ITTIA DB SQL™ – v8

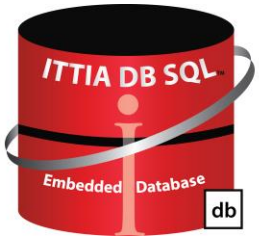
Secure Data Management Software for IoT Edge

ITTIA DB SQL Delivers:

- Fast, Safe, Scalable Database Software
- Effective SQL to Filter and Process Edge Data
- Deep Real-Time Insights into Edge Data
- Security – Safeguard Embedded IOT Data
- Small Footprint – Best Performance
- Cross-Platform Embedded Database Library

ITTIA provides time series database and IoT stream pipeline processing software for edge embedded devices. ITTIA DB SQL enables manufacturers to silently embed powerful and reliable data management software to securely collect, process, and act on fresh information in real time. The ITTIA DB SQL transaction engine is designed with standards for scalability, ease of development, and maintainability. ITTIA DB SQL IoT processing engine is developed to monitor, filter and understand real time data. Included utilities and security features provide full database functionality for building next generation products on desired Arm, x86-64 and other important architectures.

ITTIA DB SQL facilitates data storage and distribution between IoT edge devices. It empowers devices to process a high volume of current sensor reading data but only store and distribute important measurements, events, and other timestamped metrics.



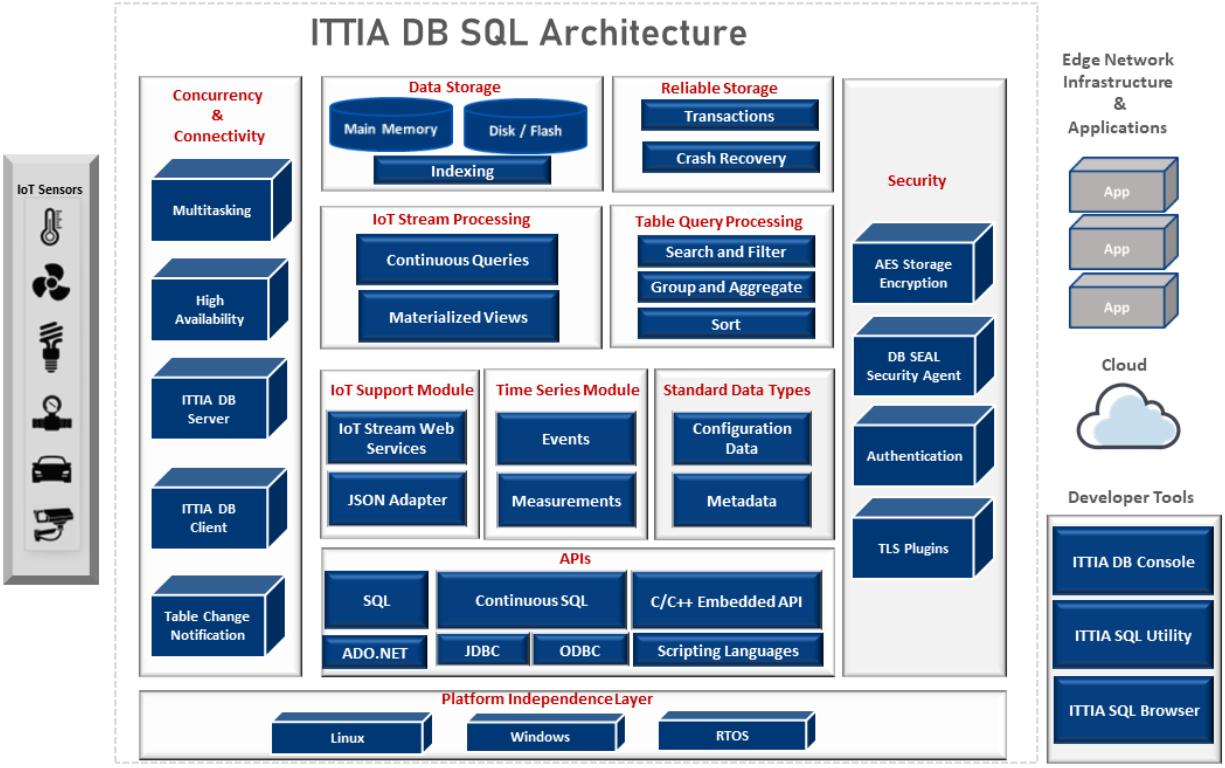
"Servomex's selection of ITTIA DB SQL for use within our next generation solutions is based on a combination of ITTIA characteristics including technical capability/performance, breadth and ease of OS and middleware integration, value, commercial clarity and flexibility, and, most importantly, a demonstrable commitment to maintaining a long term mutually beneficial working relationship. ITTIA have consistently delivered on their promises."

CTO, Servomex, the world leader in gas analysis

Edge Device Data Management and Processing Software

SDK for Real-time View into Device and Embedded System Data

Capture Metrics, Events, Traces, and Act on Autonomous IoT Device Information



Data Management Features

DATABASE FOR AUTONOMOUS SYSTEMS

Developers embed ITTIA DB SQL to ensure high availability, reliability, and security in device applications, with no need for a database administrator. With support for a variety of real time operating systems and hardware architectures, ITTIA DB SQL is a full featured embedded database ideal for both microprocessor & microcontroller application development.

HIGHLIGHTS

- IoT and Industrial IoT
- SQL
- Full ACID compliance
- No DBA
- Embedded or client/server
- Single- or multi-core
- High performance
- Small footprint

KEY FEATURES

- TCP/IP, TLS remote access
- XML/JSON import/export
- Disk I/O management
- Replication
- Two-phase commit
- High availability and clustering
- Database mirroring
- Cross platform support
- Platform independent formats
- In-memory, on-disk, hybrid
- Concurrent read and write
- Multithreading/multitasking
- Multiple process support
- Full storage encryption

EXTENDED IOT CAPABILITIES

- Performance
- Low Latency
- High Throughput
- Web Services Protocol
- JSON Data Adapter
- Raw Binary Data Format
- Sequence generators

SQL HIGHLIGHTS

- Runtime DDL
- Foreign key constraints
- Full outer join, cross join
- Union, except, intersect
- Case expressions
- Identity column auto increment
- Parse, format, extract date/time

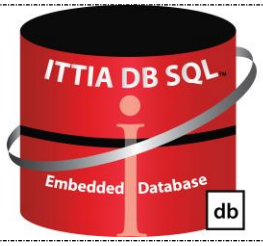
DATA TYPES

- integer, tinyint, smallint, bigint
- float32, float64, currency
- Unicode: UTF-8, UTF-16, UTF-32
- date, time, datetime, timestamp
- interval day to second
- interval year to month
- Boolean,BLOB, varbinary

DATA INTEGRITY

- ACID transactions
- Isolation levels
- Rollback
- Savepoints
- Automatic crash recovery
- Multiple concurrency models
- CRC page/log verification

In order to bring our proven FlexCtrl solution to the next level and make it fit for the Industrial IoT, we needed a much more flexible and robust storage solution for the historic data. Our systems collect and manage data for many years, and this is the digital gold that our customers harvest. Data must be handled by a safe, secure and robust database, and we recognized that we needed a special partner helping us achieve this. ITTIA DB SQL provided all the core features we needed right in their standard product and was therefore a natural choice."
CEO, BitCtrl, IIoT Automation System



Data Processing Features

IOT EDGE DATA PROCESSING DATABASE	HIGHLIGHTS
When data produced by IoT devices can be processed directly on the IoT edge network, devices take action quickly and efficiently. ITTIA DB SQL processes continuous queries in real time and pushes the results for applications to take immediate action. It delivers low latency response time when capturing data from many IoT devices at high update frequencies.	➢ Push and pull IoT Streams ➢ Materialized views ➢ Continuous SQL queries ➢ Filter ➢ Time Window ➢ Aggregate ➢ Group

DATABASE FOR TIME SERIES IOT DATA

To capture IoT data on flash media, the ITTIA DB SQL writes materialized views directly into an integrated relational edge database. Device applications pull captured data with on-demand SQL queries to efficiently filter over any time range or indexed attribute.

MANAGING MASSIVE FLOW OF EDGE DATA

Continuous SQL queries enable edge applications to filter, group, and aggregate IoT sensor readings. Developers submit expressive continuous SQL statements to ITTIA DB SQL so that each application only receives the information it needs to take action and update business-critical summary reports.

Flexibility Matters

Cross platform compatibility	SUPPORTED PROCESSORS
Supported Operating Systems: Linux, Windows, RTOS **Development:** C/C++ SQL, ODBC, JDBC Python, PHP, Ruby, Lua	➢ i.MX Applications Processors ➢ Layerscape Communication Processors ➢ Texas Instruments ➢ Xilinx ➢ Altera ➢ STMicroelectronics ➢ Renesas ➢ ARM ➢ Power Architecture ➢ Intel 32-bit and 64-bit

Database Tools:

ITTIA DB Console, ITTIA SQL Browser, ITTIA SQL Utility, Synchronization Tool, ITTIA DB Server

MAXIMIZE PERFORMANCE

ITTIA DB SQL is designed for high-performance data management by minimizing overhead and effectively utilizing scarce resources. Whether an application needs great overall performance for high-throughput on-disk tables, or low latency access to in-memory tables, ITTIA DB SQL is the best choice.

Data Management and Processing Capabilities

SECURITY AGENT	SECURITY FEATURES
ITTIA DB Security Expert Agent Library (DB-SEAL™) isolates databases stored on devices, chooses between alternatives to mitigate an attack, and keeps the database contents always available. This proactive monitoring of the data and database by DB-SEAL will allow each device to issue an alert, block access, or shut down when data management metrics fall out of the expected range. DB-SEAL is a virtual agent that monitors database responsibilities, input, and data metrics, in real time, and responds by rejecting unexpected requests.	➢ AES-128 ➢ AES-256 ➢ Custom storage encryption algorithms ➢ SCRAM database authentication ➢ SSL/TLS plugins for secure remote access and replication

SCALABILITY

ITTIA DB SQL is specifically designed to bring the robust capabilities of enterprise RDBMS to embedded developers working with C and C++. Each embedded application has a unique balance of memory footprint, latency, storage, and data sharing requirements. ITTIA DB SQL satisfies a wide range of expectations with a common data management framework and APIs.

FLEXIBILITY FOR ANY WORKLOAD

ITTIA DB SQL scales to fully utilize any hardware environment. Robust indexing and logging algorithms guarantee consistent performance for on-disk tables and optimal performance for in-memory tables. ITTIA DB SQL uses main memory intelligently to minimize expensive flash and disk operations.

RELIABILITY	AVAILABILITY
ITTIA DB SQL protects data by grouping related changes into atomic transactions. Transaction logging ensures that important information is never lost, and the database is protected from corruption. When an unexpected power failure occurs, tables are automatically repaired to the last completed transaction.	➢ High Availability ➢ Mirroring ➢ Hot backup ➢ Asynchronous bidirectional replication ➢ Synchronous replication on commit ➢ RDBMS synchronization

For more information, visit www.ittia.com. Additionally, if you need assistance with edge device data processing and management, ITTIA offers a **JUMP START** with complementary consultation.