). Learn more at www.progress.com/datadirect-connectors

Learn More:
Overview: OpenAccess SDK
Overview: Provide Real-Time Data to Financial Applications
Webinar: Deliver Secure SQL Access for Enterprise APIs (includes REST API demo)
Tutorial: Build Your Own Custom ODBC Driver for REST API in 2 Hours
Tutorial: Build Your Own Custom JDBC Driver for REST API in 2 Hours

Worldwide Headquarters

Progress, 14 Oak Park, Bedford, MA 01730 USA
Tel: +1 781 280-4000 Fax: +1 781 280-4095
On the Web at: www.progress.com
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