

What is GT.M?

GT.M is a database engine with scalability proven in the largest real-time core processing systems in production at financial institutions worldwide, as well as in large, well known healthcare institutions, but with a small footprint that scales down to use in small clinics, virtual machines and software appliances.

The GT.M data model is a hierarchical associative memory (i.e., multi-dimensional array) that imposes no restrictions on the data types of the indexes or the contents - the application logic can impose any schema, dictionary or data organization suited to its problem domain. GT.M's compiler for the standard M (also known as MUMPS) scripting language implements full support for ACID (Atomic, Consistent, Isolated, Durable) transactions, using optimistic concurrency control and software transactional memory (STM) that resolves the common mismatch between databases and programming languages. Its unique ability to create and deploy logical multi-site configurations of applications provides unrivaled continuity of business in the face of not just unplanned events, but also planned events, including planned events that include changes to application logic and schema.

Worldwide, GT.M is used in multiple industries, including finance, health care, transportation, manufacturing and others. GT.M supplies the processing power to the FIS Profile™ enterprise banking application, which runs several of the largest real-time core-banking systems in the world.

The technology is a vetted, industrial strength platform for building high-throughput database applications for both host-based and client/server architectures. GT.M has several benefits as a database platform, which transaction-processing applications will find advantageous. They include:

- GT.M's database is typically 20 to 50 percent the size of equivalent databases on industry-standard SQL engines.
- GT.M's database supports full ACID (Atomic, Consistent, Isolated, Durable) transactions.
- It is substantially faster for transaction processing than traditional relational databases.
- With a multi-dimensional key-value (also known as “NoSQL”, “schema-free”, “schema less”) model, GT.M's database engine imposes no schema restrictions.
- With support for Unicode (ISO/IEC-10646), GT.M is well suited to creating applications that require international character sets.
- SQL/ODBC/JDB access to GT.M databases is available from multiple sources.

History

MUMPS' origins date back to 1966, when MUMPS (an acronym for Massachusetts General Hospital Utility Multi-Programming System) was developed by the Massachusetts General Hospital and the Massachusetts Institute of Technology. Standardized as "M," (ISO/IEC 11756:1999) the system was designed as an integrated programming language, programming environment, file system, operating system, and database. Its performance and flexibility

permitted researchers to write complex database applications that could run on inexpensive minicomputers, instead of requiring expensive mainframes. Since the early 1970s, MUMPS has been a defacto standard in healthcare informatics.

M programmers relish M because the database is highly accessible with a familiar paradigm, built in string processing, and dynamic data typing along with familiar programming constructs such as "If Statements," "For loops," etc. Furthermore, with add-on tools from FIS and third parties, it is possible to map a GT.M database onto a relational data dictionary, and provide access via standards such as SQL and ODBC/JDBC. Tools for object encapsulation and object oriented programming are also available.

In the 1980s an even more powerful technology alternative to prevailing M implementations evolved, called GT.M. This technology was developed by Greystone Technology Corp. Unlike traditional M systems that integrated the database and language subsystems in a closed architecture, GT.M was designed to have an open architecture, like a programming language such as C. Thus, M programs reside in normal ASCII files in the operating system (with a .m extension), and are compiled by a compiler into object files (with a .o extension) that are also normal files. However, GT.M was designed not to sacrifice the dynamic nature or performance of the M environment. To this day, transaction processing throughput occupies prime mind share of every engineer who works on GT.M, second only to robustness.

Since GT.M's first deployment in 1986 on a VAX/VMS system in a major medical hospital, it has made notable inroads in the medical and financial industries. GT.M is used at countless institutions worldwide, ranging from small, community healthcare facilities and large teaching hospitals to some of the largest financial institutions in the world. Our clients entrust their mission critical applications to GT.M on Linux on x86, and AIX, computing platforms.

In 1998, Sanchez purchased Greystone Technology Corp. and created the "GT.M Group," retaining its human capital and technical expertise. In turn Sanchez was a predecessor company to FIS. FIS continues to invest in GT.M to respond to the market demands for this product as well as to meet FIS Profile needs.

Many innovations that are now commonplace in software technology, such as just-in-time compilation and dynamic linking have always been an integral part of GT.M. Others such as ACID (Atomic, Consistent, Isolated, Durable) transactions were incorporated into GT.M long before the competition. Today, the GT.M Group continues to innovate, pushing the technology envelope with unique functionality such as logical multi-site operation, which allows an application like FIS Profile to offer 24x7, continuous availability, even if a data center is lost, or during an application upgrade that involves a database schema change.

The source code for GT.M on x86 GNU/Linux is available to the world under a free / open source software (FOSS) license. Although that software is free for anyone to use, FIS offers support contracts for users who want to use GT.M for commercial applications and want to purchase support on commercial terms with assured service levels. On this, as well as on all other supported platforms, GT.M is available as a traditionally licensed software product, with the same high quality FIS support.

Links



Fourth Watch Software

Fourth Watch Software provides operating system and database support for Linux/Unix servers and GT.M databases. We also develop software in a variety of different technologies.



George James Software

George James Software was established in 1989 to provide best practice consultancy and training services, focusing on business and systems analysis. We have delivered software services from small businesses to blue chip companies, always with consistent standards and polices. Our international customer base spans several industries, including the Computing, Finance, Retail, Healthcare and Marina markets. The many long-term business relationships that we have demonstrates our customers' trust in us. We are known for our innovative solutions and sound business sense.

Our suite of products that complement GT.M includes:

- [Serenji](#) - the tool of choice for debugging
- [VC/m](#) - complete version control, configuration management and process control system
- [RE/m](#) - to re-engineer application code
- [RE/data](#) - to build data dictionaries for databases



IDEA, spol. s r.o

[IDEA](#) is a [technology](#) company with more than 20 years of experience in many different MUMPS systems, including the GT.M.

We have worked on multiple projects where the PROFILE core-banking system has been involved or where we implemented a variant of our own software built on the top of our IDEA-System and IDEA-WebSystem frameworks.

Our additional value for GT.M and PROFILE users:

- GT.M, PROFILE & PIP/DATA-QWIK [consulting](#)
- custom PROFILE packages for middleware, security, reporting, and web
- [IDEA EGTM](#) aka "GT.M for Erlang/OTP"
- IDEA Object Database (IODB) for Erlang/OTP
- experimental GT.M ports to FreeBSD, DragonFlyBSD and Solaris/x64
- GT.M is a default option for SaaS version of the traditional IDEA ERP/CRM.

We also provide [migration and virtualization services](#) for VAX and Alpha systems running OpenVMS or Tru64.



Knowledge Based Systems, Inc. (KBS)

Knowledge Based Systems, Inc. (KBS) provides real-time data access and reporting solutions for applications. Through partnerships with some of the most comprehensive application providers, KB_SQL brings several choices for data extraction, production and ad hoc reporting. Connectivity options for ODBC, JDBC, and ADO.NET provide support for common desktop applications. KB_SQL is in daily production use with VistA on GT.M, and since 1997 has been in production use with multiple applications on GT.M.



M/Gateway Developments Ltd

M/Gateway Developments Ltd specializes in advanced web application technologies and in integration and middleware technologies. We innovate in web application development, XML and the integration of third-party software and applications with GT.M. We can provide expert advice and training on Node.js, in particular with respect to its use with GT.M

Our [innovative](#) suite of free / open source software that complements GT.M includes:

- EWD: our advanced web and mobile web application development technology and Ajax framework;
- M/Wire: a TCP-based protocol for accessing and manipulating GT.M databases;
- M/DB: a "plug-compatible" alternative to Amazon SimpleDB;
- M/DB:X - a powerful hybrid JSON/Native XML database.



Sea Island Systems, Inc.

Sea Island Systems, Inc. creates and supports enhancements of the VistA Electronic Health Record (EHR) software and its derivatives. These services include interfacing VistA with external Health Information Systems, Financial Systems, or specialized applications. We also create custom extensions to the VistA data dictionary for elements that are not native to VA VistA, as well as programming of options and remote procedures (client-server applications), and so forth. Our range of programming services covers all commonly implemented applications in VistA. Additionally, Sea Island Systems has successfully transported and adapted the VistA EHR from other platforms to GT.M.



VISTA Expertise Network

Comprised of computer professionals with deep knowledge of VISTA, VISTA Expertise Network exists to provide the hospitals and clinics with the knowledge and experience needed for rapid and smooth implementation of VISTA. Working with national experts and project managers, VISTA software engineers deliver onsite and remote services to support hospitals and clinics to fully exploit the remarkable potential of this public-domain software. VISTA Expertise Network is the only organization following the VISTA cultural model that includes: a multi-tiered support architecture; user-driven development cycle; convergent community code base; and an autonomous package-based team approach.



WorldVistA

WorldVistA was established to facilitate open, collaborative improvement and adaptation of the VistA electronic health record, distributing WorldVistA EHR for the benefit of health systems across the world. In support of this goal, WorldVistA grows and supports an international community of open source developers and VistA adopters by organizing VistA community meetings, online training and participation in discussion forums. WorldVistA strives to guide VistA adopters and programmers towards developing a community based on principles of open, collaborative, peer review software development and dissemination.

FAQs

Can I access my database with SQL/ODBC/JDBC?

Yes, even though the GT.M database engine imposes no schema on the data, you can map relational tables to the data if the structure of the data permits it (all tables can be mapped to a key-value organization, but not all key-value organizations can be mapped to a relational organization). FIS PIP is a free /open source (FOSS) tool with commercial support that has such a mapping capability and provides SQL/JDBC access. KB_SQL is a third-party product from Knowledge Based Systems. FIS Profile provides its own SQL/ODBC/JDBC access as part of the application suite.

How do I web enable my GT.M application?

There are several FOSS approaches. GT.M includes the ability to deploy a web service under the control of an "Internet superserver" such as inetd or xinetd. A tool such as EWD.js from M/Gateway provides a very sophisticated approach to developing web applications that use a GT.M back end. A simple CGI interface to GT.M from any web server is trivially written in M. Note that FIS Profile includes its own messaging services for web enablement.

[DataBallet](https://github.com/lparenteau/DataBallet) is a web written in GT.M which can be downloaded from <https://github.com/lparenteau/DataBallet>

What is FIS?

FIS is a global leader in financial services technology, with a focus on retail and institutional banking, payments, asset and wealth management, risk and compliance, consulting and outsourcing solutions. Through the depth and breadth of our solutions portfolio, global capabilities and domain expertise, FIS serves more than 20,000 clients in over 130 countries. Headquartered in Jacksonville, Fla., FIS employs more than 55,000 people worldwide and holds leadership positions in payment processing, financial software and banking solutions. Providing software, services and outsourcing of the technology that empowers the financial world, FIS is a Fortune 500 company and is a member of Standard & Poor's 500® Index. For more information about FIS, visit www.fisglobal.com

FIS develops GT.M and supports it commercially.

On what platforms is GT.M available?

As FOSS, GT.M is available on GNU/Linux for the x86 architecture (both 32- and 64-bits). Under a proprietary license, GT.M is available on GNU/Linux for the x86 architecture, as well as AIX on IBM pSeries.