



GWAVA Inc.

GWAVA® Retain™

For GroupWise®

Linux Install Guide

For version 2.0

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Intended Audience

This manual is intended for IT administrators in their use of Retain for GroupWise or anyone wanting to learn more about Retain for GroupWise. It includes installation instructions and feature descriptions.

Organization

The guide is organized into two sections, Overview and Installation. The Overview section covers all the basic information needed to plan where to implement and install the different parts of Retain in your System. The Installation section briefly goes over the necessary steps to install Retain.

General use and management of Retain is covered in the User's Guide, please read that guide for setup and configuration steps and information.

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IMPORTANT NOTES

Retain 2 Configuration Database

Retain 2.0 has changed the location of the Retain configuration database. In Retain 1.x the configuration database was located in an integrated Derby database. Retain 2.0 moves the configuration database to the current retain database housed on any supported SQL server. This database can be hosted locally, on the same SQL server as the current SQL Retain storage database, or on a separate server altogether. The configuration database must be accessible to the Retain Server on startup, so quick and reliable network connection is inherently important.

Since this database is where Retain stores all configuration data as well as mail, a non-local database may cause lower performance speeds for the Retain Server. Recommendations and administration for the storage SQL server, (dependable and fast network connection, backups, and customer management), have not changed.

Exalead

Retain now includes the option to install an extremely robust indexing engine for larger systems. Exalead can index massive amounts of data and is recommended for archiving systems with 1000 or more users. Because of Exalead's robust nature, more mail searching options will be available. It is highly recommended that Exalead be installed to a dedicated server, for best performance. If using Exalead, the system must be installed and running before the Retain Server is configured. For install and system requirements, please refer to the Exalead installation document.

Tomcat 5.5.27 Embedded With Retain

Retain ships with embedded Tomcat 5.5.27. Retain 2.0 requires you to install and use the embedded Retain-Tomcat. Installation on an existing Retain system running a standard Tomcat installation will remove the current Retain-Tomcat connection and install the embedded Tomcat that comes with Retain. Installation instructions are located in the install section.

Retain-Tomcat will not interfere with the standard installation and ports; they have been changed, as follows:

HTTP port:	48080
AJP port:	48009
Home Directory:	/opt/beginfinite/retain/tomcat
Log Directory:	/opt/beginfinite/retain/tomcat/logs
Start Script:	/etc/init.d/retain-tomcat5 start stop restart status
Configuration file:	/etc/opt/beginfinite/retain/tomcat/j2ee
Memory Tuning:	Defaults to initial memory of 256MB and max of 1024MB. (Memory should still be tuned.)

The Retain install script, RetainInstall.sh, detects whether the embedded Retain-Tomcat installation is present or not, and then prompts you to install the embedded Retain-Tomcat if it is missing.

The embedded Retain-Tomcat install shuts down and removes the Retain files from the standard Tomcat installation. Retain-Tomcat is then installed. The standard Tomcat installation will still automatically start on boot if it was set to do so, and the memory that was set aside for that service will still be unavailable to the new Retain-Tomcat installation. Because of the considerable memory resources that the standard Tomcat will consume, it is **STRONGLY** recommended that the memory tuning previously performed be removed, and if possible, the standard Tomcat installation completely removed via YaST, or disabled. It is also recommended that the Retain Server is run on its own dedicated machine.

To ensure compatibility and performance for Retain in the future, the embedded Retain-Tomcat will be the only supported method of running Retain. Due to these tweaks, Retain-Tomcat is not suitable to run any other web services and may be incompatible.

System Requirements

The hardest part about installing Retain is preparing GroupWise and your server(s). You must first decide *where* you want everything installed. Once the support and core components are installed, using Retain is the same no matter what platform it is installed on. You may spread out Retain's components on different servers or run them all on one.

Minimum System Requirements

- Pentium 4 (or higher) at least 3.0GHz
- 2 GB of Ram (for the Server) 64 MB of Ram (for the Worker)
- Apache 2.0x for SLES 9 and OES 1, Apache 2.2 for SLES 10, SLES 11, and OES 2
- MySQL 5.1x (or alternate supported database version)
- Sun Java 1.5 JDK 32-bit or 64-bit versions
- As much storage space as mail system requires. (see [Estimating storage requirements](#))

Suggested Requirements

- Dual-Core 3 GHz or better Processor
- 4 GB of system Ram or more installed
Consider allocating more memory for Retain, up to 8 GB or RAM on large scale systems. Initial install only allocates 1 GB. See [Tomcat Memory Tuning in Appendix B](#) for information to allocate more Tomcat memory.)
- 160 MB Ram free for Retain Worker

Supported Linux Versions:

- Open Enterprise Server 2 Linux (64-bit)
- SuSE Linux Enterprise Server 10 SP2 (64-bit)
- SuSE Linux Enterprise Server 11 64-bit.
- 32-bit versions are only supported for the worker. (RetainServer is not supported on 32-bit.)

Novell GroupWise Requirements:

- GroupWise 8, 7. (For GroupWise 7, Retain requires 7.03 or higher. 7.01 and above may function with Retain, but are no longer tested.)
- 7.0.3HP1 or later is recommended for bug fixes and performance improvements.
- SOAP port must be enabled on all POAs to be scanned for messages.
- SSL is supported, but significantly impacts performance.

Supported SQL Database Servers

- MySQL 5.0x
- MySQL 5.1x
- Oracle 10/11
- MS SQL Server 2005
- MS SQL Server 2008
- MS SQL Server 2008 R2
- PostgreSQL 8.2+
- PostgreSQL 8.4

Known Incompatibilities

The following are systems known to be incompatible with Retain for GroupWise. DO NOT USE THESE on the same server as Retain for GroupWise.

- **Apache 1.x** – Retain for GroupWise will NOT function with Apache 1.x
- **MySQL 4.x** – DO NOT USE THIS; it will cause data corruption. Use only MySQL 5.x and above.
- **iFolder 3.x** – iFolder 3.x and Retain for GroupWise must NOT be used on the same server. Disruption to the Retain Worker will result.
- **GroupWise WebAccess** – only incompatible if using Microsoft IIS for running Retain for GroupWise
- **Retain cannot access mailboxes with either of the following set**
 - Disabled/Expired account
 - The GroupWise SOAP API cannot log into these accounts and is subject to the same limitations as standard GroupWise clients.
 - Limited client license
 - Novell has addressed the limited client license issue in GroupWise 7 SP3.*

What Retain does

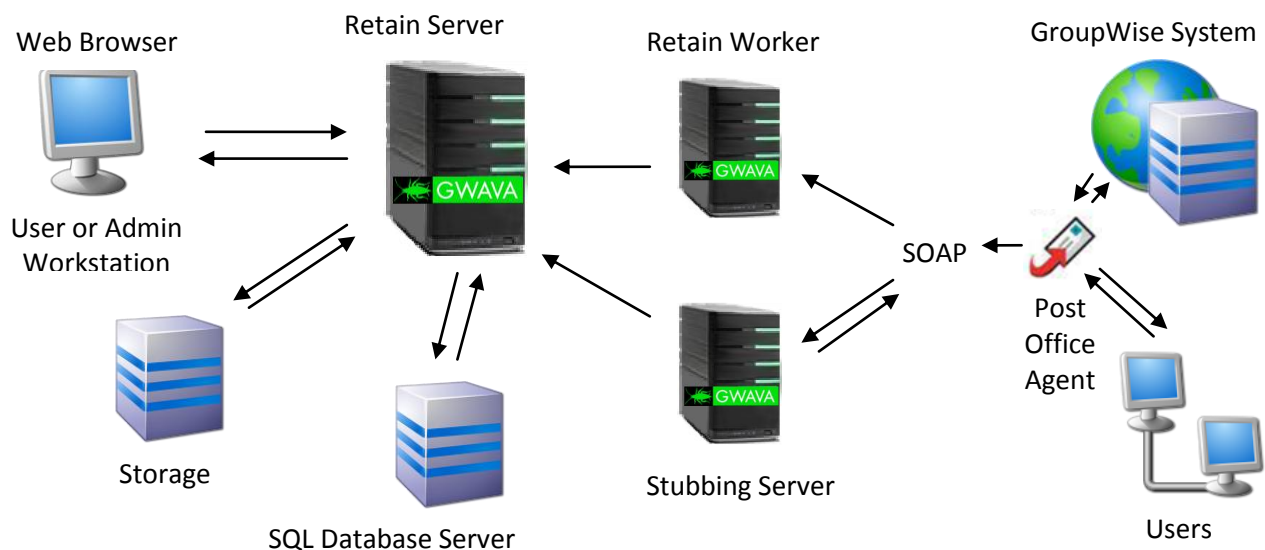
Retain provides a service of long-term storage of data as well as providing search, retrieval, and review services for retained messages. Retain is NOT a backup or emergency restoration system. (For this, we recommend GWAVA Reload.) Retain dredges messages from GroupWise post offices and stores them for long-term reference. Users may log in and review their personal archived mail and search through it.

How Retain works

The Retain Worker process uses *SOAP* and a trusted application key to collect GroupWise data on a schedule and criteria specified by the system administrator. This email data is transferred to the Retain Server which stores the collected data in a defined storage location and indexes the data in the SQL server. Users log in to the Retain Server's web interface to search through and access their archived messages. User rights are managed by the administrator.

Architecture

Retain for GroupWise consists of several main parts which can be installed on the same server or they can be spread out across different servers to allow flexibility in where data gets stored and which servers will be used to perform Retain for GroupWise's functions.



- **Retain Server:** This is the heart and soul of Retain for GroupWise itself. All functions are controlled from the Retain Server. The server also manages the Retain Worker and stores data in the database server. There is only one Retain Server per system.
- **Retain Worker:** There is at least one per system. The worker does the actual data collection work. The collected data is handed to the server. The server stores the data in a database.
- **SQL Database Server:** This is an SQL server where Retain for GroupWise stores the collected data. It is not actually part of Retain for GroupWise itself. Retain for GroupWise was designed to support many different databases.

Installation, maintenance, tuning, and backup of the database is the customer's responsibility.

- **Stubbing Server:** The stubbing server works to remove large messages from the GroupWise system and creates a 'stub', or link, to the message which is stored in the SQL database. See the Stubbing Server section in the Main Guide to decide if a stubbing server is correct for your system. From a User's point of view, there is no change to the behavior of their GroupWise mailbox.

Best Practices for Component Placement

Retain for GroupWise components communicate via TCP/IP. Though placing all the components in the same server would yield the best communication speed, such placement is impractical for larger systems. Thus, you must balance the performance of the components on the physical servers with the speed of the network links joining them. It is highly recommended to have the Retain Server separate from any workers. One worker may exist on the same physical machine as a server. More than one worker residing on the same physical server is not supported.

How Retain Stores the Archives

Retain for GroupWise uses a hybrid data storage approach. The database contains all the metadata, folder structure and attachment information but does not hold the actual message text or actual attachments. These are stored on the file system. Data is hashed using the SHA-256 algorithm which can be used to detect tampering.

Other components that Retain for GroupWise depends on

The following items must be ready before you install Retain for GroupWise's core components.

- Novell GroupWise
- Apache Web Server
- SQL Database for storage
- Sun 1.5 JDK (This is installed automatically in the installation script on systems with internet access. The JDK is recommended, as it provides additional troubleshooting options. **This is the ONLY supported version of Java.**)

Design Considerations

Retain for GroupWise is designed to be as flexible as possible, giving you choices as to where to install its components. Here are some points to keep in mind when deciding where to put everything.

SQL Database Server

- Where should the SQL database server be placed in the network? The faster the network connection the better. Local installation gives the best communication speed, but it's usually unrealistic to do so. In a large system, you might have the database on a server by itself for performance or security reasons. Then, network speed and reliability become key considerations.
- **The SQL server MUST NOT depend on an NFS share. NFS locking is not reliable enough for any database system and will result in database corruption. NFS shares should not be utilized in any database system.**

- Network link between the Retain Server and SQL Database Server must be speedy and reliable.
- **MUST SUPPORT UTF-8 character set**, and collation (MySQL 5.1x is an example of this).
- The Retain database will have to be manually created by the administrator, and a user account must be assigned with full rights. See the Database section. ([Appendix A](#))
- Storage requirements: Roughly equivalent to your cumulative POs, minus OFFILES and OFINDEX.
- **Backup, Clustering, Tuning is the customer's responsibility.** For specific instructions see your SQL Database Server manual. Tuning an SQL Database Server can make huge performance differences.

Retain Server

- CPU requirements are high. The bigger and faster the better.
- Storage requirements: Approximately the same as your GroupWise Post Offices, assuming you are archiving "everything". See Appendix C for more information.
- Backup and Clustering: Backup of indexes and internal database may be done automatically. Attachments can be safely backed up manually.
- We recommend other web applications such as GroupWise WebAccess or iManager NOT be installed on this same server.
- iFolder 3 must NEVER be installed on the same box as Retain Server.

Retain Worker

- The piece that actually grabs data on a scheduled basis from the POAs is the Retain Worker. It then passes this data to Retain Server.
- Requires a reliable, speedy network connection between Retain Server and Retain Worker.
- Requires a reliable, speedy network connection to Post Office Agents being accessed.
- To provide maximum network throughput, do not use SSL at the SOAP POA. The Worker then compresses the data and sends it to the Retain Server.
- DO NOT put iFolder 3 on a Retain Worker machine.
- To reiterate, it's recommended to put one Worker on the same box as the Server for communication performance reasons. (More than one Worker sharing the same physical box as the Server is unsupported.)

GroupWise Address Book

Retain for GroupWise gathers mail from known users. Users known to GroupWise are stored in GroupWise's **System Address Book**. Retain for GroupWise caches this information locally. Often, the address book needs to be updated as users are added. The Retain Server component NEVER deletes a user from the cached address book.

Over time, Retain for GroupWise will know about all GroupWise users on the system, both current and past. Because Retain for GroupWise stores past users in its cached address book, it can distinguish between two users of the same name. For example, "John Smith" will be recognized as a different user from "John Smith" who worked at the company six months ago.

GroupWise

- SOAP MUST be enabled at all Post Office Agents being contacted by Retain Worker.
- SSL must be universally on/off at all SOAP Ports. One or the other, but not a mixed state. We can always change from plaintext to SSL, but not the reverse downgrade. However, it costs in performance. SSL in general is VERY performance intensive. Therefore we recommend leaving SSL off.
- During the setup wizard, you'll need to generate a **Trusted Application Key** on a Win32 workstation with full rights to the primary domain. (This is in the General Admin guide)
- (optional) Retention and/or Smart Purge flags enabled.
- It's recommended that backup jobs by the Retain Worker occur at off hours, to avoid overloading the Post Office Agent.
- Address Book caching is recommended every 24 hours.

Retain-Tomcat

- Normally you can connect to the embedded Tomcat directly via port 48080. This is a good diagnostic to ensure that it is running. Make sure to allow a few minutes after the service is started before the system becomes available.
- **Retain-Tomcat memory usage must be fine tuned.** This cannot be stressed enough. Default values are insufficient for normal operation of Retain for GroupWise. See [tuning Tomcat section](#), below.

Retain Installation

SuSE Linux Enterprise Server 10, 11

Before running the Retain installer, you must first ensure that the following are installed and working:

- Apache 2
- SQL server with appropriate database created
- For installation targets without an internet connection, the latest Sun Java JDK 1.5 must be installed.

SLES 10 and 11 feature Apache 2.2x. In YaST, search for apache2; make sure Apache 2.2x is installed. Go to Network services, and activate HTTP SERVER to run on boot. **Java 1.42 is NOT SUPPORTED.** *The Retain install will automatically download and install the appropriate Sun JDK 1.5 if the server has a connection to the internet. If the server does not have an internet connection, you must install Sun JDK 1.5 manually.*

***** NOTE: BE SURE YOUR SERVER'S CLOCK IS ACCURATE BEFORE YOU BEGIN! USING NTP IS RECOMMENDED TO KEEP YOUR CLOCK ACCURATE.**

Once you've downloaded the Retain Installation package and unzipped it, the files in the working directory should look like this:

ALWAYS RUN THE INSTALLER.txt	tomcatinstall.sh
java.sh	<common>
license.txt	<doc>
readme.txt	<exalead>
RetainInstall.sh (Linux install script)	<linux>
RetainInstall.ips (NetWare install script)	<migrate>
RetainInstall.exe (Windows installer)	<NetWare>
RetainWorker.zip (core Retain Worker)	<precompile>
RetainServer.zip (core Retain Server)	<tools>
RetainStubServer.zip (core Retain Stub Server)	<win32>
Setup Tomcat for Windows.exe	<win64>

Install Procedure on Linux

- 1) (If the system is using MySQL, this step may be skipped as the installer contains a wizard.) On the SQL database server of your choice and create the retain storage/configuration database. See [SQL Servers](#) in the Appendix for instructions.
- 2) Unzip the install files to a work directory. (Your distribution directory) (Example: /root/retain)
- 3) Open a terminal session such as Gnome terminal.
- 4) Navigate to the directory where you unzipped the install files. (Example: cd /root/retain)
- 5) We now need to install Retain-Tomcat, and Retain. Enter the following commands:

chmod +x *.sh (This command flags the install scripts to be executable)

./tomcatinstall.sh (This command installs Retain-Tomcat and removes the Retain hooks from the standard Tomcat installation. It is recommended to disable the current Tomcat

installation; you will be instructed to do so at the conclusion of the tomcatinstall.sh script. Consider removing the old Tomcat installation via YaST.)

--Optional-- If you are not uninstalling a previous Tomcat version, the following command removes the previous Tomcat instance from running and allocating system resources.
chkconfig --del tomcat (chkconfig --del tomcat5 on SLES 10, 11) (Also see the [memory tuning section](#) to return the general Tomcat tuning back to normal.)

./RetainInstall.sh (This command initializes the Retain installation. Move on to step 6.)

6) Read and accept the license agreement.

7) The install will check your Java version. If you are not running Sun Java JDK 1.5.0.22, it will then be downloaded automatically. The installer will detect whether you are running 32-bit or 64-bit OS, and automatically download and install the correct version. (If you have run a 32-bit Java 1.5 version on a 64-bit server, the installer will not detect a mismatch. We strongly recommend you uninstall the 32-bit version and install 64-bit SUN Java in its place.)

8) The installer will prompt you to accept or deny the Java license agreement. Accept to continue.

9) After Java 1.5 has been installed, you will be prompted to specify the JAVA-HOME switch to the Sun JDK 1.5. If you have nothing specified, or another version, specify the correct version here. The syntax should show:

JAVA_HOME=/opt/beginfinite/retain/java/jdk1.5.0_22

(Java is now installed and the Retain installation continues)

10) Determine whether Retain Server, Retain Worker or both will be installed.

11) Determine whether or not to install the Stubbing Server. **To use stubbing, it is strongly recommended that the GroupWise system be at least 8.0 SP1. Previous versions of GroupWise do not contain critical stability fixes.**

--If you have a current Retain System installed and running, you will be prompted to upgrade or overwrite your current system.--

- Apache and Retain-Tomcat will be stopped
- Retain for GroupWise will be unzipped into /opt/beginfinite/retain.
- The data will be stored in /var/opt/beginfinite/retain by default.
- Backups of modified files go in /opt/beginfinite/retain/backup
- The Apache integration file is in /opt/beginfinite/retain/ws
- Apache and Tomcat are made to restart and their runlevels are altered to run automatically on system start.

12) Specify SQL database server. If MySQL, the install will run through an automated creation of the required Retain database. The administrator name, password, database, database name, and access user will be created. If a root or admin user already exists, enter the correct information when asked. MySQL must be running and accessible for the automated database creation to work. Please see the quick start guide for manual instructions.

13) If you installed Retain Server on this machine, you will be asked if you wish to Pre-compile the JSPs. Pre-compiling JSPs can vastly improve the user interface performance and is recommended for a better experience. It may take several minutes to complete. Pre-compiling JSPs will fail, (with "cannot find compiler" message), if you have not set up JAVA_HOME correctly in the installation step 9.

14) Reboot.

15) In a terminal window, check the status of **apache 2** and Retain Tomcat. They should both be "running":

rcapache2 status

/etc/init.d/retain-tomcat status

16) You are now ready to continue on to the configuration tasks. See the General Admin guide.

Custom Storage Path Rights

During the configuration, you choose a storage path for the archived mail. Retain requires read and write access and permissions to the storage path. If you are specifying a storage path other than the default (/var/opt/beginfinite/retain) then you need to grant rights and ownership to Retain.

After running ./RetainInstall.sh, find out which user Retain is using to access the file system. (For SLES 10.1, 10.2, 11 the user is called 'tomcat').

In a console, type:

l /opt/beginfinite/retain

```
vm-sles10-retain:~ # l /opt/beginfinite/retain
total 1
drwxrwxr--  6 tomcat www  160 Mar  7 13:03 ./
drwxr-xr-x  3 root   root  72 Mar  7 13:03 ../
drwxr-xr-x 14 tomcat www  528 Mar  7 12:58 RetainServer/
drwxr-xr-x  7 tomcat www  416 Mar  7 12:58 RetainWorker/
drwxrwxr--  3 tomcat www   72 Mar  7 13:03 backup/
drwxrwxr--  2 tomcat www   88 Mar  7 13:03 ws/
vm-sles10-retain:~ #
```

This shows the User and the group that own the directory structure. In the system shown, Retain is using Tomcat as the user.

Create the directory structure for the desired storage location, and then grant the permissions and ownership to the Retain user.

(mkdir <desired directory structure>)

(chown -R <user> <storage directory>)

(chmod -R 744 <storage directory>)

(In this example, we have already mounted our SAN or physical drive to the /retain directory and wish to store mail in the /retain/archives directory.)

mkdir /retain/archives

chown -R tomcat /retain/archives

chmod -R 744 /retain/archives

```
vm-sles10-retain:/retain # mkdir /retain/archives
vm-sles10-retain:/retain # chown -R tomcat /retain/archives
vm-sles10-retain:/retain # chmod -R 744 /retain/archives
```

Now check the directories for ownership.

l /retain

```
vm-sles10-retain:/retain # l /retain
total 1
drwxr--r--  3 tomcat root   72 Mar  7 16:06 ./
drwxr-xr-x 25 root   root  608 Mar  7 16:01 ../
drwxr--r--  2 tomcat root   48 Mar  7 16:06 archives/
vm-sles10-retain:/retain #
```

Tomcat now has rights to the storage location.

Appendix A

SQL Servers

The SQL start guides are included here as a courtesy. It is your responsibility to find the proper installation procedures and documentation from your chosen database vendor. ***The entire responsibility for installation, care, and maintenance of the database server lies with the customer. We do not provide any kind of support for the database server.***

WARNING: NFS shares should not be utilized in any database system. NFS locking is insufficient for database requirements and will result in corruption.

MySQL – WARNING: MySQL 4.x is provided with this version and it is installable via YaST. Do NOT use it; it is NOT compatible with Retain for GroupWise and will corrupt your data if used. Uninstall MySQL 4, and get MySQL 5.1x MySQL 5.1 needs to be downloaded and installed.

MySQL Quick Start Guide

This guide is provided purely as a courtesy and will detail a very basic installation and database creation for Retain. This guide is provided with **no warranty and no MySQL support** offered.

***** WARNING: OES 1.0/SLES 9 come with MySQL 4.x installations. DO NOT use these!** Retain for GroupWise is not compatible with their storage format. Irreparable corruption and loss of data is almost guaranteed. GWAVA inc. and GWAVA Retain assumes no responsibility for running Retain for GroupWise against MySQL 4.x!

To use MySQL with Retain for GroupWise, you will need to do the following:

- 1) Download MySQL
- 2) Install it to the server of your choice.
- 3) Log in and create a database for Retain for GroupWise to use.
- 4) Create a user with rights for Retain for GroupWise
- 5) Retain for GroupWise will do all the rest.

Getting MySQL

Although SLES 9, 10, and 11 come with MySQL 5.x as an optional package to be installed by YAST, the version supplied by Novell is out of date and prone to data corruption. It is STRONGLY recommended you download and install the latest RPMs from MySQL. For MySQL to be useful, three packages need to be installed: the Server, Client, and shared client libraries.

- Go to <http://www.mysql.com>
- Get MySQL 5.1.x

Get the binaries appropriate for your system. Again, the Server package alone will not create a full working system; the Client and shared Client Libraries are required.

NOTE: 5.1x is the currently tested and supported version of MySQL, other versions may work, but are not supported by Retain.

MySQL Optimization

MySQL requires careful memory tuning. By default it assumes it is running on a 64 MB Server. In fact, you should give at least 1 GB RAM to MySQL. Larger sites may well allocate 2, 4, 16, or even 64 GBs of RAM depending on their data store. We do not support or discuss memory tuning requirements. However the following links may help (Retain uses InnoDB tables):

<http://www.mysqlperformanceblog.com/files/presentations/UC2007-Innodb-Performance-Optimization.pdf> covers InnoDB specifically. Clear and concise; the "bible" for optimization:

<http://www.mysqlperformanceblog.com/files/presentations/UC2007-MySQL-Server-Settings-Tuning.pdf>

Also, for basic optimization directly after MySQL installation, see:

<http://www.mysqlperformanceblog.com/2006/09/29/what-to-tune-in-mysql-server-after-installation/>

MySQL 5.1x Installation Procedure on Linux

Applies to: SLES 9/OES Linux 1.0/SLES 10/SLES 11

- 1) Log in as root
- 2) Get MySQL 5.1x
- 3) Open a command-line terminal (like a DOS box in Windows)
- 4) Go to the directory where the RPM is.
- 5) For each rpm you downloaded, type
`rpm -ihv <rpmfilename>.rpm`
- 6) Create a directory where you want your data stored.
- 7) Type
`mysql_install_db --datadir=<datadirectory>`
- 8) Start MySQL:

MySQL is a standard Linux service, with a script stored in /etc/init.d. It is configured to run automatically on restart.

The Retain 2 installer on Linux has automated the remaining steps of MySQL configuration. The following steps remain here as a courtesy for those who wish to manually create and add privileges to a database. No further configuration is needed if you are using the automated database creation provided in the installer.

9) From the command line, type
`/etc/init.d/mysql <command> --datadir=<datadirectory>` where available commands are stop, start, and restart, as appropriate.

10) Create a password type:

```
mysqladmin -u root password '<yourrootpassword>'
```

11) Log in to MySQL by typing:

```
mysql --user=root --password=<yourrootpassword>
```

12) You are now ready to create the database. See below.

***** You may proceed exactly as the SLES 9 instructions instruct after the client and server are installed. One minor difference is that MySQL is not set to run on restart with SLES 10, and 11. Change this with the run level Editor in YAST.**

Create a new database for Retain MySQL

Applies to: All platforms

1) Log in to MySQL, as in the last step of the installation procedures.

2) Enter the command:

```
CREATE DATABASE retain DEFAULT CHARACTER SET 'utf8' DEFAULT COLLATE 'utf8_general_ci';
```

***** This is critical. Not storing the database in UTF-8 format guarantees irreparable corruption for non US-ASCII characters. *****

3) If you make a mistake, enter this command:

```
DROP DATABASE retain;
```

...and repeat step 2.

Create a user for Retain for GroupWise and grant rights.

It is poor security practice to use the root account for ordinary database access. Retain for GroupWise needs a user account created that has full rights to the retain database. The example below will use mjb as the username and the password will be turnip. You may substitute these values for the user name and password you desire.

1) While logged in to MySQL, enter the following commands:

```
GRANT ALL PRIVILEGES ON retain.* TO 'mjb'@'%' IDENTIFIED BY 'turnip';  
GRANT ALL PRIVILEGES ON retain.* TO 'mjb'@'localhost' IDENTIFIED BY 'turnip';
```

(Both commands are needed. The '%' is a wildcard. If you want to restrict the connection to a specific ip address, put that address instead.)

Further tuning

You need to know:

- MySQL server IP Address/HostName
- data port
- database username
- database password

It is your responsibility to learn more about your SQL Database Server. Tuning these for performance often requires an experienced DBA. It is your responsibility to backup the database store, and make it fault tolerant.

Schema update note: On Linux, some systems have encountered an error after a schema update caused when MySQL cannot create a temporary file for the result of a Retain query.
The following appears in the RetainServer log:

```
2008-10-27 00:00:59,786 [TP-Processor2] ERROR com.maintainet.dao.HibernateUtil -  
SCHEMA UPDATE FAILURE: Something went wrong during Schema Update - contact tech  
support immediately  
2008-10-27 00:00:59,786 [TP-Processor2] ERROR com.gwava.utils.ErrorHandle -  
reportError: SchemaUpdate :: EXCEPTION :  
org.hibernate.exception.GenericJDBCException: could not get table metadata: Audit  
org.hibernate.exception.GenericJDBCException: could not get table metadata: Audit
```

This is usually caused when MySQL cannot create or has lost rights to the tmp working directory. Try the following from a system terminal:

1. `mkdir /var/lib/mysql/tmp`
2. `chown mysql:mysql /var/lib/mysql/tmp`
3. add the following line into the [mysqld] section of /etc/my.cnf: `tmpdir = /var/lib/mysql/tmp`
4. Restart the Server

SQL Server 2008

1. Install as default instance, with Latin 1 as standard encoding.
2. Enable SQL Server Authentication in addition to Windows Authentication
3. Once installed, Verify server is listening on port 1433 (telnet ip address 1433)
5. Ensure TCP/IP is enabled - Run SQL Server Configuration Manager
6. Expand SQL Server Network Configuration
7. Protocols for MSSQLSERVER
8. Enable TCP/IP
9. Run SQL Server Management Studio, connect to Server
10. Under Security/Logins, right click and select "create Login, (for example retainuser) that uses SQL Server authentication. Assign a password.
11. Right click on Databases, and create a new database named retain and assign retainuser as the owner. (There are other ways to grant the permissions but this is easiest)

SQL Server 2005 (SP1+ required)

1. Install as default instance, with Latin 1 as standard encoding.
2. Enable SQL Server Authentication in addition to Windows Authentication
3. Verify server is listening on port 1433 (telnet ip address 1433)
4. Run SQL Server Management Studio, connect to Server
5. Under Security/Logins, right click and create a new user, (for example retainuser) that uses SQL Server authentication. Assign a password.
6. Right click on Databases, and create a new database named retain and assign retainuser as the owner. (There are other ways to grant the permissions but this is easiest)

ORACLE 10/11

We support the usage of Oracle 10 and 11 on all platforms. However, **we do not support the installation or tuning of Oracle** for this purpose.

The instructions below serve as a guideline, but may result in poorly performing, insecure environments,

Oracle Installation instructions vary wildly depending the version, OS, storage, clustering, etc. so consult your DBA. There is no one-size-fits-all. This is also true of other SQL Server products, but Oracle even more so.

Using Oracle with Retain consists of

- Installation of the Oracle Server
- setting up a TCP IP listener
- Setting up a new database named retain
- creating a user to access the database, and granting sufficient rights.

Installation

Install your Oracle Server normally, according to your standards and practices. One option is to use the Universal Installer, specifying a custom installation, choose the type of Oracle Server to install, and to Install Files Only

TCPIP Listener

Next use the Net Configuration Assistant (or manually edit the Oracle Listener configuration) to create a TCP based listener on port 1521. This allows TCPIP clients to connect to Oracle and is required for Retain.

Database Creation

Next, either use the Database Configuration Assistant or manually create the database with your favorite tool.

Regardless, you want to create a database and sid, named retain, and create your SYSTEM account

An example of a create statement (which should *not* be used as is)

```
connect "SYS"/"&&sysPassword" as SYSDBA
set echo on
spool C:\oracle\product\10.2.0\admin\retain\scripts\CreateDB.log
startup nomount pfile="C:\oracle\product\10.2.0\admin\retain\scripts\init.ora";
CREATE DATABASE "retain"
MAXINSTANCES 8
MAXLOGHISTORY 1
```

```

MAXLOGFILES 16
MAXLOGMEMBERS 3
MAXDATAFILES 100
DATAFILE 'C:\oracle\product\10.2.0\oradata\retain\system01.dbf' SIZE 300M REUSE AUTOEXTEND ON
NEXT 10240K MAXSIZE UNLIMITED
EXTENT MANAGEMENT LOCAL
SYSAUX DATAFILE 'C:\oracle\product\10.2.0\oradata\retain\sysaux01.dbf' SIZE 120M REUSE
AUTOEXTEND ON NEXT 10240K MAXSIZE UNLIMITED
SMALLFILE DEFAULT TEMPORARY TABLESPACE TEMP TEMPFILE
'C:\oracle\product\10.2.0\oradata\retain\temp01.dbf' SIZE 20M REUSE AUTOEXTEND ON NEXT 640K
MAXSIZE UNLIMITED
SMALLFILE UNDO TABLESPACE "UNDOTBS1" DATAFILE
'C:\oracle\product\10.2.0\oradata\retain\undotbs01.dbf' SIZE 200M REUSE AUTOEXTEND ON NEXT
5120K MAXSIZE UNLIMITED
CHARACTER SET AL32UTF8
NATIONAL CHARACTER SET AL16UTF16
LOGFILE GROUP 1 ('C:\oracle\product\10.2.0\oradata\retain\redo01.log') SIZE 51200K,
GROUP 2 ('C:\oracle\product\10.2.0\oradata\retain\redo02.log') SIZE 51200K,
GROUP 3 ('C:\oracle\product\10.2.0\oradata\retain\redo03.log') SIZE 51200K
USER SYS IDENTIFIED BY "&&sysPassword" USER SYSTEM IDENTIFIED BY "&&systemPassword";
spool off

```

The most critical items to note are the CHARACTER SET (AL32UTF8 aka UTF8), and the NATIONAL CHARACTER SET (AL16UTF16). If using a GUI based installed, be careful to set these - they are easily missed. (They are located on the Encoding tab of the 10th step or so of the wizard).

User Account Creation

Finally, using the SYSTEM account, connect to the database, create a user, and grant full system privileges to the account.

An example is shown below:

```

CREATE USER user-name IDENTIFIED BY password;
grant dba to user-name;

```

Restart everything, and verify you can telnet on the TCP LISTENER's PORT (1521 if as above).

Tuning

Tuning Oracle is quite far beyond the scope of this manual. The manuals on Oracle's site, as well as several days of training are strongly recommended.

PostgreSQL 8.2-8.4

When creating a PostgreSQL database for use by Retain, specify UTF8 encoding. If the Retain Server is on a different machine, you will need to configure PostgreSQL to accept connections from that machine's IP address.

1. Connect to PostgreSQL using its psql utility.
2. Create a new user for use by Retain. In the example below, we are creating a user named "retainuser" with a password of "retainpassword":

```
CREATE ROLE retainuser LOGIN ENCRYPTED PASSWORD 'retainpassword';
```

The psql utility should respond with "CREATE ROLE."

3. Create a new database for use by Retain. Assign the user created in the previous step as the owner:

```
CREATE DATABASE retain WITH ENCODING='UTF8' OWNER=retainuser;
```

The psql utility should respond with "CREATE DATABASE."

4. If Retain Server is running on a different machine, you'll need to configure PostgreSQL to permit access:

a. By default, PostgreSQL only permits local "loopback" connections. To allow connections from other machines, add the following to the `postgresql.conf` configuration file:

```
listen_addresses='*'
```

b. Specify the user and IP address that is permitted to connect to PostgreSQL by editing the `pg_hba.conf` configuration file. The following example grants the user "retainuser" access to the database "retain" from IP address "192.168.2.2":

```
# TYPE      DATABASE   USER        CIDR-ADDRESS  METHOD
# IPv4 local connections:
host        retain     retainuser  192.168.2.2/32  md5
```

- c. Restart PostgreSQL to activate these changes.

Appendix B

Tomcat Memory Tuning

General Recommendations

The following are our general recommendations for the maximum memory allocation parameter. The initial memory allocation parameter may be anywhere from 50%-100% of these values. These parameters are discussed in more detail in the next section.

Retain Server Component

A minimum of 1 GB of RAM is recommended. For larger systems, 2-16 GB RAM may be fully warranted. Remember, if this RAM is in use by Tomcat, it is unavailable to other server processes – leave sufficient physical RAM for these. Of course, these other server processes are ideally minimal. Also, remember this memory is shared with other web applications.

Retain Worker Component(s)

The Retain Worker component(s) have been designed to be light weight. Nonetheless, a minimum of 64MB RAM is recommended, and 160MB is strongly recommended, to give room for future functionality. Remember, if this RAM is in use by Tomcat, it is unavailable to other server processes – leave sufficient physical RAM for these. Also, remember this memory is shared with other web applications.

Tomcat Configuration Parameters

There are three significant parameters:

1) Memory allocated upon Tomcat startup

- Indicates how much memory is immediately allocated and reserved to Tomcat upon startup. This memory will be in usage for the entire lifetime of Tomcat and never available to the other server processes.
- Typically this is set to 50%-100% of the maximum memory parameter discussed below. It can be lower, but pre-allocating a sizeable percentage of memory **enhances performance** and reduces memory fragmentation.

2) Maximum Memory available to Tomcat

- If the memory usage grows beyond the startup allocation, Tomcat will allocate additional blocks of memory in chunks as needed up to this limit. It will never return this memory to the general server memory pool. (Although memory internally will be freed and reused for Tomcat applications).
- Tomcat guarantees that it will never exceed this memory allocation parameter. If Tomcat runs out of memory, it will try to reclaim unused memory via garbage collection. If this is insufficient, the web application will be denied the memory allocation. Unpredictable (but invariably unpleasant) results will then occur.
- **This is the most critical parameter to tune.**

3) Stack Size

- For each thread (which includes each and every concurrent user request), Tomcat will allocate stack space.
- This value is typically measured in KB, and defaults to 512KB.
- It is allocated per concurrent users, and is in fact far too generous a number in general. 1000 users for example would take 500 MB of RAM just for stack space, before the program even allocates memory to run!
- Generally we recommend reducing this number to 160k. Increase conservatively, in 64 KB chunks, if you see out-of-stack-space errors in the logs.

NOTE: 32-bit Linux can allocate a maximum of 3 GB of memory for Java and Tomcat.

Retain should be tuned to use between 2 GB to 16GB of memory.

For the embedded Tomcat (5.5.27), which ships with Retain, Edit the following configuration file:
/etc/opt/beginfinite/retain/tomcat/j2ee

Retain-Tomcat is pre-tuned to use 256 MB initial memory, with a max of 1024 MB. This will not be enough for the server.

Edit the following line with the appropriate parameters for your system:

CATALINA_OPTS="-Xms256m -Xmx1024m -Xss160k"

This line sets the initial memory pool at 256MB, the maximum at 1024MB, and the stack size at 160KB.

By default, the embedded Retain-Tomcat is pre-tuned for basic functions, with 1024MB as the default for the RetainServer, and 256MB for the RetainWorker. **THIS WILL NOT BE ENOUGH IN A FULL PRODUCTION ENVIRONMENT.** Please tune to fit your system needs.

Checking memory:

After logging into Retain Server, click the bug icon at the upper left. Among other stats, you'll see the tomcat Memory statistics. These are for all web apps, not just Retain Server.

UPGRADED SYSTEMS

*If you upgraded, it is **STRONGLY** recommended to revert any previous memory tuning back to normal for the original Tomcat while using the embedded Retain-Tomcat that comes with Retain. If you are not using the standard Tomcat for any other web resource, simply uninstall, or completely disable, the standard Tomcat installation.*

Every OS has a different methodology! Please read carefully.

To return memory tuning to default revert the edits you created or restore a backup configuration file, (if you created one). If not, default memory settings are explained below.

SLES 9:

- 1) Edit `/usr/share/tomcat/catalina.sh`.
- 2) Find a line right below the `#!/bin/sh`, it may look similar to this, depending on what you set for your memory values:

```
CATALINA_OPTS="-Xms512m -Xmx1024m -Xss160k"
```

Change it back to the original setting:

```
CATALINA_OPTS=""
```

OES Linux:

If you are using the OES Tomcat4 instance (default)

- 1) Edit `/etc/opt/novell/tomcat4/tomcat4.conf`.
- 2) Edit `JAVA_OPTS`, (The default may have contained some settings already). Your line may look similar depending on your settings.
- 3) `JAVA_OPTS="-Xms512m -Xmx1024m -Xss160k"`

***** A typical OES Linux server uses lots of web services; you may keep some memory tuning to maintain the other web services performance.**

Change it back to the default or original setting.

```
JAVA_OPTS="-Xmx256M -Xss512k"
```

If you are using the SLES Tomcat5 instance, apply the SLES 9 instructions.

SLES 10,11:

- 1) Edit `/etc/sysconfig/j2ee`
- 2) Find and change the `CATALINA_OPTS` line back to the original setting: (Your line may look different depending on the memory values you set.).
- 3) `CATALINA_OPTS="-Xms512m -Xmx1024m -Xss160k"`

Change it back to the original setting:

```
CATALINA_OPTS=""
```

Appendix C

Estimating Storage Requirements

How much storage space you will need in your Retain for GroupWise system is dependent on many factors. While there is no hard-and-fast rule, we have provided the following guide to help you evaluate your own needs. If you have GWAVA Redline, you could use its reports to help you with your estimates. In all cases, you are making an estimate for how much disk space to provide to Retain for GroupWise. When rounding your figures, round up to provide more disk space than you estimate you need.

Calculation guide: Use the table below to help you calculate your storage requirements for Retain for GroupWise. Do this for each post office you plan to store in Retain for GroupWise and add up the results to get a final figure.

1. Get the disk space used by the post office, usually measurable in Gigabytes (GB). If you use GroupWise Document Management and its data is stored within the post office, run a library report using **GWCHECK** and subtract these values. Alternately, get the size of your post office directory and subtract the size of the DMS directory within it.
2. Estimate how much your post offices will grow in size over the upcoming years. There are many ways to estimate this. See below for suggestions. Remember that Retain for GroupWise is cumulative.
3. Decide how long you want to keep your data (retention time) in years.
4. Calculate your disk space requirements by multiplying your estimated growth per year by the number of years and adding the current size of your post office.

Parameter	Answer	Value #
Post Office Space Used (GB): (not including document management)		1
Yearly Additional Disk Space (GB): (estimate)		2
How long will you keep your data (Years)		3
Disk Space Requirements (GB): Calculate: [value 2] x [value 3] + [value 1]		4
Add 35% for indexes to get a Grand Total (GB) Calculate [value 4] x 1.35		5

Remember, this is only an ESTIMATE, assuming you will be storing EVERYTHING. As you restrict what you will actually store, this figure will go down. For example, do you want to store 50MB attachments? It is your choice.

Suggestions on methods to estimate your post office growth per year

Post office growth varies wildly from company to company and even from post office to post office. There is no hard-and-fast rule which works for everybody. However, some historical data from your own company can help you make a reasonable estimate to determine your ongoing disk space requirements. It is very strongly recommended that the file system you use to store your Retain for GroupWise data be either LVM, NSS or some other system which will allow you to simply add to the storage pool as your needs dictate. Retain for GroupWise tends to need less disk space than your GroupWise post office. It's a small amount less but a conservative estimate would be to simply say "the same amount". Naturally, this only applies if you are storing "everything". Not every organization will store "everything". If, for instance, you're only storing data for certain specific users, you can run GWCheck to determine approximately how much of the post office is used by their data. Redline has a report on post office usage which will tell you right away how much space these users are taking. Take this figure as your baseline "post office size today". Everything else will be calculated based on this figure. $\text{Current Size} = \text{Past Size} + \text{Additions} - \text{Deletions}$ Retain for GroupWise Needs = Past Size + Additions so the real challenge is making a reasonable estimate of what was or will be deleted. Calculate these figures for each post office you plan to store in your Retain for GroupWise archive and add the results together to get a final total. Suggested Method

- 1) Take your post office size today. (Present Size)
- 2) Take the size of the post office at some point in the past – as close to a year as you can get. (Past Size)
- 3) Calculate the size difference between them (Size Increase) and the time difference (Time Difference)
- 4) Extrapolate the size difference over the year. You'll get an estimate of NET growth. (Mail was deleted too).
- 5) Estimate how much mail was deleted from the system. This will be a wild guess at best but only you can make such an estimate.
- 6) Your annual growth will be Net Growth + Deletions.

Even if you can measure your actual growth from last year to this year, it is a NET growth. In addition, rates of growth tend to go up as bandwidth increases because people are simply sending larger and larger items. Some people store things in GroupWise like it was a filing cabinet. So it's a good idea to overestimate your needs and plan accordingly.

Appendix D

Uninstalling Retain for GroupWise

Should you wish to uninstall Retain for GroupWise, use the following general procedure. Actual steps will vary according to your host Operating System.

1. Shut Down Tomcat
2. Shut Down Apache
3. Remove the data storage path (delete the files)
 - a. Can be: sys:retain, \retain, /var/opt/beginfinite/retain ... etc.
 - b. See the Retain Administration Guide section on storage to see where your data actually is placed.
4. Remove the program files
 - a. Can be: on Linux /opt/beginfinite/retain, on other platforms, stored under storage path
5. Remove the RetainWorker.xml and RetainServer.xml from Tomcat.
 - a. Linux Tomcat5 `/usr/share/tomcat5/conf/Catalina/localhost`
6. Remove the directories under tomcat/work (but NOT work itself)
 - a. Linux: `rm -r /usr/share/tomcat5/work`
7. Remove references to Retain for GroupWise in httpd.conf
 - a. Can be: /etc/apache2, sys:\apache2/conf, or <InstallPath>\conf).
8. (optional) remove MySQL, Apache, Tomcat
9. If Apache and Tomcat were not removed, restart them both to verify that they load without problems.

Appendix E

Single Sign On WebAccess Remote Install, or Manual Install for NetWare

Netware does not satisfy the requirements to successfully run the WebAccess Single Sign On module for Retain. To install manually, see the instructions found at the following link:

<http://support2.gwava.com/kb/?View=entry&EntryID=1608>