

## **Welcome to the Microsoft Exchange Server Performance Optimizer**

The Microsoft Exchange Server Performance Optimizer analyzes

- How this Microsoft Exchange Server computer will be used.
- Your hardware and memory resources.

Using the above information, the Performance Optimizer

- Recommends and/or moves files to optimize disk access.
- Recommends and/or changes system parameters to achieve optimum performance of your Microsoft Exchange Server services.

To perform these tasks, the Performance Optimizer stops all Microsoft Exchange Server services. No Windows NT Server services or other programs will be affected. You can restart all services automatically at the end of this process.

**Note** For more information about optimizing the performance of your Microsoft Exchange Server computer, see the *Microsoft Exchange Server Resource Guide*.

## How Will You Use Microsoft Exchange Server?

The information you enter on this screen is used to optimize the services and load expected for this server.

**Note** If you change how you use this server, or if you change the hard drives or memory available, you should rerun the Performance Optimizer for the new configuration.

### Number of Users on this Server

Select the maximum number of users you expect to be logged onto the server concurrently.

### Type of Server

Select all that apply.

<u>Choose this server type</u>	<u>If you are using this server to</u>
Private Store	Store user mailboxes.
Public Store	Store public folders.
Connectors	Connect two Microsoft Exchange Server computers together, as a backbone or bridgehead, by using Site Connectors.
Directory Import	Bulk import or export directory information.
Multiserver	Connect to other servers and/or connectors. Do not turn off this option unless this server will only be connected to clients.
IMAP4/POP3/NNTP only	Host only Internet Message Access Protocol, Version 4rev1 (IMAP4), Post Office Protocol version 3 (POP3), and/or Network News Transfer Protocol (NNTP) clients. Do not select this option if your server hosts Messaging Application Programming Interface (MAPI) clients.

### Number of Users in Organization

Select the total number of users you expect to be supported by all Microsoft Exchange Server computers in your organization.

### Limit Memory Usage

You can limit the amount of memory that Microsoft Exchange Server can access, to free memory for other applications running on the server. To limit the amount of memory available to Microsoft Exchange Server, type the total amount of memory you want to allocate to Microsoft Exchange Server. The value should be 24 MB or more; 32 MB or more is recommended. By default, Microsoft Exchange Server has access to all of the available RAM on the server.

**Warning - Only One Suitable Drive Available**

Microsoft Exchange Server performs optimally on a multidrive computer, where services can be grouped according to their disk access patterns and can run concurrently. Microsoft Exchange Server will run on a single-drive computer, but performance may be reduced.

## **Skip Disk Analysis**

The Performance Optimizer analyzes your hard disk drives to determine the best locations for Microsoft Exchange Server files. Note that the Performance Optimizer only recognizes logical drives, which may be composed of physical drives.

### **Analyze Hard Disks**

Clear the **Analyze Hard Disks** check box to skip disk analysis. Skipping the disk analysis also prevents the Performance Optimizer from suggesting file moves that can improve Microsoft Exchange Server performance. However, the Performance Optimizer can still set other parameters without analyzing the disks.

You can move files manually later in this procedure.

### **Drive List**

This box lists the logical drives available on the server with the amount of free and total space on each drive.

Double-click a drive or select a drive and press the SPACEBAR to toggle between excluding it from the disk analysis and file moving suggestions or including it.

**Note** Drives that don't have enough free space will be excluded by default.

## **Disk Analysis**

The Performance Optimizer analyzes your hard disk drives to determine the best locations for Microsoft Exchange Server files. This test analyzes disks simultaneously to determine which drives provide the best performance for different Microsoft Exchange Server service data files. The analysis uses a test file in available space on the drive to test the speed of:

- Sequential access (write data sequentially)
- Random access (write/read data randomly)

The Performance Optimizer takes the average access times, writing and reading large amounts of data, so the test may take some time. This test does not affect your hard drive contents.

## Disk Analysis Results

This window displays the performance results for the disk analysis. The time is listed in milliseconds (ms). Smaller numbers mean better average access times, and numbers are only significant in relation to the other drives' access times.

RA Average time for random disk access

Seq Average time for sequential disk access

**Note** If a drive is listed as "Not Analyzed," it was either excluded previously, or an error occurred during analysis.

## Suggested File Moves

The Performance Optimizer suggests file moves based on your hardware configuration and how you indicate the server will be used. The Microsoft Exchange Server files are listed with their current location and a suggested location.

After choosing **Next**, you will be prompted to verify that you want the moves to take place.

**Note** If you disabled the disk analysis, the current location and suggested location are the same. You can manually change the suggested location by specifying a new path and meeting the following criteria.

### Changing the Suggested Locations

To avoid errors during file transfer:

- Make sure that your destination directories are empty.
- Specify separate directories for the directory service and information store log files.
- Specify a unique directory for the message transfer agent (MTA) log files.
- Do not specify network or non-fixed (floppy) drives.

## Verify File Moves

The **Move files** check box is selected by default. Choose **Next** to move files and update their locations.

Clear the check box to leave files where they are.

**Note** If you want to move files later, run the Performance Optimizer so that the file locations are correctly registered with Microsoft Exchange Server services.

If this operation is interrupted, changes are not saved.

If a set of files cannot be moved due to insufficient disk space or other file errors, the Performance Optimizer continues to move the rest of the files.



## **System Parameters**

This screen displays the parameter values that the Performance Optimizer has determined will provide optimum performance. Although you can change the values, doing so may adversely affect the performance of Microsoft Exchange Server.

If you change the values and want to reset them to the defaults, rerun the Performance Optimizer.

## Restart Services

The Performance Optimizer has completed file transfers and registered their new locations with the Microsoft Exchange Server services. You still can cancel to leave the remaining Microsoft Exchange Server parameters unchanged.

### Restarting Services

The **Restart Services** box lists the services that were stopped when you started the Performance Optimizer. Choose **Finish** to restart these services and save the Microsoft Exchange Server parameter settings.

Select the **Do not restart these services** check box if you want to restart the services manually later. For information about manually starting and stopping Microsoft Exchange Server services, see *Microsoft Exchange Server Operations*.

### Performance Optimizer Log

The Performance Optimizer log file includes information that can be used to track changes made to your server and to report problems. Each time you run the Performance Optimizer, log entries are appended to this file.

## Customized Performance Optimizer Settings

You can customize Performance Optimizer settings by typing **perfwiz -v** at the command prompt in the Exchsrvr\Bin directory. When you run **perfwiz -v**, the Performance Optimizer displays additional screens that provide the following options.

<b>Option</b>	<b>Description</b>
<b># of information store buffers</b>	The maximum number of 4KB buffers allocated to the information store database.
<b># of directory buffers</b>	The maximum number of 4KB buffers allocated to the directory store database.
<b>Minimum # of information store threads</b>	The minimum number of threads that the information store will use to service Messaging Application Programming Interface (MAPI) clients, such as Microsoft Outlook.
<b>Maximum # of information store threads</b>	The maximum number of threads that the information store will use to service MAPI clients, such as Microsoft Outlook.
<b># of directory threads</b>	The maximum number of threads used by the directory.
<b>Maximum # of concurrent read threads</b>	The maximum number of directory threads available to service replication requests.
<b># of background threads</b>	The number of threads available for background tasks and to the Gateway In/Out and Send and Delivery thread pool.
<b># of heaps</b>	The number of areas of memory used for dynamic memory allocation.
<b># of private information store send threads</b>	The number of threads that process messages submitted by MAPI clients, such as Microsoft Outlook.
<b># of private information store delivery threads</b>	The number of threads that the private information store can use to deliver messages to mailboxes.
<b># of public information store send threads</b>	The number of threads that process public folder replication messages and messages generated by public folder rules.
<b># of public information store delivery threads</b>	The number of threads that the public information store can use to deliver messages to public folders.
<b># of information store gateway in</b>	The number of information store

<b>threads</b>	threads that deliver mail from the message transfer agent (MTA) to the information store for routing elsewhere. For optimal performance, the number of threads should be increased only if the server has multiple processors.
<b># of information store gateway out threads</b>	The number of information store threads delivering mail from the information store to local mailboxes, or to the MTA. For optimal performance, the number of threads should be increased only if the server has multiple processors.
<b>Buffer Threshold Low Percent</b>	The percentage of available buffers remaining before buffers are flushed to disk. Lower values limit the number of writes to disk; however, low values can degrade performance.
<b>Buffer Threshold High Percent</b>	The percentage of available buffers that must be reached before flushing of buffers to disk stops. For optimal performance, set the percentage value equal to, or slightly greater than, the Buffer Threshold Low Percent.
<b>Maximum # of pool threads</b>	The maximum number of threads servicing Internet connections such as Internet Message Access Protocol, Version 4rev1 (IMAP4), Post Office Protocol version 3 (POP3), and Network News Transfer Protocol ( NNTP) into the information store. This value is per processor.
<b># of information store users</b>	The number of users for which this server will route mail.
<b># of concurrent connections to LAN-MTAs</b>	The number of concurrent network associations to MTAs.
<b># of concurrent connections to RAS LAN-MTAs</b>	The minimum number of concurrent network associations to Remote Access Service (RAS) MTAs.
<b># of LAN-MTAs</b>	The minimum number of network MTAs supported by the MTA.
<b># of X.400 gateways</b>	The maximum number of remote MTAs connecting through X.400 using X.25, Transport Control Protocol/Internet Protocol (TCP/IP), or Transport Class 4 (TP4).
<b>ds_read cache latency (secs)</b>	The number of seconds before the directory service read cache expires.

	Performance improves when items are loaded in the cache by limiting the number of directory service reads.
<b># of dispatcher threads</b>	The total number of threads used to route messages.
<b># of transfer threads</b>	The total number of threads used to transfer messages.
<b># of kernel threads</b>	The total number of threads allocated to process the Open Systems Interconnection (OSI) protocol stack.
<b># of submit/deliver threads</b>	The total number of MTA submit and deliver threads.
<b># of RAS LAN-MTAs</b>	The maximum supported number of concurrent network associations to other RAS MTAs.
<b># of database data buffers per object</b>	The number of 4KB buffers configured per cached MTA database file. The MTA saves a copy of each message until the message has been accepted by the information store, or another MTA.
<b># of RTS threads</b>	The total number of threads available to the Reliable Transfer Service (RTS) level of the OSI protocol stack.
<b># of concurrent MDB/delivery queue clients</b>	The maximum number of information store and XAPI MA delivery queue clients supported. Each client can have more than one session. For optimal performance, the value should be at least two, to support both the public and private databases.
<b># of concurrent XAPI sessions</b>	The maximum number of sessions to information store and XAPI MA delivery queue clients, XAPI MA retrieval queue clients, and XAPI MT gateway clients.
<b>Max # of RPC calls outstanding</b>	The maximum number of concurrent remote procedure call (RPC) threads. This limits the maximum number of RPCs that will be processed at one time.
<b>Min # of RPC threads</b>	The minimum number of concurrent RPC threads. This sets the minimum number of RPCs that will be processed at one time.
<b># of MT gateway clients</b>	The maximum number of XAPI MT gateway clients supported, which is the maximum number of gateways the MTA can support.

<b># of retrieval queue clients</b>	The maximum number of XAPI MA retrieval queue clients supported.
<b># of TCP/IP control blocks</b>	The maximum number of TCP/IP connections supported.
<b># of TCP/IP threads</b>	The maximum number of MTA DMOD threads processing TCP/IP connections.
<b># of TP4 control blocks</b>	Maximum number of supported concurrent TP4 connections.
<b># of TP4 threads</b>	Maximum number of MTA DMOD threads processing TP4 connections, including multiple thread connections.

If the Internet Mail Service is already installed, the following options will also appear:

<b>Option</b>	<b>Description</b>
<b># of inbound threads</b>	The number of threads available to perform content conversion and move inbound mail from the Internet Mail Service to the information store.
<b># of outbound threads</b>	The number of threads available to perform content conversion and move outbound mail to the Internet Mail Service and from the information store.
<b># of InOut threads</b>	The number of threads available to perform content conversion and move both inbound and outbound mail between the Internet Mail Service and the information store.
<b># of threads per processor</b>	The number of threads available for traffic between the Internet Mail Service and the Internet.

