

## Enea Polyhedra: Active, Secure, and High-Performance SQL Database

Enea Polyhedra is a fast in-memory SQL database with active technologies that increase performance, protect data integrity, and simplify development. It is designed with low footprint and high availability, and it scales from single node to elastic cloud deployments.

### Key Benefits

- ▶ Memory resident
- ▶ Standards based: C/C++, Java, SQL, ODBC, JDBC, ADO.NET, and OPC UA
- ▶ Continuous availability through Fault Tolerant support
- ▶ Active queries avoid the need for polling
- ▶ Active database triggers to maintain database integrity
- ▶ Optimistic and pessimistic locking
- ▶ Historian module to capture time-series data
- ▶ Heterogeneous client-server architecture
- ▶ Fully transactional and ACID compliant
- ▶ Data replication and subscription
- ▶ Interface to PLCs, RTUs
- ▶ SSL module allow encrypted connections

Enea Polyhedra is used at the core of data-intensive systems deployed in cloud, on-premise or embedded. Its performance, availability, and data integrity protection mechanisms has been decisive factors to design it in to mission-critical systems in telecom, industrial, finance, and embedded applications.

### High Performance

Low latency and high throughput are critical characteristics in many applications. Enea Polyhedra’s memory resident, event driven design enables it to deliver ACID compliant, millisecond-level performance (or better) and service requests that would otherwise be unworkable in time-sensitive environments.

### Active Queries Boost Performance

Active queries further enhance performance by automatically notifying client applications whenever relevant data changes occur, avoiding time- and resource-consuming server polls and re-issued queries.

### Active Behavior Protects Data Integrity

Enea Polyhedra also provides active technology for associating database “behavior” with data, i.e. a behavior that can be triggered by changes of the data. Robustness is significantly enhanced by the set-up of active, triggered, database-resident code, which enables application-level data integrity rules to be built into the database. Embedding “business logic” in this way improves the overall “correctness” of the information in the database.

The database trigger also simplifies development of client applications by centralizing consistency checks and enabling the database to handle changes without the need for external application code.

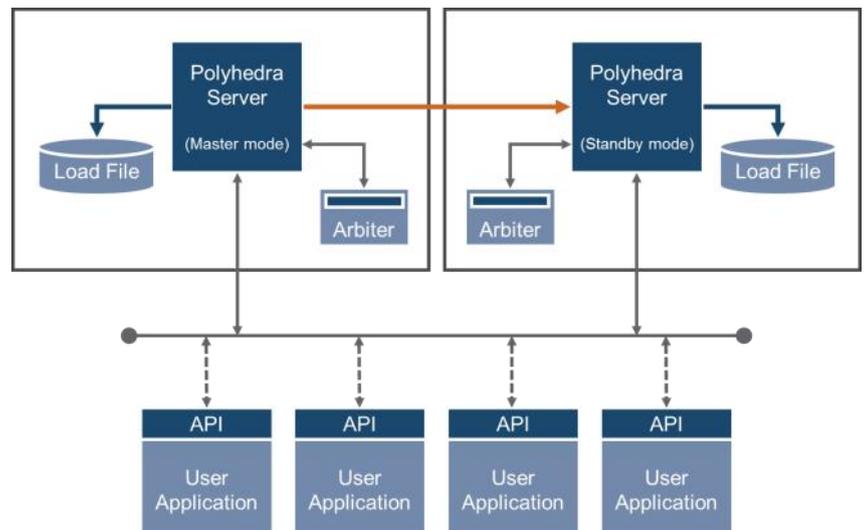


Figure 1: a typical fault-tolerant configuration. When a failover occurs, user applications automatically reconnect from one server to another in a seamless fashion, without the need for special coding in the application. A journal logging mechanism ensures that critical data survives major failures requiring a full restart of the entire system. Replica servers may also be configured, allowing the off-loading of frequent or complex queries to other machines.

## High availability

Enea Polyhedra enhances availability by reducing susceptibility to single points of failure, providing fault-tolerant mechanisms that ensure continuous client operation and transaction integrity.

## Hot Standby

Hot-standby mechanisms maximize availability. The standby database is continually fed changes from the master database, enabling the standby to take over immediately if it receives notification of a failure of the master. In addition, the client libraries can automatically switch over to the new master when they lose touch with the old master.

## Distributed Client-Server Architecture

Enea Polyhedra's client-server architecture enhances data integrity and resilience by separating data from the applications that use it, thereby protecting the memory used by the database software from accidental modification.

## Scales from Single Node to Elastic Cloud

The flexibility in the client-server architecture enables distributed applications to seamlessly access Polyhedra databases, and to scale linearly, from a single node to large clusters and elastic cloud services. The ability to remotely access the database also simplifies system development and testing, even when the system is intended for standalone use.

## Faster Development, Standard Client APIs

Portability and cross platform support greatly enhance flexibility during development and testing. Enea Polyhedra also simplifies application design by offering standard APIs that make it easy to interface client applications with Polyhedra databases.

- For C/C++ developers, Enea Polyhedra provides an ODBC-compliant API with extensions for event-driven programs using active queries, as well as a proprietary API that uses a callback model. Enea Polyhedra provides a native ODBC support library for each supported platform. The library does not require an ODBC driver manager.

- For Java developers, Enea Polyhedra provides a pure Java (type 4) portable JDBC driver, which supports all the features of Enea Polyhedra, including active queries.
- For developers on Windows platforms. Enea Polyhedra provides an ADO.NET data provider which simplifies the usage of Enea Polyhedra databases and the taking full advantage of all Enea Polyhedra features. The ADO.NET data provider is available in 32-bit and 64-bit versions.
- For Python developers, Enea Polyhedra provides a specific Python binding to utilize Enea Polyhedra databases and features.
- For OPC UA developers, Enea Polyhedra provides a sample OPC UA RDI client in source code to help projects get started faster. The OPC UA client provides access to data stored in an OPC UA server.

## Use Cases

Enea Polyhedra is used in cloud and stand-alone applications where its compact size, speed, availability and intelligence provides benefits:

- Telecom
- Industrial and SCADA
- Financial systems
- IoT devices and gateways
- Cybersecurity
- Embedded devices

## Supported Platforms

Enea Polyhedra supports the following runtime platforms:

- Linux
- Windows
- Embedded RTOS platforms

More information about Polyhedra is available at:

[www.enea.com/polyhedra](http://www.enea.com/polyhedra)



Enea develops the software foundation for the connected society with a special emphasis on reducing cost and complexity at the network edge. We supply open-source based NFVI software platforms, embedded DPI software, Linux and Real-Time Operating Systems, and professional services. Solution vendors, Systems Integrators, and Service Providers use Enea to create new networking products and services faster, better and at a lower cost. More than 3 billion people around the globe already rely on Enea technologies in their daily lives. For more information: [www.enea.com](http://www.enea.com)