VISTA Community Meeting
Day Three: January 16, 2011
Afternoon Session

Topic: Introduction to GT.M

Presenter: K.S. Bhaskar, Fidelity Information Systems

Fidelity Information Systems (FIS), the developer of GT.M, is a company based in Jacksonville, FL, the largest technology provider to the global financial industry. GT.M is a small but important part of the company's activities.

What is GT.M?
It is an implementation of MUMPS (database engine, compiler, system management solutions), which features a transaction processing database application platform with key-value datastore. It is highly scalable, robust, and secure; it uses open architecture. Open architecture integrates well with operating systems and leverages existing software.

For security and integrity, GT.M uses the underlying operating system. Processes run as user-level processes. All updates are recorded in the journal file (which is never reused). Encryption protects data at rest; a developer can chose which algorithm to use for encryption.

Technical notes: GT.M is about the same as other implementations of MUMPS. Operating costs are low, processes can be automated. Production systems are easier to manage, for VISTA or for the financial sector. It includes unicode support for internationalization.

Continuity of Business: The current standard allows about 5 minutes of downtime per year. The problem isn't so much unexpected downtime; it's more about planned downtime. GT.M has a way to create additional instance streams so that functionality remains available even while parts of it are down undergoing maintenance.

All updates are written first to the journal file, then to the actual database.

If the main instance goes down, a secondary instance becomes the primary. When the original primary comes back up, it again becomes the primary once it has caught up.

Using a schema change filter, a developer can keep a database up and running while performing an update, even an update that involves a data schema change.

Throughput and Scalability: Since 2005, GT.M has been live on (what was in 2005) the largest real-time core processing system in daily production use at any bank. Processing volumes have grown 50% since then. Databases in hundreds of gigs are very common. One US bank processes millions of accounts on an x86 Linux platform using GT.M.

Licensing: Free/Open source software on x86 GNU/Linux and HP Alpha/AXP Open VMS. Reasonably priced on other platforms. All are supported on a commercial basis.

Coming up: LMX, which will feature two concurrent primary instances. The two servers talk to each other and keep each other updated. For this to be meaningful, the system needs to be using transaction processing. Banking applications can do this; VISTA should support transaction processing soon so as to take advantage of this.

LMX is a few years down the road, but it is actively being worked on. http://fis-gtm.com

Questions: ks.bhaskar@fisglobal.com

Q: When patching for Oroville, I encountered an error that the subscript was too long.
A: You get that error if the subscript exceeds the portability standard.

Q: If the subscript exceeded the standard, what is VA using?
A: Not GT.M

Q: It was setting cross-references. The ones without the $EXTRACT were being rejected. So it seems that the programmers weren't paying attention.
A: One thing we introduced is this functionality called triggers, which you can use to maintain cross-references in GT.M. If there are multiple triggers, one of the specs is there should be no specification about the order of triggers. We want the ability to change the order and not have the application stop working.

Q: You said that healthcare institutions have this software?
A: Yes. Oroville Hospital. And there's an execution in Rochester, Minnesota. There's also a lab system in Maine and others.