

GoldMine[®] Performance Tuning

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GoldMine® Performance Tuning

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GoldMine® Performance Tuning

White Paper

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Abstract

This paper presents a performance-tuning framework for the analysis of GoldMine system operation. Designed for the GoldMine administrator and management executive it discusses performance bottlenecks and provides various recommendations for optimising GoldMine for better performance. These recommendations are the result of the extensive experience of the ASAP Group GoldMine consultancy team.

1. Introduction

GoldMine has been heralded as the best of breed solution, with more than 10 years of proven experience for affordably managing customers and automating Sales and Marketing processes. GoldMine 8.x centralises information, facilitates communication across teams and establishes one-to-one business practices for maximum effectiveness. GoldMine 's performance has been improved over its previous versions.

2. Technology Overview

This section of the paper contains general information on how the technology is designed to work and areas that can impact the performance of the GoldMine system.

2.1 How GoldMine Works

There are two basic versions of GoldMine - one using dBase database and another using MS-SQL Server. The dBase version of GoldMine (GoldMine 5.x) works on file server architecture and SQL Server version of GoldMine (GoldMine Sales & Marketing) works on client/server architecture.

File Server Architecture

In a file server architecture, shared database files reside on a file server, which is typically a dedicated PC that stores shared files for network access. Each connected PC runs GoldMine, which requests data from the server. After receiving a request from a workstation, the server returns a block of data across the network.

The requesting workstation retrieves and stores this block of data. The workstation then performs the final processing required to extract the specific data from the data block locally.

File server architecture performs well in light usages of small databases. As more users are connected to the database, more blocks of data are being sent across the network. This results in a large amount of network traffic and can lead to deterioration in performance.

Client/Server Architecture

The client/server architecture uses Local Area Network (LAN) resources more efficiently to reduce network traffic and responds to requests for data while maintaining data security. The client/server architecture effectively divides the functions of the GoldMine system between the workstations and the server(s).

Each workstation runs the installed GoldMine application and this acts as a front end to the database. The server hosts the database on the MS-SQL platform that maintains and administers the database.

A workstation makes a request for data from the server. The server runs the query against the database. Processing on the data occurs on the server, so the server sends back data in the final form required by GoldMine. The client/server model using MS-SQL reduces the amount of traffic being sent across the network.

2.2 Synchronisation

GoldMine offers unattended, automated processing of remote synchronisation across one or more GoldMine databases, systems and users to be able to send and receive changes to the latest updates. The GoldMine local/remote systems connect in a number of ways to the server GoldMine system. They are grouped into un-connected and connected methods. Synchronised data includes contact information, scheduled & history activities, system information, user preferences, inked documents, etc.

2.3 Automated Processes

GoldMine automated processes are aimed at automating routine tasks such as scheduling activities, printing letters, sending email, regularly performed by GoldMine users.

3. Performance Metrics

System performance is measured by the overall amount of I/O, memory, and CPU time that your system uses to process programs. The performance of a computer running GoldMine depends on numerous interdependent factors discussed below:

3.1 Connection Speed & Latency

When users think about their connection to GoldMine, they usually think only in terms of connection speed. However, connection speed is only half of the performance equation. Latency is another major factor. Latency is the amount of time it takes for a request to a server to return to the client including the processing time. A user could have a reasonably good connection, but be so far away geographically that latency becomes a performance issue. Factors that affect latency include:

- Distance to the server
- Number of routers in the network
- Processing time on the server

Reducing the number of requests made to the server can reduce the influence of latency.

3.2 Network

The following are factors that can affect performance in a network environment. Each of the following key components interactively affects the performance:

- A system with many dependencies can become overloaded and process requests slowly
- A network architecture that uses many routers
- A network architecture where some users are geographically distant (e.g. users in Glasgow with servers in London)
- Processing power of the server
- Amount of RAM on the server
- Number of users accessing the server
- Hardware specifications of server and work stations
- Network bandwidth

The kind of connection the user has to the Network GoldMine, and whether the user is working offline or online, has the greatest impact on performance. Working offline means that the user has a replica of the data

residing on the server and is working with that local copy of the data. Working online means that the user is working against a live copy of the data on the server, whether the user keeps a replica or not.

Connecting to GoldMine

Connecting to GoldMine via telephone line is generally the slowest connection method. Telephone line is for dual use, and not dedicated to a network connection.

DSL, ISDN, or Cable Modem connections are faster than traditional dial-up. Latency can still be a factor for these users, particularly if the users are geographically far from the main servers.

Connecting to GoldMine via VPN (VPN is a virtual private network that allows to use the Internet as part of the network infrastructure by encrypting the traffic that goes over the Internet.), adds an additional 30-40% overhead to each network request. Be aware that even a good connection, such as a cable modem, may not be as fast as desired or required.

In the above cases, it is convenient for the user to run the local replica of GoldMine, and synchronisation is scheduled to happen periodically or on demand to update the local replica.

When Terminal Server is used to access GoldMine, both are physically close to each other, which improves the performance. Performance is fast because GoldMine is running on the terminal server and no actual items are downloaded. This can be faster since the user is merely viewing what is stored on the server.

3.3 Hardware/Software

It is estimated that 70% of all GoldMine issues are related to configuration problems. Installing GoldMine on a latest windows operating system that has yet to be fully tested, may lead to serious problems.

A mixed network consisting of different computers with different hardware is another potential problem area. A Computer with different video drivers, for example a mix of Windows Vista/ Windows XP/ Windows 2003, different motherboards, device drivers, Ethernet cards, modems etc., will pose major opportunities for configuration difficulties.

Old computers with slow processors cannot run today's modern software efficiently. Make sure your hardware meets, or preferably exceeds, the

minimum hardware requirements for GoldMine recommended by FrontRange Solutions. If there is the option to upgrade the hardware, or to make purchasing decisions for new computers, additional RAM will improve the performance best for the extra cost.

A slow computer means lost productivity and costs you money. It makes financial sense to get the best affordable performance. In fact, GoldMine demands it. Server RAM and CPU requirements depend on the following factors:

- Number of contact records in the database
- Number of profile records in the database
- Number of history records in the database
- Number of user-defined fields in the database
- GoldMine Database size
- Number of automatically generated indexes

4. Performance Tuning

Performance tuning is as much an art as a science. Every configuration choice affects performance, sometimes in unexpected ways. Performance tuning provides configuration choices that optimise the performance for current needs, but still offer room for later expansion.

Tuning performance involves configuring many parts of the system. Simply installing a faster CPU or adding RAM may not be the best option. Configure hardware and network according to FrontRange Solutions guidelines and known benchmarks.

4.1 Performance Tuning Steps

Once the correct compatible hardware and network configuration have been found (as per FrontRange Solutions Hardware Compatibility Matrix), the tuning process can begin.

The goal of performance tuning is to find and eliminate the performance bottleneck in each particular system. Performance tuning includes general system and software configuration, but the primary resources to tune are:

- RAM and Virtual Memory
- Disk Subsystem
- System Processors
- Network Interface

The steps outlined later in this section are a guide to tuning systems for maximum performance.

Step1: RAM and Virtual Memory Tuning: Insufficient RAM is the most common cause of server performance problems such as slow disk I/O and overloaded CPUs. Additional RAM will improve performance. Also providing more virtual memory for the applications will increase the performance.

Step2: Disk Subsystem Tuning: The disk subsystem plays an essential role in performance and the reliability of your data. It stores the operating system, applications, and the organisation's data. Factors that affect the performance of the disk subsystem are choice of SCSI interface, file system, and RAID configuration. Note the following:

- Disk fragmentation decreases performance.
- LOG files should be stored on a different physical drive from DATA files.
- LOG files should be stored on RAID 1 if possible.

RAID 1 and RAID 0+1 offer the best data protections and best performance. RAID 5 provides fault tolerance at the best cost, but has half the write performance of RAID 1 and 0+1.

Step3: System Processor(s) Tuning

Processors are the heart of all systems. The performance of an entire system is at risk if the system processor is not performing optimally. One way to reduce processor bottlenecks is to upgrade to a faster CPU. Also identify which processes are consuming the most CPU time, and then devise a strategy to prevent this process from dragging down overall system performance.

Step4: Network Tuning

The network interface card (NIC) frequently slows performance and acts as a single point of failure for crucial networks. Installing a second NIC is one approach to solve this issue. Internet Browsing accounts for nearly 30 percent of Microsoft networking traffic. Minimising the impact of browsing on a network is an important part of optimising overall performance. If multiple local area network connections are in use, then use the available Windows system software or software provided by the network card vendor to combine all LAN connections in one system. This creates a high-performance data pipe that provides output two to four times as fast as systems with one LAN connection. Use super-NIC technology for improved throughput performance and sound load balancing of the request and the subsequent output. It also provides better fault tolerance.

Step5: Operating System Tuning

The Windows 2003 operating system is predominately self-tuning.

Configure the correct page-file size in memory and disable any services and devices that are unnecessary for your environment.

Step6: SQL Server Tuning

In SQL Server most settings are configured automatically. Using TCP/IP sockets to named pipes for network connections to SQL Server provides better performance. Split DATA and LOG files on separate drives. Increase the minimum dynamic memory setting for SQL Server.

Microsoft SQL Server offers several tools including Server Profiler and Index Tuning Wizard to assist in the tuning process.

Step7: GoldMine System Tuning

GoldMine performance tuning includes general GoldMine & database setting configurations as given below:

- Specify the ranges of dates to display specific calendar or history data.
- If GoldMine dBase version is being used, we suggest that the database be re-indexed once a week and perform pack and rebuild every two weeks.
- If GoldMine with SQL Server is being used, then create database maintenance plans to keep GoldMine data free of problems that may result from network errors, corrupted indexes or corrupted data.
- Fine tune BDE settings.
- Install GoldMine files locally to speed up the initialisation process (including gm.exe, .ini files and BDE).
- If users frequently use GoldMine over a slow link, we recommend that they configure synchronisation no more frequently than every 30 minutes so that they can work offline.
- Optimise the synchronization process by being selective in what is being synchronised, including the contacts and the synchronisation frequency.
- Reserve ample disk space when doing transfer sets and pack and rebuilds.
- Remove any unnecessary client side automation processes.
- Use email rules to move unimportant messages from the Inbox to another server-based folder. This will minimise the amount of data that is synchronised.

5. Recommendations

Following are the recommendations for different types of users accessing the GoldMine system:

If a network user is experiencing performance issues, they can configure GoldMine to work offline and use synchronization settings that update everything on a frequent basis, such as every 10-15 minutes.

If the user has a desktop computer, but travels with a laptop computer, then it is suggested that they work online while at the desktop computer, but offline on the laptop computer. The user can also use GoldMine® Everywhere Web Access, which is just another way to work online.

For a user working from home it is recommended that to work offline with a periodic synchronisation schedule. If there is a dedicated and very good Internet connection, such as cable modem, synchronising can be scheduled more frequently.

6. Conclusion

All users will benefit from these improvements. However, those who use the performance tuning recommendations contained in this white paper will gain the most due to the increased flexibility and control over the factors that affect the performance of the GoldMine system.

ASAP offers a regular programme of system health checks as part of the on-going support to the GoldMine system.

Contact us for more information about tuning GoldMine system.

Acknowledgements

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References

GoldMine Administrator Guide from FrontRange Solutions
SQL Server Administrators Guide form Microsoft Press
Network User's Guide from Network Associates

Glossary

Bandwidth: The amount of data that can be transmitted in a fixed amount of time. For digital devices, the bandwidth is usually expressed in bits per second (bps) or bytes per second. For analog devices, the bandwidth is expressed in cycles per second, or Hertz (Hz).

CPU: Abbreviation of central processing unit, and pronounced as separate letters. The CPU is the brains ns of the computer. Sometimes referred to simply as the processor or central processor, the CPU is where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.

DBase: A popular database management system produced by Ashton Tate Corporation. The original version, called Vulcan, was created by Wayne Ratliff. In 1981, Ashton-Tate bought Vulcan and marketed it as dBASE II. Subsequent versions with additional features are known as dBASE III, dBASE III+, and dBASE IV, all of which were owned and developed by Borland Corporation (now Inprise), but were sold to dBASE Inc. in March, 1999

DSL: DSL technologies use sophisticated modulation schemes to pack data onto copper wires. They are sometimes referred to as last-mile technologies because they are used only for connections from a telephone switching station to a home or office, not between switching stations.

Ethernet: Ethernet uses the CSMA/CD access method to handle simultaneous demands. It is on of the most widely implemented LAN standards. A newer version of Ethernet, called 100Base-T (or fast Ethernet), supports data transfer rates of 100 Mbps. And the newest version, Gigabit Ethernet supports data rates of 1 gigabit (1,000 megabits) per second.

I/O: The term I/O is used to describe any program, operation or device that transfers data to or from a computer and to or from a peripheral device. Every transfer is an output from one device and an input into another. Devices such as keyboard and mouse are input-only devices while devices such as printers are output-only. A writable CD-ROM is both an input and an output device

RAM: Pronounced ramm, acronym for **r**andom **a**ccess **m**emory, a type of computer memory that can be accessed randomly; that is, any byte of memory can be accessed without touching the preceding bytes. RAM is the most common type of memory found in computers and other devices, such as printers.

Router: Router is a device that connects any number of LANs. Routers use headers and a forwarding table to determine where packets go, and they use ICMP to communicate with each other and configure the best route between any two hosts. Very little filtering of data is done through routers. Routers do not care about the type of data they handle.

SQL Server: Abbreviation of structured query language, and pronounced either see-kwell or as separate letters. SQL is a standardized query language for requesting information from a database. The original version called SEQUEL (structured English query language) was designed by IBM research center in 1974 and 1975. Oracle Corporation first introduced SQL as a commercial database system in 1979.

TCP/IP: Abbreviation of Transmission Control Protocol, and pronounced as separate letters. TCP is one of the main protocols in TCP/IP networks. Whereas the IP protocol deals only with packets, TCP enables two hosts to establish a connection and exchange streams of data. TCP guarantees delivery of data and also guarantees that packets will be delivered in the same order in which they were sent.

Virtual Memory: An imaginary memory area supported by some operating systems (for example, Windows but not DOS) in conjunction with the hardware. You can think of virtual memory as an alternate set of memory addresses. Programs use these virtual addresses rather than real addresses to store instructions and data. When the program is actually executed, the virtual addresses are converted into real memory addresses.

About Us: ASAP Group is a Professional Services Organisation dedicated to the provision of complete business, people and technology solutions, through creative training, implementation and support programmes. We are leading authorities on CRM (Customer Relationship Management) and other technology-related strategies.

ASAP is a leading international author of business and technology reference books, with over 10 books published and sold in 36 countries, and has successfully completed over 2000 CRM implementations worldwide. We partner leading organisations, with leading brands such as FrontRange's GoldMine® and HEAT®, to offer the best choice of technology and support for our clients, with whom we aim to develop long-term relationships.

<p>CRM Requirements Scope Analysis Provides pre-sales consultancy, project scoping, workflow analysis and fully documented specification.</p>	<p>System Exploitation Fine tunes GoldMine system to improve performance and includes a system health check.</p>
<p>System Implementation and Data Migration Provides design, installation and configuration of GoldMine system and populates the data into the configured system.</p>	<p>System Reporting and Analytics Provides custom reporting solutions with Crystal Reports and helps you to utilise the existing GoldMine reports.</p>
<p>System Integration Offers integration to back-office systems, accounting and billing systems, quote generation, fax integration, CTI, web lead integration, service & support software, address management software etc.</p>	<p>System Training and Support Systems-based training that gives the skills needed to understand and use your GoldMine or HEAT system. Training can be delivered at different skill levels and targeted at specific people in an organisation. Our instructor-led workshops are practical and interactive and can be conducted on or off site, using real-life examples relevant to your business and the system you use.</p>

About FrontRange: FrontRange Solutions was founded in 1989 and has focused on the development of software and solutions, which allow organisations to deliver extraordinary customer service. They are recognised as leaders in the global mainstream CRM market with their award-winning GoldMine® and HEAT® brands.

For more information please contact us

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