Volume 1

Hyperwave Installation Guide

Hyperwave Information Server

Version 4.1

HYPERWAVE
Organize your future

Hyperwave Installation Guide

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1 INSTALLING HYPERWAVE INFORMATION SERVER FOR WINDOWS NT

This chapter describes the steps necessary to install or upgrade the Hyperwave Information Server for Windows NT, including where to get the software, system requirements and server registration.

1.1 GETTING THE SERVER LICENSE

BEFORE YOU HAVE A LICENSE

The software package contains a fully functional copy of Hyperwave Information Server. However, it does not contain a license to evaluate or permanently use the product in a network. With the package, you will be able to install the server software, start it and access the server with a browser installed locally on the computer where the server software is installed. Only 3 user sessions are allowed, and 2000 documents can be uploaded to the server.

GETTING AN EVALUATION OR COMMERCIAL LICENSE

An evaluation license for Hyperwave Information Server for a 30-day trial period with network access and a limitation to 5 concurrent user sessions and 2000 documents is available by registering at `http://www.hyperwave.com/download/license`. If you need any extensions to the license for testing purposes, e.g. more users, more documents, etc., or, if you would like to purchase the product, please contact our sales team at `sales@hyperwave.com`.

INSTALLING THE LICENSE FILE

As soon as your registration is accepted you will get a new server license file for your site. This new license file will be sent to you as email. Take the part of the email from

```
----BEGIN HYPERWAVE LICENSE-----
```

to

```
----END HYPERWAVE LICENSE-----
```

and put it in a text file called `.server_license` (note the "s" in license) and put it in the home directory of `hwsystem`. Both the beginning and ending string above must be part of the file.

Note: Do not change the contents of this file! It contains a checksum that must fit the contents or Hyperwave Information Server will not start.

HOW LONG IS MY LICENSE VALID?

If you register Hyperwave Information Server and get a customer (not evaluation) license for the software, this license is good for all update versions of an entire major release. This means, for example, that if you have a license for Hyperwave Information Server 4.0, it is also good for all other 4.x versions.

KEEPING A BACKUP COPY OF YOUR LICENSE

It is a good idea to keep a backup copy of any license you receive, in case there are problems with a new license. As soon as there is no valid license file you will not be able to work with the server.

The IP address of your host (or hosts) is part of the license. If you intend to move the server to a different host you have to change your registration. Please apply for the changed license in advance by contacting `support@hyperwave.com`.

If you get a limited license for a certain time period (e.g. 1 year), please remember to apply for a new license well before the date your license expires, which is given as `TimeExpire` in the license text.

1.2 SYSTEM REQUIREMENTS

This section gives a detailed description of the system requirements for running Hyperwave Information Server under Windows NT. Although the requirements described here are not thought to be the absolute minimum configuration, it is highly recommended to operate the server on a system that is not too far below these requirements in order to get acceptable performance.

1.2.1 FACTORS WHEN DETERMINING SYSTEM REQUIREMENTS

System requirements for operating Hyperwave Information Server depend on the amount of documents you intend to serve, on the number of simultaneous users and on the dynamics of the data sets. This section shows you how to calculate an estimate of the amount of hard disk space and memory required to run your server. However, example configurations are presented first so you can get a general idea about what you need to run your server.

1.2.2 EXAMPLE CONFIGURATIONS

In this section you will find example configurations for small, medium and large sites that should help you choose the configuration appropriate for your application. Keep in mind that the calculations in this section and example configurations below are calculated for high performance. You can also try a smaller and less expensive configuration which should also work fairly well, but you may not get the best out of your server.

SMALL SITES In this context a *small* site is considered to store up to 2,000 documents and serve an average of 15 simultaneous sessions.

Such a site can be operated on a fairly small Intel PC, for example, a Pentium with 64 MB RAM. The documents and the server software require about 100 MB of disk space. Because peak load can be much more than 15 sessions, it might be necessary to install more memory depending on the environment in which the server is operated.

The configuration described here should be adequate to operate Hyperwave Information Server for evaluation purposes.

MEDIUM SITES A *medium* site is considered to be a server with up to 15,000 documents and an average of 50 simultaneous user sessions, with roughly 500,000 user requests per month.

In this case we would recommend a Pentium Pro or faster with at least 128 MB RAM and a fast SCSI hard disk interface.

Hyperwave Information Server is designed to guarantee consistency of the database even after a sudden power loss in the middle of a write access. This implies some additional synchronization. If you are planning to use Hyperwave Information Server for cooperative work or as a documentation server, the number of write accesses will be fairly high. In this case make sure that fast disks are installed.

LARGE SITES Defining what a "large" site is is a bit difficult. "Large" could mean a large number of documents, a high number of simultaneous users, an extremely dynamic data set or a combination of these.

One example of a large site is an electronic library server running in Graz which contains over 800,000 documents. Due to indexing of new journals a lot of write accesses take place. It is run on a DEC Alpha with 256 MB RAM.

To run a similar server on the NT platform, we would recommend using a multiple processor NT machine, e.g. 2 or 3 Pentium Pros with 256 MB of RAM or more and a disk array (RAID) SCSI hard disk interface.

1.2.3 DISK SPACE REQUIREMENTS

Disk space consumed by Hyperwave Information Server is made up of several parts: the server software itself, the data kept on the server, the amount of space consumed by the log files for internal and statistical purposes and space required for reorganization.

SPACE CONSUMED BY DOCUMENTS KEPT ON THE SERVER

Though the server itself takes up a certain amount of space, the most significant factor in determining space requirements is the amount of documents, object records and hyperlinks that you intend to keep on the server. The amount of disk space needed can be estimated using the following simple rules:

Text: Double the space for text documents (required for the full text index), and add an extra 300 bytes per document for meta-information. Hyperlinks are counted separately (see below).

Multimedia: Add an extra 300 bytes per document for meta-information. Again hyperlinks are counted separately.

Hyperlinks: Independent of the document type, hyperlinks need approximately 500 bytes each for meta-information.

As an example consider a fairly large server with 50,000 HTML documents, 10,000 images and 2,000 other multimedia documents such as video, sound and 3D scenes. In this example, inline images used in HTML documents are included in the 10,000 images.

Let us further assume that HTML documents have an average size of 3 kB and contain an average of 10 hyperlinks per document including inline links. Images have an average size of 30 kB each and 3 hyperlinks per image. Multimedia documents such as video, sound and 3D scenes have an average size of 150 kB and 2 hyperlinks per document.

This adds up to:

	Documents	Meta-Info	Hyperlinks	Total
HTML	50,000×2×3 kB	50,000×0.3 kB	50,000×10×0.5 kB	565 MB
Images	10,000×30 kB	10,000×0.3 kB	10,000×3×0.5 kB	318 MB
Multimedia	2,000×150 kB	2,000×0.3 kB	2,000×2×0.5 kB	303 MB
Total				1186 MB

Table 1: Disk space requirements for a fairly big Hyperwave Information Server

SPACE REQUIRED BY THE SERVER SOFTWARE

The actual software of the Windows NT Hyperwave Information Server and tools, including the demo data set, takes up 80 MB of space.

SPACE CONSUMED BY LOG FILES

Space consumed by log files depends on the load on the server and on the dynamics of the data. It also depends on the amount of time log files are kept on disk before moving them, to archival storage. There is no reliable rule of thumb for calculating the amount of space needed. Here is an example instead: the IICM Hyperwave Information Server with over 200,000 documents and an average of over 700,000 monthly http requests produces an average of 250 MB of log files per month.

SPACE REQUIRED FOR REORGANIZATION

It is also important to consider that some disk space is required for reorganization of the server after improper program termination. In the worst case, double the space for keeping meta-information is required during reorganization. For our example above this means that the maximum additional disk space needed sums up to:

$$50{,}000 \times (0.3\ \text{kB} + 10 \times 0.5\ \text{kB}) = 265\ \text{MB HTML} +$$
$$10{,}000 \times (0.3\ \text{kB} + 3 \times 0.5\ \text{kB}) = 18\ \text{MB images} +$$
$$2{,}000 \times (0.3\ \text{kB} + 2 \times 0.5\ \text{kB}) = 2.6\ \text{MB multimedia} = 286\ \text{MB total}.$$

Taking all the space requirements estimated until now, the server in our example should be given 1186 MB plus 286 MB free space for reallocation plus about 250 MB to keep the log files on disk for the current month. This means that a 2 GB disk would be satisfactory for a fairly big server.

1.2.4 CPU POWER, MEMORY AND SYSTEM CONFIGURATION REQUIREMENTS

Of the three factors, CPU power, memory and system configuration requirements, the least critical is CPU power, as is usually the case for server systems. The best configuration for a Hyperwave Information Server is a system where the speed of the I/O subsystem is high.

Memory consumption depends on several factors. The server itself has a certain amount of static memory consumption and about 20 MB is required for the file cache. Further, memory use depends on the number of sessions with WWW access currently running on the server. This in turn is dictated partially by the session pools configured for your server and partially by the number of identified users logged in to the server (see *Hyperwave Administrator's Guide* for information about session pools). Lastly, it is dependent upon the number of documents served.

Note that the numbers below are the memory actually required by the server and that your operating system will also require a certain amount of additional memory.

Static	File cache	Per user	Per document
24 MB	20 MB	400 kB	64 B

Table 2: Memory requirements of the NT Hyperwave Information Server

CONFIGURATION SETTINGS FOR BETTER PERFORMANCE

Check if Windows NT (this only works for NT Server and not for NT Workstation) is optimized for network applications. You will find this information under Control Panel→Network→Services→Server. Make sure that "Maximize Throughput for Network Applications" is selected.

If you are an experienced Windows NT Administrator and you want to tune the TCP-IP performance of your Hyperwave Information Server, you may try setting the following registry values:

- add Registry Entry Tcpip/Parameters/MaxFreeTcbs=0x186a. This increases the TCB timewait table to 120000 entries. Default is 2000.
- Add Registry Entry Tcpip/Parameters/MaxHashTableSize=0x10000. This sets TCB hash table size to 65,536 entries. Default is 512.
- Add Registry Entry Tcpip/Parameters/TcpTimedWaitDelay=0x3c. This sets TIME_WAIT parameter to 60 seconds (non-RFC 1122). Default is 240.

For multi-processor machines try the following:

- Set NDIS/Parameters/ProcessorAffinityMask to 0. This forces the processor that handles interrupt to also handle that DPC. Default is any processor.

1.3 INSTALLING HYPERWAVE INFORMATION SERVER FOR WINDOWS NT

The Hyperwave Information Server for Windows NT comes with an easy-to-use installation program, similar to that of most Windows programs. This installation program installs the server itself as well as all associated tools and add-ons.

IMPORTANT INFORMATION ABOUT PATCHES

Please be sure to get all patches available for the Hyperwave Information Server version you plan to install. The patches can be found at

```
ftp://ftp.hyperwave.com/pub/Hyperwave/patches
```

The `readme.txt` file in this directory describes the patches and gives an overall description of the installation. Each patch contains its own `readme.txt` file to describe the problem it solves and an exact installation procedure.

Because some patches must be applied before an installation or update, it is important that you carefully read the `readme.txt` file for each patch BEFORE you install the patch or the Hyperwave Information Server itself.

Note: To install the server, you must be the administrator of the machine you are installing the server on.

1.3.1 SOFTWARE REQUIREMENTS

SERVICE PACK 3

If you are installing the server under Windows NT 4.0, it is highly recommended that you install the Service Pack 3 from Microsoft. If you do not do this, network transmission problems may arise.

MICROSOFT FIXES

If problems having to do with TCP/IP or file system cache arise (e.g. very long response times or virtual memory runs out), you should consider installing the Microsoft hotfixes that are available for these operating system errors:

- `2gcrash`: Improves file cache policies and performance of very large databases (>200,000 objects).
- `iis4-fix`: This fix remedies the long delays or timeouts that can occur due to a race condition in Microsoft TCP/IP, especially on the first connection from the local machine.

You can get these fixes online from Microsoft at:

```
ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/hotfixes-postSP3
```

Please note that it is very important that you install the fixes in the order given above. Also note that neither Hyperwave Information Management nor Microsoft guarantees that these fixes are free of any unknown side-effects Although Service Pack 4 is available, we do not recommend installing it instead of the fixes because we have not yet tested it.

1.3.2 INSTALLING THE SERVER AND TOOLS

STARTING THE INSTALLATION PROCESS

To start the installation process, put your Hyperwave CD into your CD drive, which should start Hyperwave Setup (see Figure 1) automatically. If automatic starting of CDs is disabled, installation is started by clicking on the file <*path_to_cd*>`\Winnt\setup.exe` in the Microsoft Explorer.

Select the component group you want to install by clicking on the corresponding phrase in the "Hyperwave Setup" window.

Figure 1: Starting installation

INSTALLATION OPTIONS

Server: This option allows you to install the server and/or the command line tools. The tools are a group of command line tools which can be used to upload documents to or delete them from the server, modify attributes of objects, administrate users and groups, etc. It is highly recommended to install the tools along with the server. See the *Hyperwave Administrator's Guide* for details on the available tools and how to use them.

Client add-ons: This option lets you install the Hyperwave Publishing Wizard, ODMA (Open Document Management API) or Hyperwave Virtual Folders.

Important: *Please follow the detailed instructions for the installation of all client software in the Hyperwave User's Guide.*

The Hyperwave Publishing Wizard is a graphical tool designed to make the process of publishing documents to a Hyperwave Information Server as simple as possible. It plugs into Microsoft's Web Publishing Wizard, which means that you can publish documents directly from most new Microsoft programs. You can also upload whole directory trees that you have prepared on your local disk to Hyperwave Information Server with just a few mouse clicks. See the *Hyperwave User's Guide* for details on using the Wizard.

ODMA allows you to use Microsoft Word '97 to edit Word documents directly on the Hyperwave Information Server (see the *Hyperwave User's Guide* for more information on ODMA). The requirements for installing ODMA are:

- Windows 95 or Windows NT 4.0
- TCP/IP properly set up

- Winsock 2

Hyperwave Virtual Folders is an extension to the Microsoft Explorer that allows you to browse Hyperwave collections as you would browse folders in a network drive.

3rd party software: This lets you install third party software which you may need when using the server or add-ons, e.g. the Adobe Acrobat Reader (for reading the Hyperwave manuals in PDF format), Perl for Windows NT and the Microsoft Web Publishing Wizard (required if using the Hyperwave Publishing Wizard).

Explore documentation: This lets you view the HTML or PDF version of the Hyperwave Information Server guides.

Exit: End setup.

SERVER AND TOOLS

If you select **Server**, the window in Figure 2 appears. This window allows you to install the server, the command line tools, or both, by checking the appropriate boxes. Here you can also specify the directory where you want these components installed.

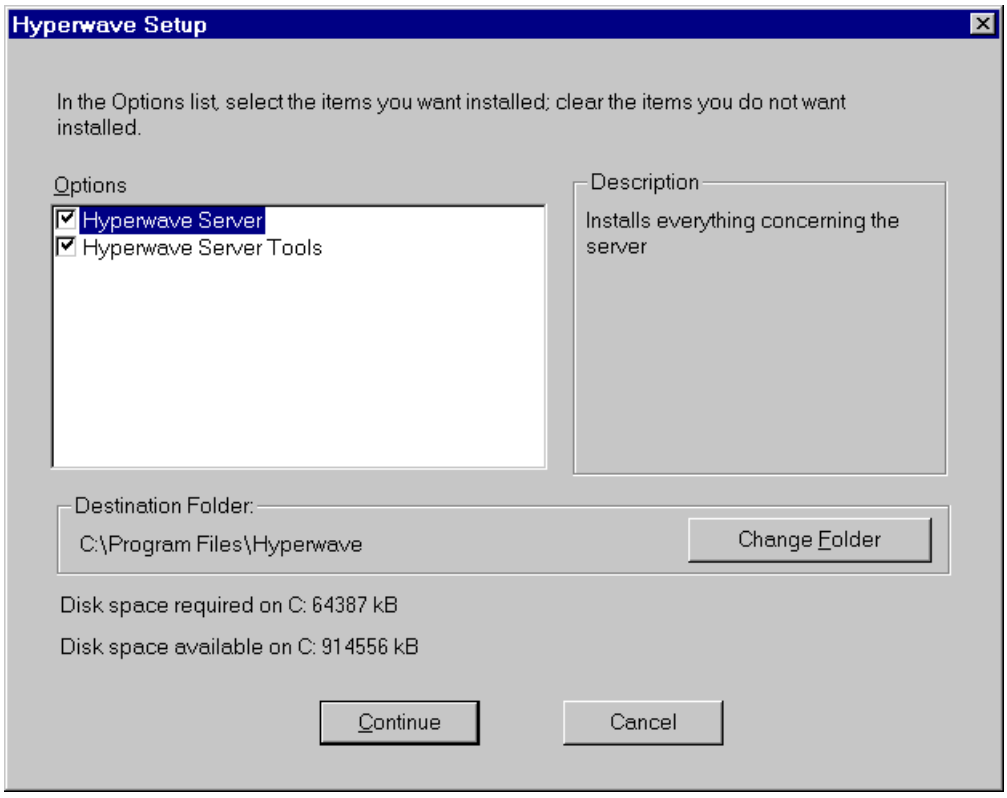


Figure 2: Installing the server and tools/selecting a destination directory

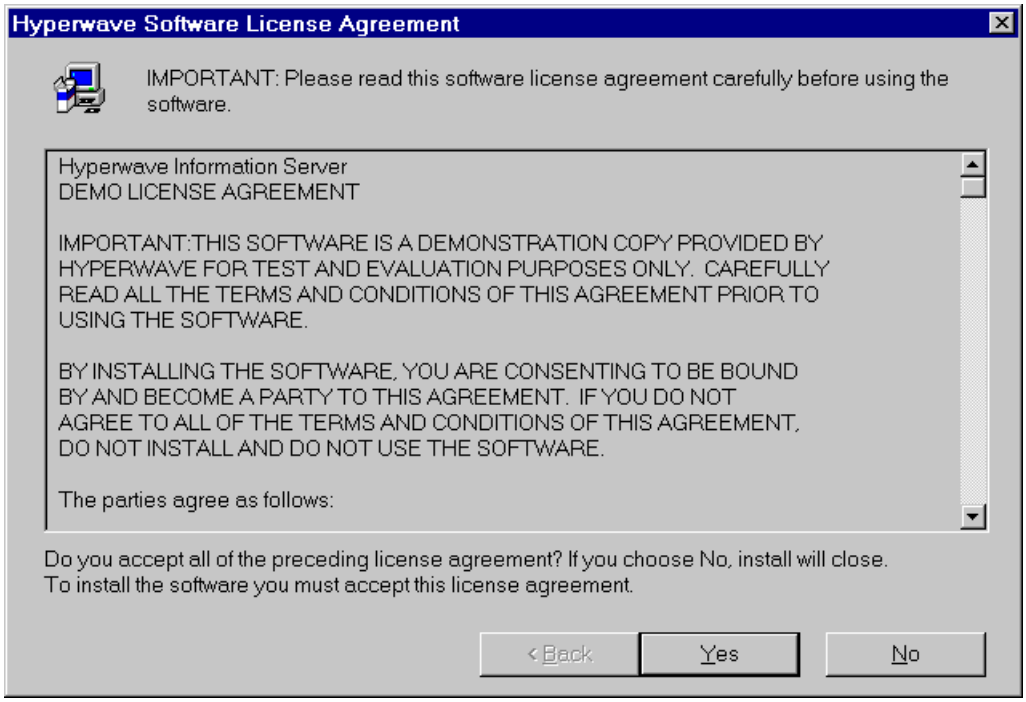


Figure 3: The Hyperwave license agreement

HYPERWAVE LICENSE AGREEMENT

The next window displays the Hyperwave Software license agreement (see Figure 3). Please read the license text carefully before proceeding.

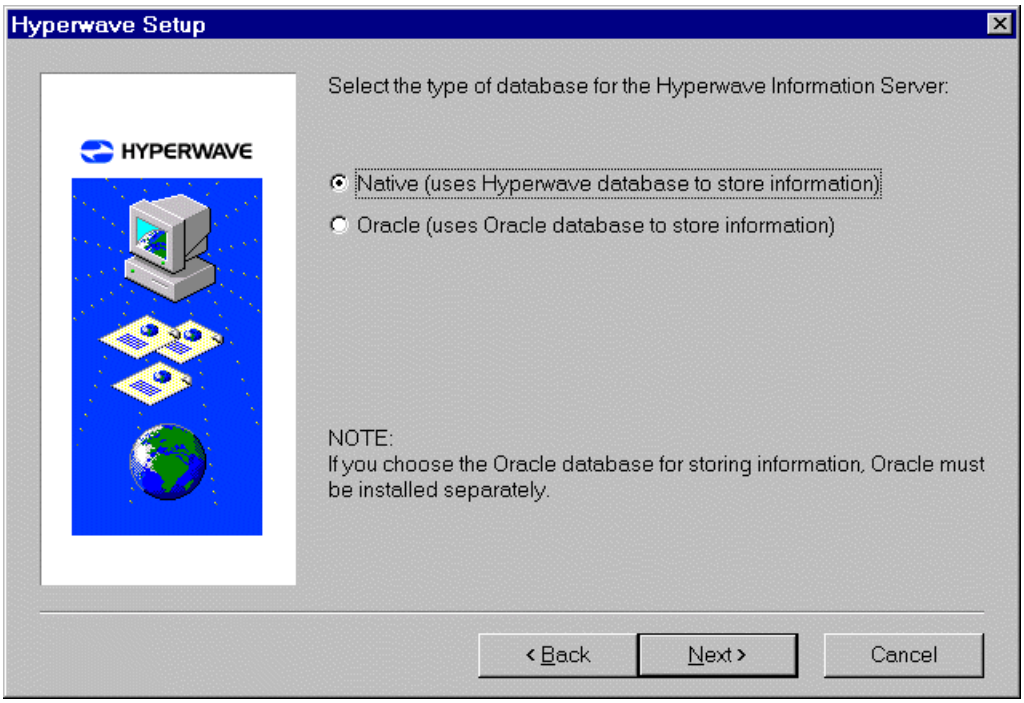


Figure 4: Selecting the native or Oracle database

ORACLE OR NATIVE DATABASE

Now you can select whether you want to use Hyperwave Information Server's native database or Oracle to store information (see Figure 4). Note that if you select Oracle, you must install Oracle separately. See page 12 for details.

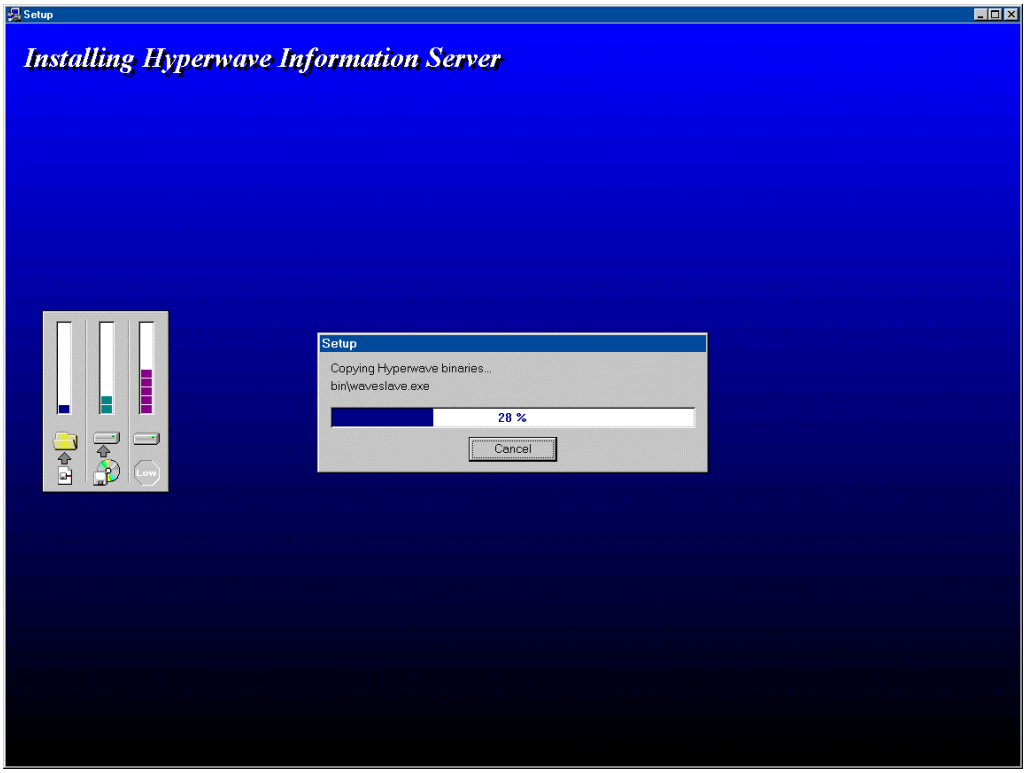


Figure 5: Actual installation

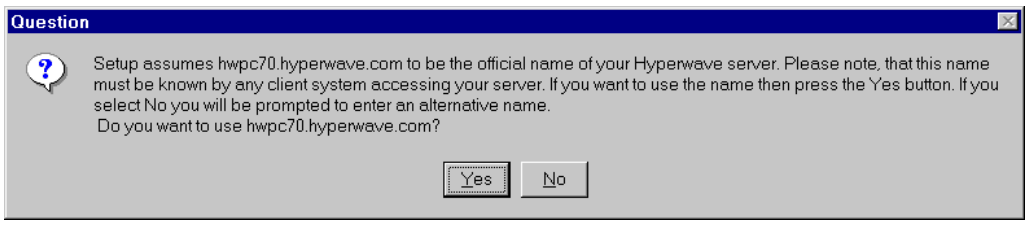
SEARCHING FOR A PREVIOUSLY INSTALLED SERVER

After you select the desired components, the install program searches for a previously installed Hyperwave Information Server and tools. If it finds anything (which of course it should not during a first installation; if it does, see Upgrading the Server, page 10), you can update the existing server or select another directory for full install.

When this is finished, the server and/or tools files will be installed (see Figure 5) in the directory you chose above.

ENTERING THE FULL INTERNET HOST NAME

The next step is to confirm the full Internet host name (the one by which the host is recognizable by the rest of the world) of the computer where you are installing the server. The install program looks up the host name itself and asks you to confirm if it is OK. If this is the name you want to use, just press "Yes" (see below).



If you want to enter a different host name (an alias), press "No". A window appears where you can enter an alternate host name (Figure 6).

Note: *This name must be entered correctly or else it will not be possible to start the server. For normal operation with cookie-aware web clients, the name must contain at least two dots. If you enter the name incorrectly and want to change it later, you can do this using WaveSetup or by directly editing the configuration file* `.db.contr.rc`.

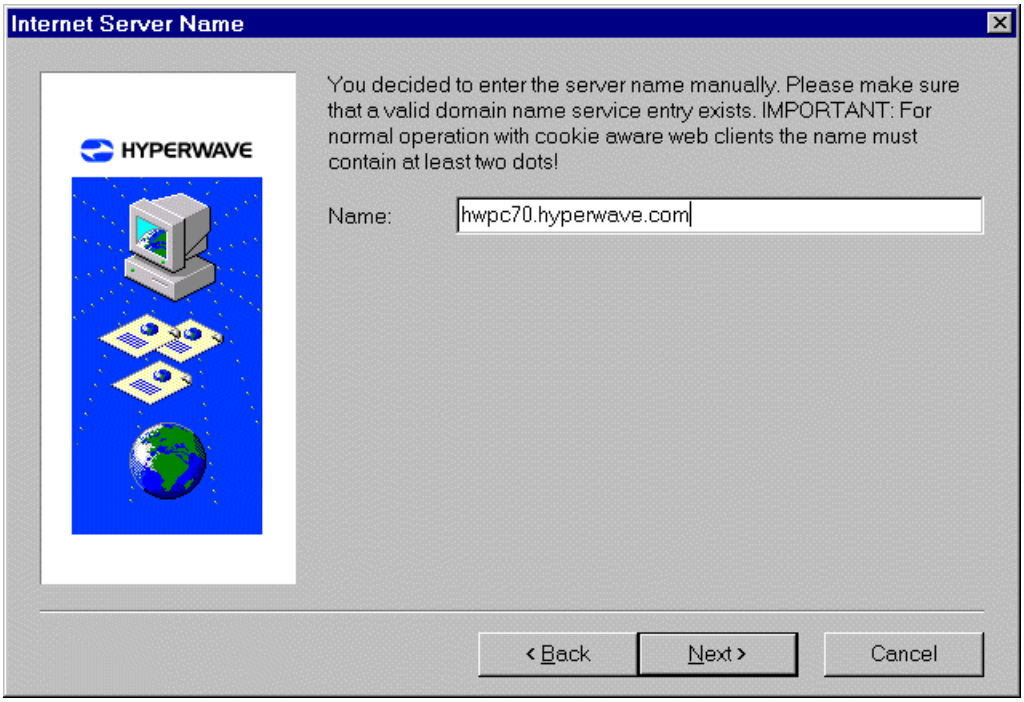
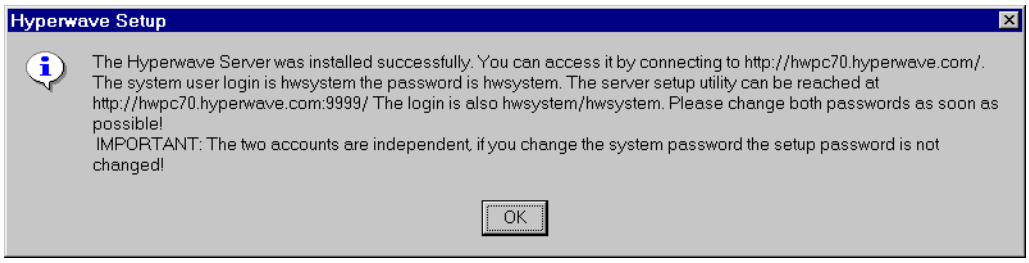


Figure 6: Entering an alternate host name

After you press "Next", an information window appears which contains the name of your server and instructions on how to access WaveSetup, the server configuration tool:



Click on "OK" to finish server installation. You must restart the computer before starting the server.

1.3.3 UPGRADING THE SERVER

This section is for people who have already installed a Hyperwave Information Server for Windows NT and would like to upgrade the software.

Note: When making an upgrade, the license file is not overwritten.

STARTING THE UPGRADE PROCESS

To start the upgrade process, put your Hyperwave CD into your CD drive, which should start Hyperwave Setup (see Figure 1) automatically. If automatic starting of CDs is disabled, upgrade is started by clicking on the file <*path_to_cd*>`\Winnt\setup.exe` in the Microsoft Explorer. The setup program will guide you through the upgrade process. Note that the same setup package is used for both installation and upgrade of the server.

LICENSE FILE

Please note that if you are upgrading from a 2.x version of Hyperwave Information Server to a 4.x version, you will need a new license. You can get a new license by sending an email to `license@hyperwave.com`.

After you select the components you want to install (see page 5), the installation program searches for previously installed components in your system. If it finds an existing server, the window in Figure 7 appears. Click on "Yes" to upgrade the existing server, or "No" to make a full installation in a different directory.

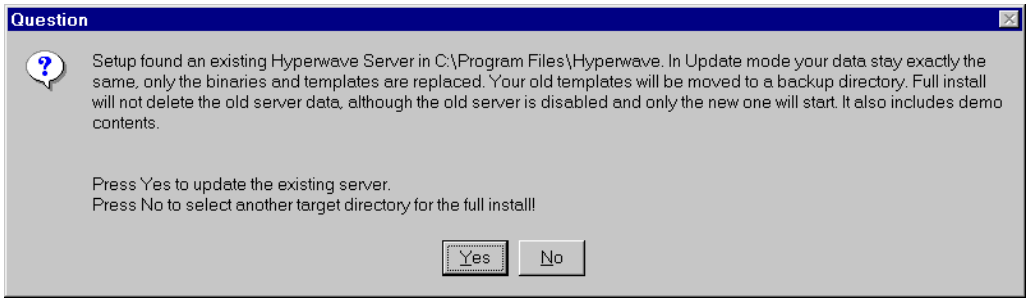


Figure 7: Choosing to make an upgrade or a full installation

The warning below will also appear if a Hyperwave Information Server is already installed on your system.

This indicates that an entry is being made in the server control manager so that the newly installed server can be started automatically when your computer is booted.

Note: *If you install a new server in a different directory instead of upgrading the existing one, you will not be able to start the formerly installed server after you have installed the new server. Also note that you will not be able to de-install the old server with the de-installation program, i.e. you will only be able to uninstall it manually.*

In the course of installation or upgrade, the warning below appears because HOME has already been set by the last Hyperwave Information Server installation (this can also appear if you have never installed the server before because another program may have set the HOME environment variable).

The last window that appears allows you to start the server if desired.

Figure 8: Upgrade is finished

PLACE TEMPLATES

With version 2.6 and above of Hyperwave Information Server, the new PLACE templates are no longer installed directly in the `wavemaster` directory, but rather in a directory named after the version number. For example, for version 4.0, the PLACE include files are found in the directory `wavemaster/v4.0/include` instead of in `wavemaster/include`. If you make an upgrade to version 4.1, the 4.0 templates are saved in a time-stamped directory.

If you want to change the appearance of the interface, see the documentation on the PLACE language in the *Hyperwave Programmer's Guide*.

FILES CHANGED DURING UPGRADE

If you are upgrading to a 4.x version and are switching from Hyperwave Information Server's native database to Oracle, the necessary changes are automatically made in the server's main configuration file, `.db.contr.rc`, during the upgrade.

FILES WHICH CAN BE DELETED AFTER UPGRADE

If you are upgrading to a 4.x version, the `dbserver` binary as well as the `dbserver` directory can be removed. It is recommended to make a backup of the `dbserver` directory before removal.

1.3.4 USING ORACLE WITH HYPERWAVE INFORMATION SERVER

During installation of Hyperwave Information Server, you are given the option of using either Hyperwave Information Server's native database or the Oracle database. If you decide to use Oracle, Oracle must be installed separately.

REQUIREMENTS

Platform: The option to use the Oracle database with Hyperwave Information Server is currently available for Sun Solaris 2.5.1 and Windows NT.

Oracle 8 database server: Oracle 8.0.3 (or higher) must be installed **before** you install the Hyperwave Information Server, and the tablespaces necessary for the server must have been created (see below).

Oracle database user: Because Hyperwave Information Server needs to have access to the Oracle server, you must create an Oracle user for Hyperwave. This user must have the proper access rights to put data into the tablespaces.

Oracle 8 client: The Oracle client software (version 8.0.4.x.x or higher) must be installed on the computer on which you are planning to install Hyperwave Information Server. Information Server and the Oracle client do not necessarily have to be installed on the same computer where the Oracle server is installed, however, for performance reasons it is recommended.

STARTING THE INFORMATION SERVER

When you start Hyperwave Information Server with Oracle for the first time, only the WaveSetup configuration tool and not the server itself will be started. At this time, certain parameters of the Oracle database must be configured. See page 16 for details.

*Note: Never use Oracle tools such as SQL*Plus to alter the tables which the Hyperwave Information Server manages!*

1.3.4.1 REQUIRED TABLESPACES AND TABLES

Certain tablespaces must exist when installing Hyperwave Information Server for use with Oracle.

Tablespace	Default INITIAL	Default NEXT	Default PCTINCREASE	Default MAXEXTENTS	Size	Next Extent
HWUSERS	5M	5M	0	100	200M	100M
HWINDEX	3M	3M	0	100	150M	50M
HWLOB	200M	50M	0	100	500M	50M

If necessary, these names can be changed. If you do this, you will have to make changes in your `.db.contr.rc` file to the following variables:

```
WAVEORACLE::USER_TABLESPACE_NAME
WAVEORACLE::INDEX_TABLESPACE_NAME
WAVEORACLE::LOB_TABLESPACE_NAME
```

The space reserved for Hyperwave thus initially takes up about 800 MB of hard disk space. Because most tables derive their parameters from the tablespaces, the default storage parameters of the tablespaces are very important.

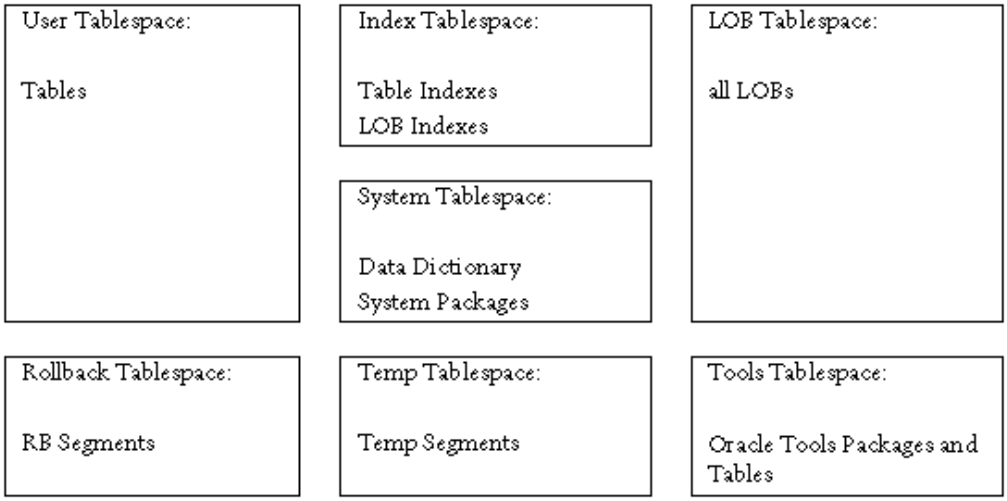


Figure 9: Recommended tablespace layout when using Hyperwave with Oracle

Figure 9 shows the recommended tablespace layout when using Hyperwave with Oracle. For performance reasons, the tablespaces should be divided among the hard disks as described on page 14.

Tables	PCTFREE	PCTUSED	INITIAL	NEXT	PCTINCREASE	MAXEXTENTS (*)
HWANCHORTABLE	4	93	TS def.	TS def.	TS def.	TS def.
HWCONTAINERTABLE	4	93	TS def.	TS def.	TS def.	TS def.
HWDOCUMENTTABLE	4	93	TS def.	TS def.	TS def.	TS def.
HWLINKTABLE	4	93	TS def.	TS def.	TS def.	TS def.
HWVERSIONTABLE	4	93	TS def.	TS def.	TS def.	TS def.
HWDOCUMENTREPOSITORY	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP	30	40	100	100	0	TS def.
HWOBJECTSOUP_TS	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_TS_U	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_U32	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_U32_U	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_U64	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_U64_U	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_VC	Oracle def.	Oracle def.	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_VC_U	Oracle def.	Oracle def.	TS def.	TS def.	TS def.	TS def.

Oracle def. = Oracle default
TS def. = Tablespace default

Note: *The values marked in gray are the only values that can or should be changed by the server administrator.*

ORACLE SYSTEM PARAMETERS

The following values are recommended for configuring the Oracle system parameters:

Temp Tablespace: Datafilesize=5MB;Autoextend on;Maxsize=100MB;NextExtent=5MB

Rollback Tablespace: Datafilesize=100MB; Autoextend on; Maxsize=200MB; Nextextent=10MB; Optimal=25MB

Rollback Segments: 4 segments with an initial size of roughly 20MB

Note: If you are expecting very large indexes, you may have to increase the Maxsize of the Temp Tablespace. Or, if you are upgrading the Oracle server, and the data sets on the old server are very large (greater than 100MB) you should periodically check the Storage Manager during the upgrade process in order to see if the tablespaces still have space.

HARD DISK CONFIGURATION

It is possible to use one hard disk for all the tables, however, for performance reasons it is recommended to distribute the tablespaces on five hard disks as described below.

- ♦ These entries must be on the specified hard disk
- ➢ These entries can be on a disk other than the one specified

Hard Disk 1

- ♦ User Tablespace
- ♦ LOB Tablespace
- ♦ Control File 1
- ➢ Tools Tablespace

Hard Disk 2

- ♦ Index Tablespace
- ♦ Control File 2
- ➢ Temp Tablespace
- ➢ Temporary Space for Backup and Data Compression

Hard Disk 3

- ♦ System Tablespace
- ♦ Control File 3
- ➢ Rollback Tablespace

Hard Disks 4 and 5 (mirrored)

- ♦ Archive logs
- ♦ Hot Backup
- ➢ Misc. (tar directory, etc.)

1.3.4.2 DELETING DATA FROM A PREVIOUSLY INSTALLED ORACLE SERVER

If you are using Hyperwave with a previously installed Oracle database which contains data and you would like to delete this data, you must drop all tables Hyperwave creates, as well as the `HWObjectSoup_REGISTRY.inf` file, which is in the `waveoracle` directory. If you then restart the server, it will create a new, empty Hyperwave database. Also, a new system user with the default system password will be created.

1.3.4.3 TOOLS FOR CONVERTING BETWEEN HYPERWAVE INFORMATION SERVER AND ORACLE

GENERAL GUIDELINES

The source data is not deleted by the tools (you may delete it manually).

HWNATIVE2ORACLE

`hwnative2oracle` converts an existing Hyperwave database to Oracle. This is done as follows:

1. Stop the server with `hwstop`.
2. Check for a file called `DBOK` in the `wavestore` directory. If it exists, the database is in a consistent state and can be converted.
3. Install Hyperwave Information Server using option “Oracle database” (see the requirements for Oracle installation in section 1.3.4.
4. Configure Oracle settings in WaveSetup.
   a) execute `hwstart` (only `hwservercontrol` is started).
   b) use WaveSetup (see the Hyperwave Administrator’s Guide)
   c) do not restart the server (use `hwstop`)
5. If it exists, delete the file `HWObjectSoup_REGISTRY.inf` (in `waveoracle` directory)
6. Start `hwnative2oracle` in the home directory of the Hyperwave Information Server.

WARNING: All data belonging to the Oracle Account that Hyperwave uses to access Oracle will be destroyed during the conversion process (HWIS data in Oracle database). Data belonging to other users, whether it resides in the same instance or not, will not be affected by the conversion.

HWORACLE2NATIVE

`hworacle2native` converts an existing Oracle database to a Hyperwave database. This is done as follows:

1. Stop the server with `hwstop`.
2. Install Hyperwave Information Server using option “native database”.
3. If it exists, delete file `HWObjectSoup_REGISTRY.inf` (in `wavestore` directory)
4. Start `hworacle2native` in the home directory of the Hyperwave Information Server.

WARNING: All data residing on the target Hyperwave instance (directories `wavestore` *and* `dcserver`*) will be destroyed during the conversion process.*

1.3.5 STARTING AND STOPPING THE SERVER

The server is started automatically when you boot the computer where it is installed. To start or stop it manually, click on the Windows "Start" icon, then select "Settings" → "Control Panel". Click on the "Services" icon in the Control panel window. The Services box (see Figure 10) will appear. Here you can select "Hyperwave Information Server" and start or stop it.

HWSTART AND HWSTOP

The command line tools `hwstart` and `hwstop` can also be used to start and stop the server, and are entered as such in the command line. Both allow you to use the option `–version` to get version information about the tools.

NTSERVICECONTROL

As mentioned above, when Hyperwave is installed, an entry is made in the Windows NT Services box. If you start the server from this window, a tool called NTServiceControl is called in order to start the server. This tool can also be used in the command line in order to generate the Service window entry again if there is an error (e.g. an error with setup). This is done by entering

```
ntservicecontrol -install
```

in the command line.

The path for the server is taken from the executable, which means that this will work if `ntservicecontrol` is in the `$HOME/bin` directory of your server.

MULTIPLE SERVERS ON THE SAME SYSTEM

NTServiceControl can be used to allow several servers to coexist on an NT system. This is done as follows:

1. Stop your currently running Hyperwave Information Server, “Server A”.
2. Change your PATH variable by taking out the `bin` directory for Server A, and adding the `bin` directory of the server you want to activate, Server B.
3. Change to the `bin` directory of Server B.
4. Start `ntservicecontrol -install`.
5. Use `hwstart`, which should now start Server B.

Note: *If you use NTServiceControl to recreate the Hyperwave entry under Services, all user settings (e.g. manual starting of the server) are lost because the standard service entry is always generated.*

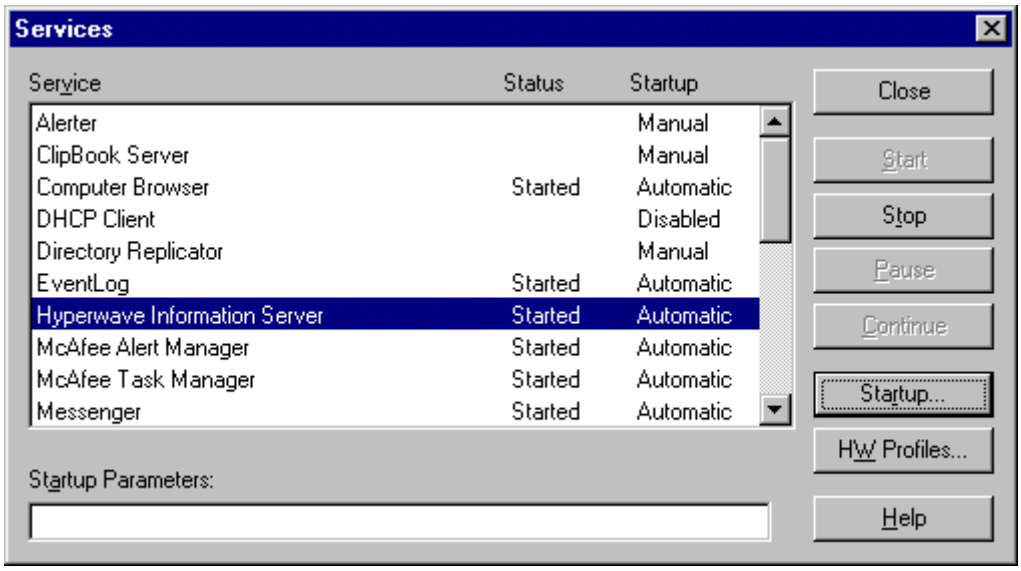


Figure 10: The Services box

USER NAME AND PASSWORD

When the NT server is started for the first time, there is one user account on the server with the user name “hwsystem” and the password “hwsystem”. You should change this password as soon as possible. This user belongs to the group of system administrators ("system") and thus this user has rights to edit all information on the server and create new users and groups. For more information on how to create new user accounts see *The Hyperwave Administrator’s Guide*.

STARTING INFORMATION SERVER WHEN USING ORACLE

If you are starting the server for the first time using the Oracle database, `hwservercontrol` will notice that Oracle has not yet been configured and will start in setup only mode, allowing you to configure Oracle with WaveSetup. You must configure the parameters explained below for Oracle because the Hyperwave Information Server needs these parameters for startup.

ORACLE PARAMETERS IN WAVESETUP

It is possible to configure several parameters associated with the Oracle database in WaveSetup. These parameters are found on the **Database** page in the tool, which only appears when using Hyperwave with Oracle:

- The user name of the Oracle user (required)
- The password of the Oracle user (required)
- **DB String**: This is required if you are not connecting to the default data base (name of appropriate TNS entry).
- The PCTFREE, PCTUSED, INITIAL, NEXT and PCTINCREASE parameters for the HWOBJECTSOUP table.

When you are finished configuring, restart the server by clicking on the "Restart Server Now" button in WaveSetup or by entering `hwstart -force` in the command line.

PROBLEMS WITH STARTING AND STOPPING THE SERVER

When the NT Hyperwave Information Server stops due to an error, the Services window still says that the server is running even though it is not. See the section on Troubleshooting in the *Hyperwave Administrator's Guide* to find out what to do in this case.

1.3.6 CONFIGURING THE SERVER

The Hyperwave Information Server is configured using the WaveSetup tool, which is started automatically when the server is started. It is accessed by connecting to `http://`*<your.server.name>*`:9999/`. The user name and password for WaveSetup are both originally "hwsystem". The password should be changed as soon as possible using the WaveSetup tool.

Note: *The user name and password combination of the server and that of WaveSetup are completely independent, i.e. changing one does not change the other.*

For details on configurable parameters of the server, see *Hyperwave Administrator's Guide*.

CONFIGURING SMTP HOST

It is particularly important to make sure you configure the SMTP host. This is because processes such as `hwservercontrol` and `wavenotify` have to send notifications by mail, and thus the server has to know where the SMTP server (the server used to send emails) is. This is configured using WaveSetup in the **General** section under **Administration**. The SMTP host must be configured or else the server will not be able to send mails.

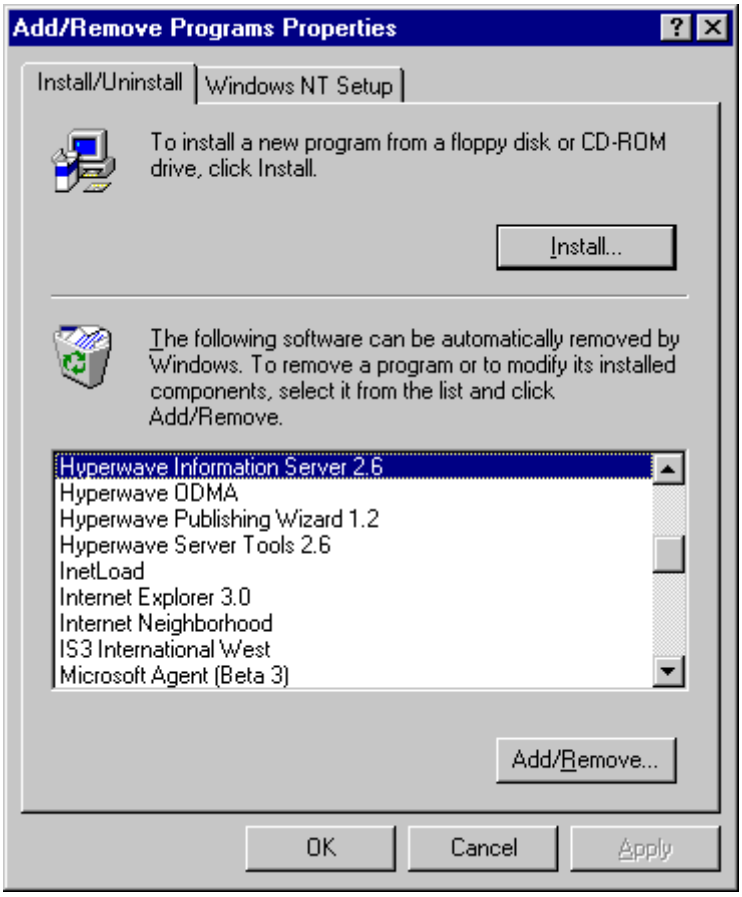


Figure 11: The Add/Remove Properties Programs window

CONFIGURATION FILE The server can also be configured by directly editing the configuration file `.db.contr.rc`. This file is found in the directory where you installed Hyperwave Information Server. For a detailed explanation of the variables in this file, see *The Hyperwave Administrator's Guide*.

1.3.7 UNINSTALLING THE SERVER

The server is uninstalled by clicking on the Windows "Start" icon, then selecting "Settings" → "Control Panel". Select the "Add/Remove Programs" icon in the Control Panel window. The Add/Remove Programs Properties window appears (see Figure 11). Select "Hyperwave Information Server" and click on the Add/Remove button.

Note: You must *stop the server before uninstalling it or else it will not be possible to uninstall all parts of it. This can be done with the command line tool* `hwstop`.

Note: If the uninstall program fails to delete any files or directories in the Hyperwave directory, these files must be deleted by hand.

1.3.8 THE DEMO DATA SET

Hyperwave comes with a demo data set which is automatically uploaded to the server when making a new installation. If you are upgrading and want to upload the latest version of the demo data set, you must upload the file `tutorial.hif`, which contains this data. It is on the CD in the `manual` directory.

To get the information into a Hyperwave Information Server use the `hifimport` command as shown below.

`$ hifimport -hghost` *<name_of_HWIS>* `-overwrite replace` *<name_target_collection>* *<path_to_CD>*`/manual/tutorial.hif`

During the import you are asked for a user name and password. Enter a user who has enough access rights to the target collection to insert the documents. After the import you can find the documents in the specified target collection.

After inserting the data you will find a welcome page in the specified target collection containing a link "Hyperwave Demonstration Program". Follow this link to start the tutorial.

1.3.9 SUPPORT

The Hyperwave support team can be contacted through our Web site, by email, or by telephone.

WEB SITE We provide a contact form where you can submit structured requests to our support experts at the following addresses:

USA: `http://www.hyperwave.com/support/helpdesk`

Germany: `http://www.hyperwave.de/support/helpdesk`

EMAIL You can also direct your questions and comments to us by email. Email should be used if you want to submit log files and other data that will help us while analyzing problems.

USA: `support@hyperwave.com`

Germany: `support@hyperwave.de`

TELEPHONE Call to discuss your wishes personally with one of our specialists at the following numbers:

USA: 1-888-644-3100

Germany: +49 89 993074-33

2 INSTALLING HYPERWAVE INFORMATION SERVER FOR UNIX

This chapter describes the steps necessary to install or upgrade the Hyperwave Information Server for UNIX platforms, including where to get the software, system requirements and server registration.

2.1 GETTING THE SERVER LICENSE

BEFORE YOU HAVE A LICENSE

The software package contains a fully functional copy of Hyperwave Information Server. However, it does not contain a license to evaluate or permanently use the product in a network. With it, you can install the server software, start it and access the server with a browser installed locally on the computer where the server software is installed. Only 3 user sessions are allowed, and 2000 documents can be uploaded to the server.

GETTING AN EVALUATION OR COMMERCIAL LICENSE

An evaluation license for Hyperwave Information Server for a 30-day trial period with network access and a limitation to 5 concurrent user sessions and 2000 documents is available by registering at `http://www.hyperwave.com/download/license`. If you need any extensions to the license for testing purposes, e.g. more users, more documents, etc., or, if you would like to purchase the product, please contact our sales team at `sales@hyperwave.com`.

INSTALLING THE LICENSE FILE

As soon as your registration is accepted you will get a new server license file for your site. This new license file will be sent to you as email. Take the part of the email from

```
----BEGIN HYPERWAVE LICENSE-----
```

to

```
----END HYPERWAVE LICENSE-----
```

and put it in a text file called `.server_license` (note the "s" in license) and put it in `hwsystem`'s home directory. Both the beginning and ending string above must be part of the file.

Note: Do not change the contents of this file! It contains a checksum that must fit the contents or Hyperwave Information Server will not start.

HOW LONG IS MY LICENSE VALID?

If you register Hyperwave Information Server and get a customer (not evaluation) license for the software, this license is good for all update versions of an entire major release. This means, for example, that if you have a license for Hyperwave 2.1, it is also good for all other 2.x versions.

KEEPING A BACKUP COPY OF YOUR LICENSE

It is a good idea to keep a backup copy of any license you receive, in case there are problems with a new license. As soon as there is no valid license file you will not be able to work with the server.

The IP address of your host (or hosts) is part of the license. If you intend to move the server to a different host you have to change your registration. Please apply for the changed license in advance by contacting `support@hyperwave.com`.

If you get a limited license for a certain time period (e.g. 1 year), please remember to apply for a new license well before the date your license expires, which is given as `TimeExpire` in the license text.

2.2 INSTALLATION METHODS

In this chapter all aspects of installation for the UNIX platforms are described. You will find a list of supported platforms and a detailed description of system requirements for the server including examples. Lastly, installation and registration of the server are described.

There are two different methods for installing the UNIX server, and which one you use depends on factors such as how you got the software (on CD ROM or by FTP).

INSTALLATION FROM CD ROM

The Hyperwave CD ROM comes with an installation script which guides you through the installation process (see page 26). There are, however, certain pre- and post-installation steps which cannot be done by the script. These are explained in the course of this chapter.

HWINSTTAR

The *Hyperwave Installation from Tar File Script* (`hwinsttar`) is a command line tool that extracts the software from a tar file (see page 26).

2.3 SUPPORTED PLATFORMS

The following table gives you an overview of the platforms for which the Hyperwave Information Server for UNIX is currently available.

Hardware Platform	Operating System	Verity support
DEC Alpha	DEC UNIX 4.0	yes
HP 700 series	HP-UX 10.20 or above	yes
Silicon Graphics	IRIX 5.3	yes
Sun Sparc	Solaris 2.5.1	yes
IBM RS/6000	AIX 4.3	yes
Personal Computers	Linux 2.0.x-ELF	no
SNI RM Series	Reliant UNIX 5.43	no

Table 3: The UNIX platforms for which Hyperwave is available

2.4 SYSTEM REQUIREMENTS

This section gives a detailed description of the system requirements for running a Hyperwave Information Server. Although the requirements described here are not thought to be the absolute minimum configuration, it is highly recommended to operate the server on a system that is not too far below these requirements in order to get acceptable performance.

FACTORS WHEN DETERMINING SYSTEM REQUIREMENTS

System requirements for operating a Hyperwave Information Server depend on the amount of documents you intend to serve, on the number of simultaneous users and on the dynamics of the data sets. Of course system requirements also depend on the hardware and operating system platform you choose. This section shows you how to calculate an estimate of the amount of hard disk space and memory required to run your server. However, example configurations are presented first so you can get a general idea about what you need to run your server.

2.4.1 EXAMPLE CONFIGURATIONS

In this section you will find example configurations for small, medium and large sites that should help you choose the configuration appropriate for your application.

SMALL SITES

In this context a *small* site is considered to store up to 2,000 documents and serve an average of 15 simultaneous sessions.

Such a site can be operated on a fairly small Linux PC, for example, a Pentium with 64 MB RAM. The documents and the server software require about 100 MB of disk space. Because peak load can be much more than 15 sessions, it might be necessary to install more memory depending on the environment in which the server is operated.

The configuration described here should be adequate to operate Hyperwave Information Server for evaluation purposes.

MEDIUM SITES

A *medium* site is considered to be a server with up to 15,000 documents and an average of 50 simultaneous user sessions, with roughly 500,000 user requests per month.

In this case we would recommend either a fast PC running Linux, for example a Pentium or Pentium Pro with at least 128 MB RAM installed, or a medium workstation. If you choose to use a workstation, keep in mind that 64-bit architectures such as DEC Alpha need nearly twice as much memory as 32-bit architectures do. For a 32-bit architecture, for example a SUN Sparc 10, at least 128 MB RAM is recommended; for a DEC Alpha, 256 MB is satisfactory.

Hyperwave Information Server is designed to guarantee consistency of the database even after a sudden power loss in the middle of a write access. This implies some additional synchronization. If you are planning to use Hyperwave for cooperative work or as a documentation server, the number of write accesses will be fairly high. In this case make sure that fast disks are installed.

LARGE SITES

Defining what a "large" site is is a bit difficult. "Large" could mean a large number of documents, a high number of simultaneous users, an extremely dynamic data set or a combination of these.

One good example of a large site is an electronic library server running in Graz. The server holds over 800,000 documents. Due to indexing of new journals a lot of write accesses take place. It is run on a DEC Alpha with 256 MB RAM.

2.4.2 DISK SPACE REQUIREMENTS

Disk space consumed by a Hyperwave Information Server is made up of several parts: the server software itself, the data kept on the server and the amount of space consumed by the log files for internal and statistical purposes.

SPACE REQUIRED BY THE SERVER SOFTWARE

Table 4 shows the amount of disk space required for the server software and the basic Hyperwave tools that come with the server for different platforms. Note that roughly double the amount of space for the software is required during installation.

Platform	Disk Space Needed
DEC Alpha under DEC UNIX 4.0	130 MB
HP 700 series under HP-UX 10.20 or above	110 MB
Silicon Graphics under IRIX 5.3	150 MB
Sun Sparc under Solaris 2.5.1	120 MB
IBM RS/6000 under AIX 4.3	110 MB
Intel PC under Linux 2.0.x (ELF binaries)	40 MB
SNI RM Series under Reliant UNIX 5.43	80 MB

Table 4: Disk space requirements of the server software depending on the platform

SPACE CONSUMED BY DOCUMENTS KEPT ON THE SERVER

Though the server itself takes up a certain amount of space, the most significant factor in determining space requirements is the amount of documents, object records and hyperlinks that you intend to keep on the server. The amount of disk space needed can be estimated using the following simple rules:

Text: Double the space for text documents (required for the full text index), and add an additional 300 bytes per document for meta-information. Hyperlinks are counted separately (see below).

Multimedia: Add an additional 300 bytes per document for meta-information. Again Hyperlinks are counted separately.

Hyperlinks: Independent of the document type, hyperlinks need approximately 500 bytes each for meta-information.

As an example consider a fairly large server with 50,000 HTML documents, 10,000 images and 2,000 other multimedia documents such as video, sound and 3D scenes. In this example, inline images used in HTML documents are included in the 10,000 images.

Let us further assume that HTML documents have an average size of 3 kB and contain an average of 10 hyperlinks per document including inline links. Images have an average size of 30 kB each and 3 hyperlinks per image. Last but not least, multimedia documents such as video, sound and 3D scenes have an average size of 150 kB and 2 hyperlinks per document.

This adds up to:

	Documents	Meta-Info	Hyperlinks	Total
HTML	50,000×2×3 kB	50,000×0.3 kB	50,000×10×0.5 kB	565 MB
Images	10,000×30 kB	10,000×0.3 kB	10,000×3×0.5 kB	318 MB
Multimedia	2,000×150 kB	2,000×0.3 kB	2,000×2×0.5 kB	303 MB
Total				1186 MB

Table 5: Disk space requirements for a fairly big Hyperwave Information Server

SPACE CONSUMED BY LOG FILES

The last factor in disk usage–space consumed by log files–depends on the load on the server and on the dynamics of the data. It also depends on the amount of time log files are kept on disk before moving them to archival storage. There is no reliable rule of thumb for calculating the amount of space needed. Here is an example instead: the IICM Hyperwave Information Server with over 200,000 documents and an average of over 700,000 monthly http requests produces an average of 250 MB of log files per month.

SPACE REQUIRED FOR REORGANIZATON

It is also important to consider that some disk space is required for reorganization of the server after improper program termination. In the worst case, double the space for keeping meta-information is required during reorganization. For our example above this means that the maximum additional disk space needed sums up to:

$$50{,}000 \times (0.3\ \text{kB} + 10 \times 0.5\ \text{kB}) = 265\ \text{MB HTML} +$$
$$10{,}000 \times (0.3\ \text{kB} + 3 \times 0.5\ \text{kB}) = 18\ \text{MB images} +$$
$$2{,}000 \times (0.3\ \text{kB} + 2 \times 0.5\ \text{kB}) = 2.6\ \text{MB multimedia} = 286\ \text{MB total}.$$

Taking all the space requirements estimated until now, the server in our example should be given 1186 MB plus 286 MB free space for reallocation plus about 250 MB to keep the log files on disk for the current month. This means that a 2 GB disk would be satisfactory for a fairly big server.

2.4.3 CPU POWER, MEMORY AND SYSTEM CONFIGURATION REQUIREMENTS

Of the three factors, CPU power, memory and system configuration requirements, the least critical is CPU power, as is usually the case for server systems. The best configuration for a Hyperwave Information Server is a system with adequate memory and high data throughput from and to the disk.

Memory consumption depends on several factors. The server itself has a certain amount of static memory consumption which depends on the architecture. Further, memory use depends on the number of sessions with WWW access currently running on the server. This is in turn dictated partially by the session pools configured for your server and partially by the number of identified users logged into the server (see *Hyperwave Administrator's Guide* for information about session pools). Lastly, it is dependent upon the number of documents served.

A session with WWW access is made up of the core session layer (`hgserver`) whose memory consumption is comparatively small, and the WWW access layer (WaveMaster). The memory consumption of the WWW access layer depends on whether your architecture supports multithreading, and if so, whether you have switched it on (see *Hyperwave Administrator's Guide*). Table 6 shows an overview of memory consumption of the server.

Platform	Static	Core session	WWW access w/ mt	WWW access w/o mt	Per document
DEC Alpha under DEC UNIX 4.0	80 MB	960 kB	256 kB	2.8 MB	112 B
HP PA-RISC under HP-UX 10.20	48 MB	800 kB	-	2.2 MB	64 B
Silicon Graphics under IRIX 5.3	50 MB	800 kB	-	2.2 MB	64 B
Sparc Station under Solaris 2.5.1	40 MB	800 kB	40kB	2.2 MB	64 B
IBM RS/6000 or PowerPC™ under AIX	42 MB	800 kB	-	2.2 MB	64 B
Intel PC under Linux 2.0.x (ELF binaries)	38 MB	800 kB	-	2.2 MB	64 B
SNI RM Series under Reliant UNIX	42 MB	800 kB	-	2.2 MB	64 B

mt=multithreading
-=architecture does not support multithreading

Table 6: Memory requirements of the UNIX Hyperwave Information Server

FILE DESCRIPTORS

After all the calculations of disk and memory consumption, one more aspect must be considered: the number of simultaneously open file descriptors. This number is dependent on the number of simultaneous users and document downloads. Inactive user sessions need 9 open file descriptors, several more are kept open to guarantee quick response if the load on the system is not too high. Active user sessions (=document download in progress) need a larger amount, depending on the documents fetched simultaneously.

2.5 INSTALLING/UPGRADING THE UNIX SERVER

This section describes all steps necessary for installing or upgrading the Hyperwave Information Server for UNIX, and contains instructions for starting, stopping and configuring the server.

IMPORTANT INFORMATION ABOUT PATCHES

Please be sure to get all patches available for the Hyperwave Information Server version you plan to install. The patches can be found at

```
ftp://ftp.hyperwave.com/pub/Hyperwave/patches
```

The `readme.txt` file in this directory describes the patches and gives an overall description of the installation. Each patch contains its own `readme.txt` file to describe the problem it solves and an exact installation procedure.

Because some patches must be applied before an installation or update, it is important that you carefully read the `readme.txt` file for each patch BEFORE you install the patch or the Hyperwave Information Server itself.

LICENSE FILE AND UPGRADE

Note that when you upgrade Hyperwave Information Server, the license file is not overwritten. Also note that if you are upgrading from a 2.x version of Hyperwave Information Server to a 4.x version, you will need a new license. You can get a new license by sending an email to `license@hyperwave.com`.

PACKAGES USED FOR UPGRADE

The same packages that are used for installation of the server are also used for upgrade.

UPGRADE AND HWSTART

Note that all versions of Hyperwave Information Server after 2.0 are started with the program `hwstart` rather than with `dbstart`. Because the `dbserver` module was replaced with the `wavestore` module in version 4.0, and `dbstart` starts `dbserver` and not `wavestore`, serious database consistency problems may arise if a 4.x version of the server is started with `dbstart`. Thus it is important that if you are keeping the server running with lines in your local boot script (see page 31) that you change the lines to use `hwstart`.

FILES CHANGED DURING UPGRADE

If you are upgrading to a 4.x version and are switching from Hyperwave Information Server's native database to Oracle, the necessary changes are automatically made in the server's main configuration file, `.db.contr.rc`, during the upgrade.

FILES WHICH CAN BE DELETED AFTER UPGRADE

If you are upgrading to a 4.x version, the `dbserver` binary as well as the `dbserver` directory can be removed. It is recommended to make a backup of the `dbserver` directory before removal.

2.5.1 BASIC SYSTEM PREPARATION

No matter which method you choose for installing your server, some basic steps are necessary to prepare your system. You need **root privileges** on the server host to do this.

Note: If you are using the install script from the CD, you will be guided through these steps and it is not absolutely necessary to complete them before starting the script.

1. Create a new UNIX user, for example `hwsystem`, under which the Hyperwave Information Server will run. You can also optionally create a new user group, for example `hyperwave` (note that some operating systems may restrict names to 8 characters so that only `hyperwav` is possible). Put the home directory of this user on a file system that has enough free disk space for the server. Give the user a standard C-shell (normally `/bin/csh`) or an enhanced version of the C-shell (normally `/bin/tcsh`). If you choose `tcsh`, make sure that you use `.cshrc` and not `.tcshrc`. This is necessary because the installation program looks for `.cshrc` in the home directory of `hwsystem` to store some parts of the configuration such as an extended path.
2. Create a directory `/usr/local/Hyperwave` with owner `hwsystem`, group `hyperwave` (optionally) and `0755` mode. This is the system-wide location for Hyperwave configuration files, publicly available tools, documentation and so on. You do not need much space in the file system of this directory as only symbolic links to the actual locations will be generated and no files will be stored there. The directory can also simply be omitted in which case you will get a warning during installation, but nothing bad will happen.

3. Install Perl version 5.002 or higher on the server host if it is not there already.

   It is recommended to have the Perl interpreter in `/usr/local/bin/perl` or at least have a link from this directory to the location of the interpreter because the scripts will look for it there. If you do not have Perl on your system yet, it can be obtained from nearly all the bigger FTP sites or you can install the precompiled version from the CD ROM. See `ftp://ftp.funet.fi/pub/languages/perl/CPAN/SITES.html` for a list of Perl ftp sites around the world.

4. Make sure `gzip` (the popular (de-)compression program) is installed on the server host and the location is included in the path of user `hwsystem`. It is needed to decompress files before and during the installation process.

After you have finished these steps, you are ready to start the installation process. The two UNIX installation methods are explained below.

2.5.2 INSTALLATION FROM CD ROM USING THE INSTALLATION SCRIPT

The installation script on the CD guides you through the UNIX Hyperwave Information Server installation. The installation script is started by entering:

<*path_to_cdrom*>`/unix/install`

in the command line in a UNIX shell.

ORACLE OR NATIVE DATABASE

On the Sun Solaris platform you have the option of using the native database or an Oracle database. If you select Oracle, you must install the Oracle database before you install Hyperwave Information Server. See page 27 for details on using the server with Oracle.

FINISHING SETUP

See Finishing Setup on page 28 for necessary post-installation steps. Refer to page 20 for instructions on how to register the server. How to start the server is found on page 32.

2.5.3 INSTALLATION USING HWINSTTAR

BASIC SYSTEM PREPARATION

Once you have taken the steps described on page 25, you can install Hyperwave Information Server with the `hwinsttar` program.

WHERE TO GET THE TAR FILES

The tar file distribution of the Hyperwave Information Server software consists of two parts – one part is the server software itself, the second part is the basic set of tools that comes with the server. Although not absolutely necessary, it is highly recommended to install both server and tools instead of only the server. The `hwinsttar` program itself is also included in the tar files. You can get the tar files from

`http://www.hyperwave.com/download`

The files are organized in directories according to platform.

UNPACKING THE TAR FILES

The first thing to do before starting `hwinsttar` is to unpack the tar files in `hwsystem`'s home directory by executing

```
gzip -dc server.tgz | tar xvf -
```

A temporary subdirectory `tartmp` will be created which includes the individual parts of the server. In the `tartmp` directory itself you will find `hwinsttar` – the `hwinsttar` program for the distribution you have.

HWINSTTAR COMMAND LINE OPTIONS

Now invoke the command `tartmp/hwinsttar` from `hwsystem`'s home directory to do the installation. The following parameters influence the installation process:

`-help`

This prints help on the parameters of the installation tool.

`-confirm`

This causes the installation tool to ask for confirmation before installing new files. When asked for confirmation you can answer `y`, `n` or `c` meaning *yes*, *no* or *changelog*. If you type `c` a changelog file for the appropriate file is printed to help you decide.

`-nochanges`

This causes the installation tool to check the installation and necessary updates but does not change anything.

`-changelog`

This creates a changelog file `hwinsttar.clog` in `hwsystem`'s home directory. Together with option `-nochanges` this produces a log file of the changes in the newest version compared to the currently installed server.

`-tardir`

This is the directory containing the expanded tar archive. The default is `tartmp`.

During installation `hwinsttar` asks you for the full Internet host name of your computer. Enter the official host name known to the outside world here. This host name is used for creating URLs from URNs on the fly when accessed with WWW clients.

After `hwinsttar` is finished you can remove the directory `tartmp` with all its contents by starting `rm -rf tartmp` in `hwsystem`'s home directory.

FINISHING SETUP

Follow the directions on page 31 to make necessary post-installation steps.

2.5.4 USING ORACLE WITH HYPERWAVE INFORMATION SERVER

During installation of Hyperwave Information Server, you are given the option of using either Hyperwave Information Server's native database or the Oracle database. If you decide to use Oracle, Oracle must be installed separately. See below for details.

REQUIREMENTS

Platform: The option to use the Oracle database with Hyperwave is currently available for Sun Solaris 2.5.1 and Windows NT.

Oracle 8 database server: Oracle 8.0.3 (or higher) must be installed **before** you install the Hyperwave Information Server, and the tablespaces necessary for Hyperwave must have been created (see below).

Oracle database user: Because Hyperwave needs to have access to the Oracle server, you must create an Oracle user for Hyperwave. This user must have the proper access rights to put data into the tablespaces.

Oracle 8 client: The Oracle client software (version 8.0.4.x.x or higher) must be installed on the computer on which you are planning to install the Hyperwave Information Server. Hyperwave and

the Oracle client do not necessarily have to be installed on the same computer where the Oracle server is installed, however, for performance reasons it is recommended.

USER

The user under whom the Hyperwave Information Server is running (usually hwsystem) should have access to the correct environment for Oracle. This user must have access to the Oracle 8 database server. The following variables are of particular importance:

- ORACLE_SID
- ORACLE_HOME
- LD_LIBRARY_PATH

Further details can be found in the platform-specific Oracle installation guide.

STARTING THE HYPERWAVE SERVER

When you start your Hyperwave Information Server with Oracle for the first time, only the WaveSetup configuration tool and not the server itself is started. At this time, certain parameters of the Oracle database must be configured. See page 33 for details.

*Note: Never use Oracle tools such as SQL*Plus to alter the tables which the Hyperwave Server manages!*

2.5.4.1 REQUIRED TABLESPACES AND TABLES

Certain tablespaces must exist when installing Hyperwave Information Server for use with Oracle.

Tablespace	Default INITIAL	Default NEXT	Default PCTINCREASE	Default MAXEXTENTS	Size	Next Extent
HWUSERS	5M	5M	0	100	200M	100M
HWINDEX	3M	3M	0	100	150M	50M
HWLOB	200M	50M	0	100	500M	50M

If necessary, these names can be changed. If you do this, you will have to make changes in your `.db.contr.rc` file to the following variables:

```
WAVEORACLE::USER_TABLESPACE_NAME
WAVEORACLE::INDEX_TABLESPACE_NAME
WAVEORACLE::LOB_TABLESPACE_NAME
```

The space reserved for Hyperwave thus initially takes up about 800 MB of hard disk space. Because most tables derive their parameters from the tablespaces, the default storage parameters of the tablespaces are very important.

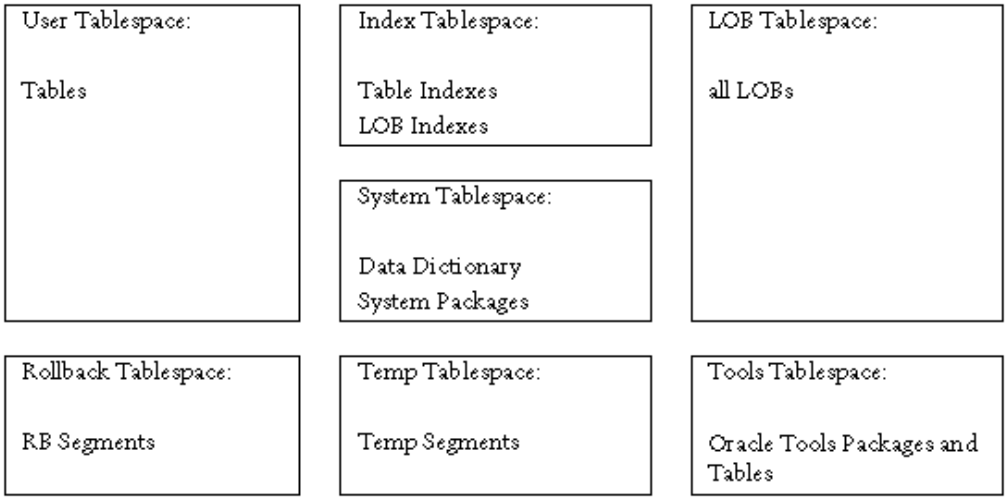


Figure 12: Recommended tablespace layout when using Hyperwave with Oracle

Figure 12 shows the recommended tablespace layout when using Hyperwave with Oracle. For performance reasons, the tablespaces should be divided among the hard disks as described on page 29.

Tables	PCTFREE	PCTUSED	INITIAL	NEXT	PCTINCREASE	MAXEXTENTS (*)
HWANCHORTABLE	4	93	TS def.	TS def.	TS def.	TS def.
HWCONTAINERTABLE	4	93	TS def.	TS def.	TS def.	TS def.
HWDOCUMENTTABLE	4	93	TS def.	TS def.	TS def.	TS def.
HWLINKTABLE	4	93	TS def.	TS def.	TS def.	TS def.
HWVERSIONTABLE	4	93	TS def.	TS def.	TS def.	TS def.
HWDOCUMENTREPOSITORY	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP	30	40	100	100	0	TS def.
HWOBJECTSOUP_TS	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_TS_U	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_U32	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_U32_U	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_U64	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_U64_U	4	93	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_VC	Oracle def.	Oracle def.	TS def.	TS def.	TS def.	TS def.
HWOBJECTSOUP_VC_U	Oracle def.	Oracle def.	TS def.	TS def.	TS def.	TS def.

Oracle def. = Oracle default
TS def. = Tablespace default

Note: *The values marked in gray are the only values that can or should be changed by the server administrator.*

ORACLE SYSTEM PARAMETERS

The following values are recommended for configuring the Oracle system parameters:

Temp Tablespace: Datafilesize=5MB;Autoextend on;Maxsize=100MB;NextExtent=5MB

Rollback Tablespace: Datafilesize=100MB; Autoextend on; Maxsize=200MB; Nextextent=10MB; Optimal=25MB

Rollback Segments: 4 segments with an initial size of roughly 20MB

Note: *If you are expecting very large indexes, you may have to increase the Maxsize of the Temp Tablespace. Or, if you are upgrading the Oracle server, and the data sets on the old server are very large (greater than 100MB) you should periodically check the Storage Manager during the upgrade process in order to see if the tablespaces still have space.*

HARD DISK CONFIGURATION

It is possible to use one hard disk for all the tables, however, for performance reasons it is recommended to distribute the tablespaces on five hard disks as described below.

- ♦ These entries must be on the specified hard disk
- ➢ These entries can be on a disk other than the one specified

Hard Disk 1

- ♦ User Tablespace
- ♦ LOB Tablespace
- ♦ Control File 1
- ➢ Tools Tablespace

Hard Disk 2

- ♦ Index Tablespace
- ♦ Control File 2
- ➢ Temp Tablespace

- Temporary Space for Backup and Data Compression

Hard Disk 3

- System Tablespace
- Control File 3
- Rollback Tablespace

Hard Disks 4 and 5 (mirrored)

- Archive logs
- Hot Backup
- Misc. (tar directory, etc.)

2.5.4.2 DELETING DATA FROM A PREVIOUSLY INSTALLED ORACLE SERVER

If you are using Hyperwave with a previously installed Oracle database which contains data and you would like to delete this data, you must drop all tables Hyperwave Information Server creates, as well as the `HWObjectSoup_REGISTRY.inf` file, which is in the `waveoracle` directory. If you then restart the server, it will create a new, empty Hyperwave database. Also, a new system user with the default system password will be created.

2.5.4.3 TOOLS FOR CONVERTING BETWEEN HYPERWAVE INFORMATION SERVER AND ORACLE

GENERAL GUIDELINES

The source data is not deleted by the tools (you may delete it manually).

HWNATIVE2ORACLE

`hwnative2oracle` converts an existing Hyperwave Information Server database to Oracle. This is done as follows:

1. Stop the server using `hwstop`.
2. Check for a file called `DBOK` in the `wavestore` directory. If it exists, the database is in a consistent state and can be converted.
3. Install Hyperwave Information Server using option "Oracle database" (see the requirements for Oracle installation in section 2.5.4.
4. Configure Oracle settings in WaveSetup.
   a) execute `hwstart` (only `hwservercontrol` is started)
   b) use WaveSetup (see the Hyperwave Administrator's Guide)
   c) do not restart the server (use `hwstop`)
5. If it exists, delete the file `HWObjectSoup_REGISTRY.inf` (in `waveoracle` directory)
6. Start `hwnative2oracle` in the home directory of the Hyperwave Information Server.

WARNING: All data belonging to the Oracle Account that Hyperwave uses to access Oracle will be destroyed during the conversion process (HWIS data in Oracle database). Data belonging to other users, whether it resides in the same instance or not, will not be affected by the conversion.

HWORACLE2NATIVE

`hworacle2native` converts an existing Oracle database to a Hyperwave database. This is done as follows:

1. Stop the server using `hwstop`.
2. Install Hyperwave Information Server using option "native database".
3. If it exists, delete file `HWObjectSoup_REGISTRY.inf` (in `wavestore` directory)
4. Start `hworacle2native` in the home directory of the Hyperwave Information Server.

WARNING: All data residing on the target Hyperwave instance (directories `wavestore` *and* `dcserver`*) will be destroyed during the conversion process.*

2.5.5 WHAT IS DONE WITH MY OLD PLACE TEMPLATES?

With version 2.6 and above of Hyperwave, the new PLACE templates are no longer installed directly in the `wavemaster` directory, but rather in a directory named after the version number. For example, for version 4.0, the PLACE include files are found in the directory `wavemaster/v4.0/include` instead of in `wavemaster/include`. If you make an upgrade to version 4.1, the 4.0 templates are saved in a time-stamped directory.

2.5.6 FINISHING SETUP

The following post-installation steps must be taken regardless of which installation method you used.

HGBINDPORT

In order to make it possible for the server to use ports below 1024 such as port 80 for WWW and port 418 as the native Hyperwave port, the program `hgbindport` must be in the proper directory and must run as root. This tiny program is the only piece of the whole server that needs to run as root. All the others run under the normal `hwsystem` account for security reasons.

This program is available in an already compiled version on the CD as `/unix/`<*your architecture*>`/hgbindpo.rt`. However, since system operators do not normally trust programs running with root permission, this code is also distributed as C source code. The file `hgbindport.c` is found in the subdirectory samples in the home directory of `hwsystem` and can be compiled by the system administrator if he or she doesn't want to use the precompiled version. If you have GNU C installed on your computer, compilation would be started as:

```
gcc -o hgbindport hgbindport.c
```

This particular command works for most but not all platforms. To find out how to compile `hgbindport.c` for your platform, see the README file on the Hyperwave CD, which is found at <*path_to_cd*>`/unix/`<*your_architecture*>`/readme.txt`. Once `hgbindport` is compiled (whether you used the pre-compiled version or compiled it yourself) you have to `su root`, move `hgbindport` to the executable subdirectory of the server (`~hwsystem/bin/`<*your architecture*>), `chown root hgbindport` and set the setuid bit by executing `chmod 04755 hgbindport`.

RELOADING .CSHRC

Before going any further with configuration or even starting the server make sure you have reread `.cshrc` by either calling `source .cshrc` in `hwsystem`'s home directory or by logging out and in again.

Rereading `.cshrc` is necessary because the installation process modifies `.cshrc` so that `.hgrc` is included at the end of it. In `.hgrc` some environment variables are set that are needed for server operation.

MAKING SURE YOUR SERVER RUNS CONTINUOUSLY

In order to keep the Hyperwave Information Server running all the time you should add the following lines to your local boot script (for example `/etc/rc.local`):

```
# Start Hyperwave Information Server
if [ -x /your_hw_dir/bin/scripts/hwstart ]; then
echo 'Starting Hyperwave Information Server' >/dev/console
su - your_hw_usr /your_hw_dir/bin/scripts/hwstart
```

```
fi
```

2.5.7 STARTING AND STOPPING THE SERVER

Once you have installed Hyperwave Information Server, you can start it by logging in as `hwsystem` and executing the program `hwstart`. Use the command `hwstop` if you want to stop the server. Both are located in `$HOME/bin/scripts`.

Note that it is not necessary to stop the server during a shutdown. However, you must make sure that your system shutdown mechanism leaves enough time between the TERM and the KILL signal because a Hyperwave Information Server may need up to several minutes (depending on the size of the server) in order to stop in a consistent state.

If you want to (or have to) kill single server processes by hand, do not kill them using SIGKILL if not absolutely necessary. If you do, the processes have no chance to receive the signal and react on it. This results in having to reorganize internal database structures to reach a consistent state, which may take time.

When `hwstart` is executed, the following events occur:

- `hwservercontrol` is started. This program is the watchdog for the whole server. After having started `hwservercontrol` the `hwstart` script terminates and passes control to the watchdog.
- `hwservercontrol` checks the license file. If the license is not valid, e.g. it has expired, the server is started in "setup only" mode, meaning that the only part of the server which is started is WaveSetup.
- `hwservercontrol` parses the file `.db.contr.rc` (Hyperwave Information Server's configuration file) in the home directory of `hwsystem` and creates the necessary scoped server process environments.
- After having created all necessary scoped environments the single parts of the server are started.
- Some parts of the server may have to reorganize internal data structures if they did not terminate cleanly, for example if they were terminated using SIGKILL instead of SIGTERM. Time for reorganization of different parts of the server is heavily dependent on the server's size and on the amount of data. Under normal conditions only a quick scan of the internal structures is performed.

If you have trouble starting the server, look at the log file for `hwservercontrol` (`~hwsystem/log/server.log`) for information on which server process could not be started. You can then look at the log file corresponding to that process. Also refer to the chapter on troubleshooting in the *Hyperwave Administrator's Guide*, where common problems and their solutions are described.

USER NAME AND PASSWORD

After Hyperwave Information Server is installed, there is one user account on the server. This user belongs to the group of system administrators ("system") and thus this user has rights to edit all information on the server and create new users and groups. For more information on how to create new user accounts see *The Hyperwave Administrator's Guide*.

The user name and password for the account depend on certain conditions:

1. In most cases, the user name and password are taken from the UNIX account under which Hyperwave Information Server was installed.

2. In the case of UNIX systems with shadow passwords, the password field in `/etc/passwd` cannot be read, and thus the password of the UNIX account cannot be used. In this case, the user name is taken from the account and the password is "hwsystem". For security reasons it is recommended to change the password as soon as possible by selecting **Site→Change Password**.

STARTING INFORMATION SERVER WHEN USING ORACLE

If you are starting the server for the first time using the Oracle database, `hwservercontrol` will notice that Oracle has not yet been configured and will start in setup only mode, allowing you to configure Oracle with WaveSetup. You must configure the parameters explained below for Oracle because the Hyperwave Information Server needs these parameters for startup.

ORACLE PARAMETERS IN WAVESETUP

It is possible to configure several parameters associated with the Oracle database in WaveSetup. These parameters are found on the **Database** page in the tool, which only appears when using Hyperwave with Oracle:

- The user name of the Oracle user (required)
- The password of the Oracle user (required)
- **DB String**: This is required if you are not connecting to the default data base (name of appropriate TNS entry).
- The PCTFREE, PCTUSED, INITIAL, NEXT and PCTINCREASE parameters for the HWOBJECTSOUP table.

When you are finished with configuration, restart the server by clicking on the "Restart Server Now" button in WaveSetup or by entering `hwstart –force` in the command line.

2.5.8 CONFIGURING THE UNIX SERVER

Hyperwave Information Server is configured using the WaveSetup tool (see *Hyperwave Administrator's Guide* for more information on configuring the server). To use it, do the following:

1. Connect to your server with a Web browser on port 9999, e.g. `http://intranet.myserver.com:9999`.
2. The WaveSetup tool appears and you can use it to configure your server. When you are finished, you must stop and start the server before the changes take effect.

WAVESETUP USER NAME AND PASSWORD

The user name and password for WaveSetup depend on certain conditions:

1. In most cases, the user name and password are taken from the UNIX account under which Hyperwave Information Server was installed.
2. In the case of UNIX systems with shadow passwords the password field in `/etc/passwd` cannot be read, and thus the password of the UNIX account cannot be used. In this case, the user name is taken from the account and the password is "hwsystem". For security reasons it is recommended to change the password as soon as possible using WaveSetup.

Note: The user name and password for the server and WaveSetup are completely independent, i.e. changing one does not change the other.

CONFIGURATION FILE

The server can also be configured by directly editing the configuration file `.db.contr.rc`. This file is found in the directory where you installed Hyperwave. For a detailed explanation of the variables in this file, see *The Hyperwave Administrator's Guide*.

2.5.9 THE DEMO DATA SET

Hyperwave comes with a demo data set which you can optionally upload to the server. The file `tutorial.hif`, which contains this data, is on the CD in the `manual` directory.

To get the information into a Hyperwave Information Server use the `hifimport` command as shown below.

`$ hifimport -hghost` *<name_of_HWIS>* `-overwrite replace` *<name_target_collection>* *<path_to_CD>*`/manual/tutorial.hif`

During the import you are asked for a user name and password. Enter a user who has enough access rights to the target collection to insert the documents. After the import you will find the documents in the specified target collection.

After inserting the data you will find a welcome page in the specified target collection containing a link "Hyperwave Demonstration Program". If you follow this link the tutorial is started.

Inserting the demo data into the root collection of an empty server provides you a with a nice startup document when you connect to this server. To insert the demo data in a new server as startup point type:

`$ hifimport -hghost` *<name_of_HWIS>* `-overwrite replace rootcollection` <path_to_CD>`/manual/tutorial.hif`

Identify as system user during the insertion.

To remove the auto display document from the parent collection just remove the startup document from the parent/root collection.

2.5.10 SUPPORT

The Hyperwave support team can be contacted through our Web site, by email, or by telephone.

WEB SITE We provide a contact form where you can submit structured requests to our support experts at the following addresses:

USA: `http://www.hyperwave.com/support/helpdesk`

Germany: `http://www.hyperwave.de/support/helpdesk`

EMAIL You can also direct your questions and comments to us by email. Email should be used if you want to submit log files and other data that will help us while analyzing problems.

USA: `support@hyperwave.com`

Germany: `support@hyperwave.de`

TELEPHONE Call to discuss your wishes personally with one of our specialists at the following numbers:

USA: 1-888-644-3100

Germany: +49 89 993074-33

3 APPENDIX A

3.1 HYPERWAVE COPYRIGHT NOTES

The software on this CD is copyright protected. Some packages like Perl are protected by the GNU public license. This license requires the inclusion of the source code for the distributed packages. For these programs the source code can be found in the "<*path_to_CD*>`/unix/src`" directory, the source code includes also the exact text of the license.

In addition this CD contains the Acrobat Reader from Adobe to display the PDF documentation. The official copyright statement follows:

Acrobat © Reader Copyright © 1987-1996 Adobe Systems Incorporated.

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Hyperwave is the trademark of Hyperwave Software Inc., the Hyperwave logo is a trademark of Hyperwave Information Management GmbH. Hyperwave Information Server, Copyright 1998 Hyperwave Information Management, GmbH. All rights reserved.

3.2 NETSCAPE COPYRIGHT STATEMENT

Portions © Netscape Communications Corporation 1996, All Rights Reserved

4 APPENDIX B

4.1 RELEASE CHANGES 4.1

4.1.1 CHANGES TO THE SERVER

- Using Oracle with Hyperwave Information Server
  - The Oracle 8.0.4.x.x client software is required instead of 8.0.3 when using Oracle with Hyperwave.
- Release Procedures (Workflow)
- New user interface
  - Dialogs which are used to alter information on the server now appear in separate browser windows.
  - After a search the first ten results are displayed with a link to further results.
  - Guest (anonymous) users, as well as identified users who have not switched to “authoring” mode are in “view mode”, in which no menus can be pulled down. Only HTML and no JavaScript is used in this mode, thus significantly increasing interface speed.
  - New, more intuitive menu structure.
- Performance enhancements

4.1.2 CHANGES TO THE CLIENT

- ODMA
  - It is now possible to upload documents of type plain text and HTML with Microsoft Word and give them the correct MimeType attribute. It was previously only possible to upload Word documents.
  - Document language can be selected from a list rather than entering a language prefix as was previously the case.
- Virtual Folders
  - Documents can be checked in/checked out recursively.
  - Object attributes can be modified recursively.
  - Keyboard support for drag and drop.
  - Drag and drop works between different Explorer windows.
  - Firewall proxy support has been added.
  - Load and save functionality in combination with spooler exists for all applications which use the common dialog for load and save.

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