

VisualAge Smalltalk



# Installation Guide

*Version 5.5.2*

**Note**

Before using this document, read the general information under "Notices" on page v.

**May 2001**

This edition applies to Version 5.5 of the VisualAge Smalltalk products, and to all subsequent releases and modifications until otherwise indicated in new editions. Make sure you are using the correct edition for the level of the product. The term "VisualAge", as used in this publication, refers to the VisualAge Smalltalk product set.

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## About this book

This book guides you through installing VisualAge Smalltalk and its associated features.

This book also covers setting up a team development environment, including information on setting up and using EMSRV, the library management server.

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## Who this book is for

This book is written for anybody who needs to install VisualAge Smalltalk. It is also intended for administrators, or anyone who might be maintaining the library server for a team development group.

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## Conventions used in this book

This book uses conventions that you might not have seen in other product manuals.

These highlighting conventions are used in the text:

Highlight style	Used for	Example
Boldface	New terms the first time they are used	VisualAge uses <b>construction from parts</b> to develop software by assembling and connecting reusable components called <b>parts</b> .
	Items you can select, such as push buttons and menu choices	Select <b>Add Part</b> from the <b>Options</b> pull-down. Type the part's class and select <b>OK</b> .
<i>Italics</i>	Special emphasis	Do <i>not</i> save the image.
	Titles of publications	Refer to the <i>VisualAge Smalltalk User's Guide</i> .
	Text that the product displays	The status area displays <i>Category: Data Entry</i> .
	VisualAge programming objects, such as <i>attributes, actions, events, composite parts, and script names</i>	Connect the window's <i>aboutToOpenWidget</i> event to the <i>initializeWhereClause</i> script.
Monospace font	VisualAge scripts and other examples of Smalltalk code	<pre>doSomething   aNumber aString   aNumber := 5 * 10. aString := 'abc'.</pre>
	Text you can enter	For the customer name, type John Doe

---

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Please take a few moments to tell us what you think about this book. The only way for us to know if you are satisfied with our books or if we can improve their quality is through feedback from customers like you. A reader's comment form is available on our VisualAge Smalltalk Web site.



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## What's New in Version 5.5 Installation

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### Graphical User Interface

The look and feel of the install program has changed somewhat since version 5.0. Please refer to the installation instructions for your operating system for steps on how to install.

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### Installation Manager

In past VisualAge Smalltalk installs it was necessary to separately install your .dat files based on the which features you added to the base install. Version 5.5 supports pre-importing feature code libraries at install time so that this is no longer necessary, all the .dat files are automatically loaded at the same time the feature is installed.

---

### Synchronization of the Library Manager and Client

In Version 5.0, the .ctl files on the Client determined what you could view in the Load/Unload dialog. In Version 5.5, this has changed; the Library Manager now determine what you will view in the Load/Unload dialog. This change makes it essential for you to keep your Client code in sync with the code installed on the Library Manager.

For example, Mary installs UML designer on the Manager and John installs just the base client. In the load/unload dialog, John sees that UML classes are available for loading and does so. The load of the classes will work correctly. When John attempts to use the UML designer classes, he will encounter unpredictable results due to missing files such as mprs, cats, dlls, etc.

For optimum performance it is ideal that your manager and client installations have the same features loaded. Please see your system administrator in order to determine which features have been loaded onto the manager.



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## What's New in Version 5.5.2 Installation

VisualAge Smalltalk Enterprise Version 5.5.2 is a refresh of VisualAge Smalltalk Enterprise Version 5.5 and includes fixes to known defects, along with several enhancements. See the readme file for additional details.

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### Updated Select Features Page

If you have previously installed VisualAge Smalltalk Version 5.5 or 5.5.1, the Select Features page will display a + and a number to the right of each feature in order to indicate Version 5.5 or 5.5.1 features that were previously installed and the approximate size difference of the feature in VisualAge Smalltalk Version 5.5.2.

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### Verify Development Manager Page

If you have previously installed VisualAge Smalltalk Version 5.5 or 5.5.1 Manager and are installing VisualAge Smalltalk Version 5.5.2 Manager, the Verify Development Manager page appears. You must verify or type the hostname or manager library path of the manager that you wish to update. A second Verify Development Manager screen then appears. You must ensure that you have backed up the Development Manager library and check the **I have backed up my manager library** box.

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### New Directories and Startup Option

After installing VisualAge Smalltalk Version 5.5.2 Client, you will have three new directories; icsrn552, icspk552, and image552.

You will also have a new program link for the IBM VisualAge Smalltalk Enterprise Client Development Image 5.5.2.

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### IBM Smalltalk Image Provided

You are no longer required to build your own IBM Smalltalk Image. Version 5.5.2 provides a prebuilt IBM Smalltalk image:

#### **Windows and OS/2**

On Windows and OS/2, the image is <vast>\newimage\ibmst.icx

**UNIX** On UNIX, the image is /opt/IBMvast/5.5/newimage/ibmst.icx



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## Chapter 1. Installing VisualAge Smalltalk

This chapter guides you through installing VisualAge Smalltalk on Windows, OS/2, and UNIX platforms. If you are migrating from a previous version of VisualAge Smalltalk, please refer to the *VisualAge Smalltalk Migration Guide* before starting the installation.

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### Installing VisualAge Smalltalk Enterprise Version 5.5.2

**Note:** If you have previously installed VisualAge Smalltalk Enterprise Version 5.5, the directories `icsrun`, `icspkg`, and `image` will not be overwritten. However, the contents of other directories may be overwritten. You should backup any files you may need from the other directories.

**Note:** If you have previously installed VisualAge Smalltalk Enterprise Version 5.5.1, the directories `icsrn551`, `icspk551`, and `image551` will not be overwritten. However, the contents of other directories may be overwritten. You should backup any files you may need from the other directories.

For VisualAge Smalltalk Version 5.5.2, you do NOT need to install VisualAge Smalltalk Version 5.5 or 5.5.1 before you install Version 5.5.2. Version 5.5.2 determines if Version 5.5 or 5.5.1 is installed on your machine and does one of the following:

- If Version 5.5 or 5.5.1 was previously installed, the Version 5.5.2 installation upgrades the software to Version 5.5.2. The Version 5.5.2 code is merged into the Version 5.5 or 5.5.1 manager.
- If neither Version 5.5 or 5.5.1 was previously installed, the Version 5.5.2 installation performs a full software install of Version 5.5.2.

### Overview of installation

There are two pieces to the installation of VisualAge Smalltalk: the library manager and the client. The library manager is the repository that holds all of your Smalltalk code. The client consists of visual programming tools and communication links to the server where the library manager is installed.

To install VisualAge Smalltalk in a team development environment, a system administrator should install the library manager on a network attached server computer. The individual developers can then install the client code locally on their machine and connect to the library manager using EMSRV. When you install VisualAge Smalltalk this way you will be asked during installation to specify the name of the server and the location where the library manager is installed on the server.

If you are working independently of other developers you can install both the library manager and the client code on one machine, and connect from the client to the manager using file I/O access. This is also referred to as a standalone installation.

**Note:** It is recommended that you install the library manager before installing the client.

## Downloading VisualAge Smalltalk Enterprise Version 5.5.2

See the readme file for information on downloading VisualAge Smalltalk Enterprise Version 5.5.2 Manager and Client. You must download and install both the Version 5.5.2 manager and the Version 5.5.2 client.

**Note:** On OS/2, the Version 5.5.2 files must be unzipped to an HPFS drive because the Version 5.5.2 files contain long file names. If the files are unzipped to a FAT drive, the unzip program will not give you any error messages; however, when you run the installation program it will return errors.

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## Installing VisualAge Smalltalk Enterprise Version 5.5.2 on Windows and OS/2

**Before installing Version 5.5.2, do the following:**

1. If EMSRV is running from the directory to be updated, stop EMSRV prior to installing Version 5.5.2.
2. Stop any running VisualAge Smalltalk images.

### Installing on Windows

#### Installing VisualAge Smalltalk Enterprise Version 5.5.2 Manager on Windows

To install VisualAge Smalltalk Enterprise Version 5.5.2 Manager on Windows, run **setup.exe** from the temporary directory, i.e.

```
c:\temp\cd_m\install_w\setup.exe
```

where c:\temp is the temporary directory in which you unzipped the VisualAge Smalltalk Version 5.5.2 files.

#### Installing VisualAge Smalltalk Enterprise Version 5.5.2 Client on Windows

To install VisualAge Smalltalk Enterprise Version 5.5.2 Client on Windows, run **setup.exe** from the temporary directory, i.e.

```
c:\temp\cd_c\install_w\setup.exe
```

where c:\temp is the temporary directory in which you unzipped the VisualAge Smalltalk Version 5.5.2 files.

### Installing on OS/2

#### Installing VisualAge Smalltalk Enterprise Version 5.5.2 Manager on OS/2

To install VisualAge Smalltalk Enterprise Version 5.5.2 Manager on OS/2, run **install.cmd** from the temporary directory, i.e.

```
c:\temp\cd_m\install_o\install.cmd
```

where c:\temp is the temporary directory in which you unzipped the VisualAge Smalltalk Version 5.5.2 files.

#### Installing VisualAge Smalltalk Enterprise Version 5.5.2 Client on OS/2

To install VisualAge Smalltalk Enterprise Version 5.5.2 Client on OS/2, run **install.cmd** from the temporary directory, i.e.

```
c:\temp\cd_c\install_o\install.cmd
```

where c:\temp is the temporary directory in which you unzipped the VisualAge Smalltalk Version 5.5.2 files.

## Installing a team development library manager

The library manager holds your VisualAge Smalltalk source code. The VisualAge Smalltalk Enterprise - Library Manager should be installed before installing VisualAge Smalltalk Client. You can either install the library manager on a network server and connect using EMSRV for team programming, or you can install the library manager on your local machine and connect to the repository using File I/O access or EMSRV if it is supported on your operating system. This section covers installing a library manager on a server as a repository for team development.

When you install the manager, the .dat files which provide the additional code for the VisualAge Smalltalk features are automatically imported into your Library Manager.

To install the VisualAge Smalltalk Enterprise - Library Manager, do the following:

1. Begin installation based on your operating system's installation start-up instructions. For more information, see "Installing VisualAge Smalltalk Enterprise Version 5.5.2 on Windows and OS/2" on page 2.

**Note:** For late breaking information, click on the **Readme** push button.

2. Read the License Agreement. If you agree to the terms and conditions, select **Accept**. Otherwise, select **Decline** and exit the installation program.
3. If you have previously installed VisualAge Smalltalk Manager Library for 5.5 or 5.5.1, the Verify Development Manager Library page appears. Verify or type the hostname or IP address, and absolute path of the manager library and click **Next**. A second Verify Development Manager Library page then appears. Ensure that you have backed up your VisualAge Smalltalk Manager Library 5.5/5.5.1 and check the **I have backed up my manager library** box.
4. On the Select Features window, if you have previously installed VisualAge Smalltalk Enterprise Version 5.5/5.5.1 Manager, next to the Version 5.5/5.5.1 features that were previously installed you will see a + and a number that indicates the approximate size difference of the feature in VisualAge Smalltalk Version 5.5.2.
5. On the Select Features window, do the following:
  - a. Place a check mark in the box next to each feature you wish to install by clicking on that box. This will automatically import all of the .dat files needed to run the feature(s).

**Note:** To the right of the features list is a details window box which provides information regarding the feature.

- b. If neither VisualAge Smalltalk Manager Library for 5.5 or 5.5.1 was previously installed, check to make certain that the destination folder is correct. If you wish to change the default, click the **Browse** push button and change the location by either clicking on a new folder or directly typing the directory in the entry field. Click **OK**.
  - c. Verify that you have enough space for the installation.
  - d. Click **Next** to continue.
6. You will now be asked to complete the installation. Verify that all of the information is correct and click **Next**. The product will now install.

**Note:** Record the path where the manager is installed. Each person installing a VisualAge Smalltalk Client will need to know the path where the manager is installed and the IP address or alias of the server where the

manager is installed. For example, if you specify f:\vastv55, then the manager will be named f:\vastv55\manager\mgr55.dat.

7. When the installation is complete, click **Finish** to end the install program or **View Readme** to view the readme file.

You must set up and start EMSRV after you install the library manager. Clients cannot connect to the library manager until EMSRV is running.

### Windows NT/2000

To set up and start EMSRV for Windows NT/2000, see the following sections:

- Setting up EMSRV on Windows NT/2000
- Starting EMSRV for Windows NT/2000 from the command line
- Starting EMSRV for Windows NT/2000 as an NT/2000 service

### OS/2

To set up and start EMSRV for OS/2, see the following sections:

- Setting up EMSRV for OS/2
- Starting EMSRV for OS/2

## Installing a team development client

Before installing a VisualAge Smalltalk Enterprise Client for team development, you need to know some information about where the library manager is installed. EMSRV is used to connect to the library manager which is installed on a network server for team development. The EMSRV environment is set up during the install for the VisualAge Smalltalk Client. The library administrator should provide the following information about the VisualAge Smalltalk library manager:

- The TCP hostname or the IP address (dotted decimal address) of the server where the library manager is installed.
- The absolute path for the library manager on the server machine. The drive letter must be the drive letter **on** the server machine, not the mapped drive letter for the server machine.

To install a VisualAge Smalltalk Client do the following:

1. Begin installation based on your operating systems installation start-up instructions. For more information, see "Installing VisualAge Smalltalk Enterprise Version 5.5.2 on Windows and OS/2" on page 2.

**Note:** For late breaking information, click on the **Readme** push button.

2. Read the License Agreement. If you agree to the terms and conditions, select **Accept**. Otherwise, select **Decline** and exit the installation program.
3. On the Select Features window, if you have previously installed VisualAge Smalltalk Enterprise Version 5.5 or 5.5.1 Client, next to the Version 5.5/5.5.1 features that were previously installed you will see a + and a number that indicates the approximate size difference of the feature in VisualAge Smalltalk Version 5.5.2. On the Select Features window check off the features you wish to install by clicking the box next to the feature(s). You should not install features that you didn't also select when installing the Library Manager.

**Note:** The VisualAge Smalltalk Enterprise Client represents the base code necessary to run the client.

4. If neither VisualAge Smalltalk Client 5.5 or 5.5.1 was previously installed, check to make certain that the destination folder is correct. If you wish to



change the default, click the **Browse** push button and change the location by either clicking on a new folder or directly typing the directory in the entry field. Click **OK**.

5. Click **Next** to continue
6. If neither VisualAge Smalltalk Client 5.5 or 5.5.1 was previously installed, select **EMSRV** as the Library Access Method by which you will connect to the Library Manager. Select **Next** to continue. On the EMSRV client parameters window, do the following:
  - a. Specify the location of the server where the library manager is installed, either by specifying the hostname or IP address for the server.
  - b. Specify the fully qualified path **on the server** where the library manager is installed.  
  
For example, if the manager is installed on a machine named vastmgr in the directory f:\vastv55\manager\mgr55.dat. Even if you have vastmgr mapped as M: on your computer, you would specify f:\vastv55\manager\mgr55.dat as the path on the server where the library manager is installed.
- Note:** If you are using a shared library that resides on a network server, this path should be provided to you by your library administrator.
- c. Select **Next**.
7. If you have previously installed VisualAge Smalltalk Client 5.5 or 5.5.1, ensure that you are using the same Program Folder name. If neither VisualAge Smalltalk Client 5.5 or 5.5.1 was previously installed, choose a Program Folder name. Select **Next**.
8. Verify the information, then select **Next** to finish installing the VisualAge Smalltalk Client.
9. When the installation is complete, click **Finish** to end the install program or **View Readme** to view the readme file.
10. Reboot your system.

## Installing standalone

Installing a VisualAge Smalltalk standalone development environment consists of two steps. The first step is to install the VisualAge Smalltalk Enterprise - Library Manager. Then you install the VisualAge Smalltalk Client.

### Installing the library manager

The library manager holds your VisualAge Smalltalk source code. The VisualAge Smalltalk Enterprise Library Manager should be installed before installing VisualAge Smalltalk Client. For a standalone development environment, you install the library manager on your local machine and connect to the repository using File I/O access, or you can use EMSRV if it is supported on your operating system. This section covers installing the library manager for standalone development using File I/O access.

To install the VisualAge Smalltalk Enterprise - Library Manager, do the following:

1. Begin installation based on your operating system's installation start-up instructions. For more information, see "Installing VisualAge Smalltalk Enterprise Version 5.5.2 on Windows and OS/2" on page 2.

**Note:** For late breaking information, click on the **Readme** push button.

2. Read the License Agreement. If you agree to the terms and conditions, select **Accept**. Otherwise, select **Decline** and exit the installation program.

3. If you have previously installed VisualAge Smalltalk Manager Library 5.5 or 5.5.1, the Verify Development Manager Library page appears. Verify or type the hostname or directory of the manager library and click **Next**. A second Verify Development Manager Library page then appears. Ensure that you have backed up your VisualAge Smalltalk Manager Library 5.5/5.5.1 and check the **I have backed up my manager library** box.
4. On the Select Features window, if you have previously installed VisualAge Smalltalk Enterprise Version Manager for 5.5. or 5.5.1, next to the Version 5.5/5.5.1 features that were previously installed you will see a + and a number that indicates the approximate size difference of the feature in VisualAge Smalltalk Version 5.5.2.
5. On the Select Features window, do the following:
  - a. Place a check mark in the box next to the feature(s) you wish to install by clicking on the box next to the desired feature. This will automatically load all of the .dat files needed to run the feature(s). VisualAge Smalltalk Enterprise Library Manager represents the base code necessary to run the product.

**Note:** To the right of the features list is a details window box which provides information regarding the feature.

  - b. If neither VisualAge Smalltalk Manager 5.5 or 5.5.1 was previously installed, check to make certain that the destination folder is correct. If you wish to change the default, click the **Browse** push button and change the location by either clicking on a new folder or directly typing the directory in the entry field. Click **OK**.
  - c. Verify that you have enough space for the installation.
  - d. Click **Next** to continue.
6. You will now be asked to complete the installation. Verify that all of the information is correct and click **Next**. The product will now install.
7. When the installation is complete, click **Finish** to end the install program or **View Readme** to view the readme file.

## Installing the client

Before installing a VisualAge Smalltalk Client, you need to know some information about where the library manager is installed. For a standalone install, the library manager is installed on your local machine.

To install a VisualAge Smalltalk client, do the following:

1. Begin installation by choosing the appropriate directory from which to run your CD and run the install command based on your operating system. For more information, see "Installing VisualAge Smalltalk Enterprise Version 5.5.2 on Windows and OS/2" on page 2.

**Note:** For the latest information, click the **Readme** button at the bottom of the Welcome window.

2. Read the License Agreement. If you agree to the terms and conditions, select **Accept**. Otherwise **Decline** and exit the installation.
3. On the Select Features window, if you have previously installed VisualAge Smalltalk Enterprise Version 5.5 or 5.5.1 Client, next to the Version 5.5/5.5.1 features that were previously installed you will see a + and a number that indicates the approximate size difference of the feature in VisualAge Smalltalk Version 5.5.2. On the Select Features window check off the features you wish

to install by clicking the box next to the feature(s). You should not install features that you didn't also select when installing the Library Manager.

**Note:** You will notice on the right side of this window is a details box which provides information regarding the feature.

4. If neither VisualAge Smalltalk Manager Library 5.5 or 5.5.1 was previously installed, check to make certain that the destination folder is correct. If you wish to change the default, click the **Browse** push button and change the location by either clicking on a new folder or directly typing the directory in the entry field. Click **OK**.
5. Click **Next** to continue.
6. If neither VisualAge Smalltalk Client 5.5 or 5.5.1 was previously installed, on the Select Code Management window, select **Standalone development using File I/O**. Select **Next** to continue. Configure the File I/O connectivity. You will need to know where the manager is installed on your local drive. Select **Next**.
7. If you have previously installed VisualAge Smalltalk Client 5.5 or 5.5.1, ensure that you are using the same Program Folder name. If neither VisualAge Smalltalk Client 5.5 or 5.5.1 was previously installed, choose a Program Folder name. Select **Next**.
8. Verify the information, then select **Next** to finish installing VisualAge Smalltalk.
9. When the installation is complete, click **Finish** to end the install program or **View Readme** to view the readme file.
10. Reboot your system.

## Unlocking development products on Windows and OS/2

**Note:** Any features that were unlocked in the VisualAge Smalltalk Enterprise Version 5.5/5.5.1 image must be unlocked in the VisualAge Smalltalk Enterprise Version 5.5.2 image. Ensure that the unlock tool is pointing to the new VisualAge Smalltalk Enterprise Version 5.5.2 ini file in the image552 directory.

If you have purchased VisualAge Smalltalk Enterprise, you must unlock the product after you install. If you do not unlock the product, you will be using an evaluation version of the product, which will not let you save your image after 30 days.

To unlock VisualAge Smalltalk Enterprise, or any of the purchased features, first start the Unlock utility. Through your Start Menu/Program Files/IBM VisualAge Smalltalk Enterprise Client 5.5/5.5.1 open your **Unlock** utility. Then do the following:

1. Designate a target .ini file.

**Note:** Normally this is abt.ini in the same directory as your image. If you have copied your image and INI file to other directories, you should select **Browse** to identify the file to be unlocked.

2. Select **Next**.

The Unlock utility now lists the VisualAge Smalltalk Enterprise development products you can unlock.

3. Select the product(s) you want to unlock.

4. In the License Agreement window, select your country, then read the license. If you agree with the terms and conditions, select **Accept**.

**Note:** If you do not agree with the terms and conditions listed in the License Agreement, select **Decline** and exit the Unlock Program.

5. In the Unlock Product window, enter your License number and the Key that you received when you purchased the product.

6. Select **Unlock**.

The Unlock utility confirms that the product is unlocked or provides hints on why the product isn't unlocked.

You must unlock each product you have purchased. If you load an evaluation feature into your image, even if you have unlocked VisualAge, your image will become an evaluation image. When you unload the evaluation feature, your image will still be an evaluation image. For this reason, be sure to unlock all features you have purchased before you load them into your image.

## After installing VisualAge Smalltalk Version 5.5.2

The Version 5.5.2 installation automatically merges the Version 5.5.2 code into the Version 5.5 or 5.5.1 manager.

If you had previously installed Version 5.5 or 5.5.1, before you use VisualAge Smalltalk Version 5.5.2, do the following:

1. Version and release all open editions of classes and subapplications, and version the applications.
2. Save to files any text from workspaces or from the Transcript window that you want to keep.
3. After you have completed the install, you can then load your versioned work from the new Version 5.5.2 manager into the VisualAge Smalltalk Version 5.5.2 client.

## Uninstalling VisualAge on Windows

**Note:** Uninstalling VisualAge Smalltalk Version 5.5 or 5.5.1 removes VisualAge Smalltalk Version 5.5 or 5.5.1 and all refreshes of VisualAge Smalltalk Version 5.5 (e.g. Version 5.5.1 and 5.5.2). You should uninstall the client first, then the manager.

To uninstall VisualAge on Windows,

1. From the **Start Menu**, select **Control Panel → Add/Remove Programs**. Select the VisualAge Smalltalk product you installed, then select **Remove**.
2. Click **Next** to continue.
3. After the uninstall program is finished, click **Finish** to exit the uninstall program.
4. Reboot your computer.

## Uninstalling VisualAge on OS/2

**Note:** Uninstalling VisualAge Smalltalk Version 5.5 or 5.5.1 removes VisualAge Smalltalk Version 5.5 or 5.5.1 and all refreshes of VisualAge Smalltalk Version 5.5 (e.g. Version 5.5.1 and 5.5.2). You should uninstall the client first, then the manager.

To uninstall VisualAge on OS/2, do the following:

1. Double-click on the **Uninstall VisualAge Smalltalk Enterprise** client or manager icon in the VisualAge folder.

2. Click **Next** to continue.
3. After the uninstall program is finished, click **Finish** to exit the uninstall program.
4. Reboot your computer.

---

## Installing VisualAge Smalltalk Enterprise Version 5.5.2 on UNIX

**Note:** It is no longer necessary to uninstall previous versions of VisualAge Smalltalk prior to installing version 5.5/5.5.1/5.5.2.

**Note:** Uninstalling VisualAge Smalltalk Version 5.5 or 5.5.1 removes VisualAge Smalltalk Version 5.5 and all subsequent refreshes of VisualAge Smalltalk (e.g. Version 5.5.1 and 5.5.2).

**Note:** On the Sun platform, create the /opt/IBMvast/5.5 directory before starting to install.

This section guides you through installing VisualAge on UNIX.

1. Change your current working directory to the client or manager subdirectory of the temporary directory:
  - cd\_m
  - cd\_c
2. Change your current working directory to a platform-appropriate subdirectory of the temporary directory:
  - install\_a
  - install\_h
  - install\_s
3. Run **setup**.
  - From the shell command line, run `xterm -sb -e ./setup&`
4. To install the manager, see “Installing the library manager”. To install the client, see “Installing a client” on page 10.

### Installing the library manager

The library manager holds your VisualAge Smalltalk source code. The VisualAge Smalltalk Enterprise - Library Manager should be installed before installing VisualAge Smalltalk Client. The Manager should be installed first, on a server accessible by those application programmers who will be using VisualAge. The Manager can be installed just once, by a system administrator. The client should be installed by the system administrator on each workstation.

**Note:** The installer writes installation status messages to its ‘stdout’ stream. These messages will appear within the `dterm` or `xterm` where the installer was started. When the installation is finished, this window will show a **Finished** message.

To install the VisualAge Smalltalk Enterprise - Library Manager, do the following:

1. On the Welcome window, select **Readme** to view the readme file for any late-breaking information on the UNIX version of VisualAge.
2. On the License Agreement window, read the license agreement. If you agree to the terms and conditions, select **Accept**. Otherwise select **Decline** and exit the installation.

3. If you have previously installed VisualAge Smalltalk Manager Library 5.5 or 5.5.1, the Verify Development Manager Library page appears. Verify or type the directory of the manager library and click **Next**. A second Verify Development Manager Library page then appears. Ensure that you have backed up your VisualAge Smalltalk Manager Library 5.5 or 5.5.1 and check the **I have backed up my manager library** box.
  4. On HP-UX and Sun Solaris, on the Select Features window, if you have previously installed VisualAge Smalltalk Enterprise Version 5.5 or 5.5.1 Manager, next to the Version 5.5/5.5.1 features that were previously installed you will see a + and a number that indicates the approximate size difference of the feature in VisualAge Smalltalk Version 5.5.2. On AIX, the + and the number indicate the full size of the feature in VisualAge Smalltalk Version 5.5.2.
- Note:** On some Unix platforms, problems have been reported on the Select Features screen. After selecting a new feature to install, sometimes the **Next** button is not enabled due to an error in synchronization of the features. To correct this problem, select the **Back** button and then on the License Agreement screen, select the **Accept** button. The **Next** button on the Select Features screen should then be enabled.
5. On the Select Features window check off the features you wish to install by clicking the box next to the feature(s). Click **Next** to continue.
  6. You will now be asked to complete the installation. Verify that all of the information is correct and click **Next**. The product will now install.
  7. When the installation is complete, click **Finish** to end the install program or **View Readme** to view the readme file.

The files are installed to /opt/IBMvast/5.5 directory.

The size of the library manager will grow considerably as optional features are loaded and as source code accumulates during the course of a development effort. It is possible to install the library manager on a filesystem other than /opt, and to run the EMSRV daemon with the library manager on the alternate filesystem. This may be a convenient configuration for managing the growth of the library manager and for maintenance backups.

To install the library manager on an alternate filesystem you must complete a couple of steps manually. Before performing the install, create a /opt/IBMvast/5.5/manager filesystem which is mounted on a logical volume other than the volume on which /opt is mounted, or define /opt/IBMvast/5.5/manager as a symbolic link to a directory on such an alternate filesystem.

**Note:** The filesystem on which the library manager resides must be mounted on a local drive. The EMSRV daemon will not operate properly if the library manager file is on a remote NFS filesystem.

If you are using EMSRV, you must set up and start EMSRV after you install the library manager.

- Setting up EMSRV for UNIX operating systems
- Starting EMSRV for UNIX operating systems

## Installing a client

**Note:** 75mb of free space, in the /tmp filesystem, are required in order to install VisualAge Smalltalk Enterprise Client Version 5.5, 5.5.1, or 5.5.2.



**Note:** The installer writes installation status messages to its 'stdout' stream. These messages will appear within the dtterm or xterm where the installer was started. When the installation is finished, this window will show a **Finished** message.

Before installing a VisualAge Smalltalk Client, you need to know some information about where the library manager is installed.

You can use EMSRV to connect to the manager. The EMSRV environment is set up during the client install.

The library manager administrator should provide the following information about the VisualAge library:

- The TCP hostname or the IP address (dotted decimal address) of the server where the library manager is installed
- The path on the server where the library manager is installed

To install a VisualAge Smalltalk client, do the following:

1. On the Welcome window, select **Readme** to view the readme file for any late-breaking information on the UNIX version of VisualAge.
2. Read the License Agreement. If you agree to the terms and conditions, select **Accept**. Otherwise, **Decline** and exit the installation.
3. For HP-UX and Sun Solaris, on the Select Features window, if you have previously installed VisualAge Smalltalk Enterprise Version 5.5 or 5.5.1 Client, next to the Version 5.5/5.5.1 features that were previously installed you will see a + and a number that indicates the approximate size difference of the feature in VisualAge Smalltalk Version 5.5.2. On AIX, the + and the number indicate the full size of the feature in VisualAge Smalltalk Version 5.5.2.
4. On the Select Features window check off the features you wish to install by clicking the box next to the feature(s). You should not install features that you didn't also select when installing the Library Manager. Click **Next** to continue.

**Note:** On some Unix platforms, problems have been reported on the Select Features screen. After selecting a new feature to install, sometimes the **Next** button is not enabled due to an error in synchronization of the features. To correct this problem, select the **Back** button and then on the License Agreement screen, select the **Accept** button. The **Next** button on the Select Features screen should then be enabled.

**Note:** The VisualAge Smalltalk Enterprise Client represents the base code necessary to run the client.

5. You will now be asked to complete the installation. Verify that all of the information is correct and click **Next**. The product will now install.
6. When the installation is complete, click **Finish** to end the install program or **View Readme** to view the readme file.

The files are installed to /opt/IBMvast/5.5 directory.

## Unlocking development products on UNIX

**Note:** Any features that were unlocked in the VisualAge Smalltalk Enterprise Version 5.5 or 5.5.1 image must be unlocked in the VisualAge Smalltalk Enterprise Version 5.5.2 image. Ensure that the unlock tool is pointing to the new VisualAge Smalltalk Enterprise Version 5.5.2 ini file in the image552

directory.

If you have purchased VisualAge Smalltalk Enterprise - Client or any of its associated features, a system administrator must unlock the product after install. If the product is not unlocked, you will be using a evaluation version of the product, which will not let you save your image after 30 days.

To unlock VisualAge, or any of the purchased features, in your CDE FileManager, change to the /opt/IBMvast/5.5/unlock directory. Double-click on **abtunlock**, then do the following:

1. Select the ini file that supports the products you want to unlock.

**Note:** Normally this is abt.ini in the same directory as your image. If you have copied your image and INI file to other directories, you should select **Browse** to identify the file to be unlocked.

2. Select **Next**.

The Unlock utility now lists all of the VisualAge products you can unlock.

3. Select the product(s) you want to unlock.

4. In the License Agreement window, select your country, then read the license. If you agree with the terms and conditions, select **Accept**.

**Note:** If you do not agree with the terms and conditions listed in the License Agreement, select **Decline** and exit the Unlock Program.

5. In the Unlock Product window, enter your License number and the Key that you received when you purchased the product.

6. Select **Unlock**.

The Unlock utility confirms that the product is unlocked or provides hints on why the product isn't unlocked.

You must unlock each product you have purchased. If you load an evaluation feature into your image, even if you have unlocked VisualAge, your image will become an evaluation image. When you unload the evaluation feature, your image will still be an evaluation image. For this reason, be sure to unlock all features you have purchased before you load them into your image.

## After installing VisualAge Smalltalk Version 5.5.2

The Version 5.5.2 installation automatically merges the Version 5.5.2 code into the Version 5.5 or 5.5.1 manager.

If you had previously installed Version 5.5 or 5.5.1, before you use VisualAge Smalltalk Version 5.5.2, do the following:

1. Version and release all open editions of classes and subapplications, and version the applications.
2. Save to files any text from workspaces or from the Transcript window that you want to keep.
3. After you complete the install, you can then load your versioned work from the new Version 5.5.2 manager into the VisualAge Smalltalk Version 5.5.2 client.

## Configuration and startup

Before you can start VisualAge you must configure your installation.



## VisualAge Smalltalk Enterprise - Client

The Smalltalk image start-up configuration file includes statements which may need to be tailored to your network configuration. The file, `abt.ini`, is located in the `/opt/IBMvast/5.5/newimage` directory.

The following IP host specifications must be verified or modified in your `/opt/IBMvast/5.5/newimage/abt.ini` file according to your configuration.

`ServerAddress=`

They are expected to contain the host name or dotted-decimal IP address of the host where the server component of the product was installed.

**Note:** By default, this is the system's loopback address — `localhost`. This will only work if you are using a client that is installed on the same computer as the manager.

## VisualAge Smalltalk Enterprise - Manager

The VisualAge manager component uses a daemon to manage concurrent access to library and import files. This program is named `EMSRV`.

To start the `EMSRV` process, do the following:

1. `su -`

2. `/opt/IBMvast/5.5/bin/emdevnum /opt/IBMvast/5.5/manager/mgr55.dat`

This shows you the device number of the `mgr55.dat` file. The message might read The device number of `/opt/IBMvast/5.5/manager/mgr55.dat` is 64.

3. `/opt/IBMvast/5.5/bin/emsrv -xd<device_number>`

For example, using the device number returned in the previous step, type `/opt/IBMvast/5.5/bin/emsrv -xd64`

For more options on starting `EMSRV`, type `emsrv -h` at a command prompt.

**Note:** Before you shut down your system or uninstall VisualAge Smalltalk, you should stop the `EMSRV` process by issuing the command:  
`/opt/IBMvast/5.5/bin/emadmin stop.`

## VisualAge Smalltalk developer setup

Each VisualAge Smalltalk developer requires certain files in their own working directory. A copy of the appropriate files may be obtained by running the program `/opt/IBMvast/5.5/bin/vasetup`.

When you run `vasetup` VisualAge Smalltalk copies the master `abt.ini` file to your working directory. If the system administrator makes any additional changes to the master `abt.ini` file, for example unlocking the Client Base or any features, the copy of `abt.ini` that is in your working directory will not match the master `abt.ini` in `/opt/IBMvast/5.5/newimage`. If the administrator unlocks components in the master `abt.ini` file, but those components are not unlocked in your `abt.ini` you can do one of two things:

- If you have not made any changes to your copy of `abt.ini`, you can copy the updated master `abt.ini` from `/opt/IBMvast/5.5/newimage` to your working directory. This will overwrite the `abt.ini` that is in your working directory with a new copy of the master `abt.ini` containing the keys for the unlocked products.
- If you have made changes to your copy of `abt.ini`, you can run the unlock utility against your copy of `abt.ini`. In the unlock utility, make sure that you specify the location for your personal copy of `abt.ini`.

## Uninstalling VisualAge Smalltalk on UNIX

**Note:** Uninstalling VisualAge Smalltalk Version 5.5 or 5.5.1 removes VisualAge Smalltalk Version 5.5 or 5.5.1 and all refreshes of VisualAge Smalltalk Version 5.5 (e.g. Version 5.5.1 and 5.5.2). You should uninstall the client first, then the manager.

As of Version 5.5, you no longer are required to uninstall any previous releases of VisualAge Smalltalk, prior to installing VisualAge Smalltalk on UNIX. If you decide that you are going to uninstall a previous version, please follow the directions noted:

**Note:** Back up the previous version's manager and any other library files you intend to import into the Version 5.5/5.5.1 manager before you uninstall.

Before you uninstall a previous version of VisualAge Smalltalk on UNIX, do the following:

1. Export any applications or configuration maps from your existing library that you intend to use with the upgraded product.
2. Archive your library files, exports, and any other files that you may have added or customized for your site.

### Uninstalling VisualAge Smalltalk on AIX

To uninstall a previous version of VisualAge Smalltalk on AIX, do the following:

1. Login as root user.
2. Start the System Management Interface Tool (SMIT). Enter `smit install_remove&` on the command line of the aixterm where you are logged in as root.
3. Select the **List** button for the **SOFTWARE name** option and select the products you want to remove.
4. Change the **PREVIEW only?** option to NO.
5. Leave the default for the rest of the options.
6. Select **OK**.

A window appears, showing the actual AIX command being executed and a log of execution status. The command text is also written to the file `smit.script`, and the log text is written to the file `smit.log`.

7. Select **Exit Smit** from the **Exit** pull-down menu.

### Uninstalling VisualAge Smalltalk on HP-UX and Solaris

#### Uninstalling VisualAge Smalltalk Client

To uninstall VisualAge Smalltalk Client on HP-UX or Solaris, execute the following commands:

```
cd /opt/IBMvast/5.5/inst
./uninst_client
```

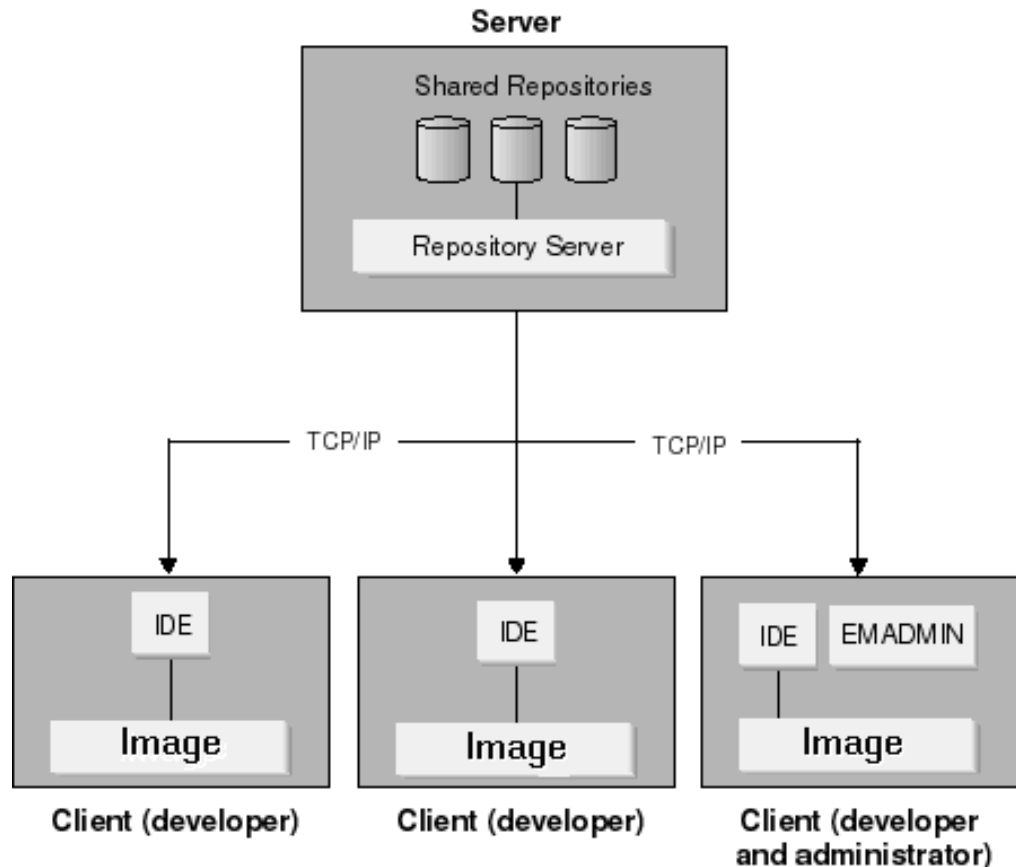
#### Uninstalling VisualAge Smalltalk Manager

To uninstall VisualAge Smalltalk Manager on HP-UX or Solaris, execute the following commands:

```
cd /opt/IBMvast/5.5/inst
./uninst_manager
```

## Chapter 2. Setting up team programming with EMSRV

The following drawing shows the client and server components that make up a VisualAge Smalltalk Enterprise team development environment.



Connectivity is provided by a TCP/IP network.

Any computer where a shared repository will reside must be a server, which is to say it must run the repository server program (EMSRV). There may be more than one server in your environment. Each server has the following components:

- One or more source code repositories (.dat files), shared by the team
- The repository server (emsrv.exe, emsrv.nlm, or emsrv). This program manages concurrent client access to the shared repositories on the server.

VisualAge Smalltalk Enterprise clients have the following components:

- The Integrated Development Environment (abt.exe)
- An image (abt.icx)
- Optionally, a local repository (.dat file) for offline development
- The EMADMIN utility (emadmin.exe or emadmin), which is most commonly used by the person responsible for operating the repository server, for example to check the server's status

EMSRV is the program that manages concurrent access to shared repositories on the server. It uses native locking calls to manage file input/output requests against the library files on the server. The administrator must start the library server, using the emsrv command, before clients can connect to the shared library. The administrator then uses the EMADMIN utility to manage the library server.

**Note:** VisualAge Smalltalk supports EMSRV 6.23 or later. These releases require that library files reside on a local file system.

---

## Server Considerations in Team Development

To enable team programming with VisualAge Smalltalk, the library server (EMSRV) must be installed on any computer where one or more shared repositories will reside. You may have one or more library servers in your team development environment. Below are some issues to consider when planning where to install shared repositories and the library server.

The EMSRV client process runs automatically on VisualAge Smalltalk Enterprise clients.

### Server capacity and availability

Run EMSRV on server-class computers. For optimal availability and performance, servers should be dedicated; that is, shared repositories should not reside on a developer's workstation.

### Library size

EMSRV supports repositories of up to 16 GB. The actual size limit may be smaller depending on the capabilities of the file system or operating system where EMSRV is running. Refer to the VisualAge Smalltalk web page for more information.

**Note:** On UNIX operating systems, there are system and user configuration parameters that might limit the ultimate size of a manager library. Please contact your system administrator for details on how to get large file support.

### Versions of EMSRV

VisualAge Smalltalk Version 5.5.1 supports EMSRV Version 6.23 or higher. If you have a server that is running EMSRV code prior to EMSRV Version 7.0, the EMADMIN 7.0 utility will not work. For example, if your server is running EMSRV Version 6.24, you cannot use EMADMIN Version 7.0 with that server. We recommend that you upgrade to the latest versions of EMSRV and EMADMIN.

### Threads and performance

EMSRV for Windows NT/2000 and NetWare use one thread per client connection. This means that EMSRV readily scales to support more connections on these platforms. EMSRV automatically spawns threads to handle client connections.

EMSRV for OS/2 or UNIX only use one process per client connection. This means that EMSRV performance degrades slightly as the number of connections increases.

### TCP/IP connections

EMSRV uses TCP/IP for its client/server network connections. The default limit for client connections to a server is 256. The default limit for client connections can

be changed by using the -M command line option when starting EMSRV. Theoretically, the number is bounded primarily by memory, but testing has shown that some TCP/IP stacks will run out of stream sockets before this limit of memory is reached. Typically, this number is greater than one hundred but it varies with each stack.

The default port number for the EMSRV server and client connections is 4800. This can be changed by using a command line parameter when starting EMSRV, when running EMADMIN, and when connecting from the development client to EMSRV.

## Server files

The team development server requires the following files:

- The executable program for the library server
- The library server log file
- One or more shared repositories

The server repositories must reside on the same computer as EMSRV. EMSRV does not support accessing a library on a remote file system.

## Installation

EMSRV code is installed when you install the VisualAge Smalltalk Enterprise manager library or client. For information about starting EMSRV, see the appropriate section for your operating system:

- EMSRV for Windows NT/2000
- EMSRV for OS/2
- EMSRV for NetWare
- EMSRV for UNIX operating systems

## File access rights

All files created by the library server are owned by the EMSRV user. The library server has the file access rights of the EMSRV user. To ensure the integrity of shared repositories, you may wish to restrict rights for library files to the EMSRV user.

## Planning for library growth

In the team development environment it is quite common for the shared library to grow very large, over several hundred megabytes. You should ensure that the library is stored on a computer that can handle this type of load.

## Password validation

**Note:** Although VisualAge Smalltalk supports password checking through EMSRV, it should not be considered a highly secure system. The password checking is provided mainly as a convenience to maintain an audit trail of changes to library content.

VisualAge Smalltalk supports three levels of user validation. These levels consist of the following:

- No validation. This is the default. It allows users to switch to other users within the VisualAge Smalltalk environment at will.

- Specify VisualAge Smalltalk user IDs and passwords for all users of VisualAge Smalltalk. This option requires the maintenance of a passwd.dat file, plus the use of the -rp (or -r option for UNIX) option when starting EMSRV.
  - Use the native operating system user names and passwords for all users of VisualAge Smalltalk. This option requires the use of the -rn option (-v option for UNIX) when loading EMSRV and no maintenance of a passwd.dat file.
- Native passwords can be used on all platforms except OS/2.

### Using a passwd.dat file

If you intend to maintain VisualAge Smalltalk user IDs on your site, you must create and maintain a passwd.dat file in the working directory.

This file contains the logon user IDs of all users and their respective passwords for VisualAge Smalltalk. The VisualAge Smalltalk passwords should not be the users' actual logon passwords. The format of the file is one user ID and password per line, with the user ID first, followed by a single space and the password.

**Note:** The passwd.dat file should have its access rights restricted so it cannot be read or written by regular VisualAge Smalltalk users.

The following shows an example of a passwd.dat file:

```
fred mypassword
barney secret
wilma hello
betty ZXF6
```

### Connecting client to server when EMSRV uses native passwords

When setting up a repository, you will be prompted for a supervisor password. As the system is installed off the CD, there is a single user defined, the Library Supervisor. You must specify the Library Supervisor's password when connecting the client to the server for the first time.

If you are using passwd.dat checking, you can look in that file to locate the Library Supervisor's password. If there is not a password specified, you may at this point add one.

If you are using network password authentication, your domain controller will need to have 'supervis' (the network name of Library Supervisor) defined as a valid user.

If you want to use native password authentication but do not want to define a network userid of 'supervis', then you should perform the following steps:

1. Start EMSRV with password authentication disabled (-rd).
2. Start a client image. Select **Tools** → **Users** → **Modify** to change the Network Name of the Library Supervisor to a userid that is already defined on your network.
3. Exit from the client image.
4. Stop EMSRV.
5. Start EMSRV with native password authentication (-rn or -v).

## Authentication on UNIX Platforms

Most native authentication services on UNIX platforms offer multiple options for configuration. The simplest form of native authentication on UNIX platforms is the local password file (usually /etc/passwd) which contains passwords encrypted with a one-way encryption function. Although the passwords cannot be decrypted,

the file is readable by all users of the system and therefore susceptible to dictionary-based password cracking attempts.

The simplest alternative to the local password file is password shadowing. On systems that use NIS/yp or password shadowing, replace each encrypted password in the `/etc/passwd` file with a special token and store the passwords in a separate file not readable by normal system users.

Previous releases of EMSRV for UNIX platforms supported local password files and shadow passwords by using two separate EMSRV executables: `emsrv` and `emsrv.shadow`. This was necessary because each authentication system uses a different programming interface.

Recent releases of most UNIX platforms now offer a single authentication programming interface that can support both of the aforementioned authentication systems as well as many others. The most well-known of these authentication frameworks is PAM (password Authentication Modules). PAM was developed by Sun Microsystems and is now supported by and ships as part of Solaris, Linux, and HP-UX. Although there is no PAM implementation included with AIX, IBM offers a similar `authenticate()` function that can be used to authenticate users using local password files, shadow passwords, and DCE authentication.

A single authentication programming interface makes it possible for one EMSRV executable to use a variety of authentication systems. For this reason, there is no longer an `emsrv.shadow` available on some UNIX platforms. In such cases, the `emsrv` executable can be used to authenticate using shadow passwords and, potentially, other forms of authentication as well.

Where EMSRV uses an authentication framework such as PAM, the authentication system used by EMSRV and its exact configuration, are determined by the environment. For example, EMSRV for Linux uses PAM and, therefore, requires the file `/etc/pam.d/emsrv` to be present and to specify the PAM (module) used by EMSRV.

## **PAM**

On Linux and Solaris platforms, authentication is implemented using PAM (password Authentication Modules). Although this would theoretically allow the use of any PAM (modules) with EMSRV by changing the relevant PAM configuration file, in practice this is not possible.

EMSRV does not converse with clients in a manner that is entirely compatible with the PAM architecture. As a result, EMSRV authentication will only work where the module prompts initially for a text password (supplied initially by the client). The tested and certified authentication methods meet these requirements as will most PAM (modules). Sophisticated modules that require extended conversation or authentication data that EMSRV does not support, will not work correctly with EMSRV. Fingerprint scanners and retina scanners are such examples.

## **Authentication on AIX platform**

EMSRV for AIX now supports authentication using the system `authenticate()` function. This allows one EMSRV executable to support both shadowed and non-shadowed passwords in addition to DCE authentication.

The authentication method for each user is set in the `/etc/security/user` file.



## Authentication on HP-UX platforms

EMSRV for HP-UX continues to implement authentication using two separate EMSRV executables. Although HP-UX 11.0 supports PAM, there is a bug in the implementation that is identical to the bug in the Solaris 2.6 implementation of PAM, as described above. To date, Hewlett-Packard does not have a patch to correct this problem.

## Authentication on Linux platforms

EMSRV for Linux now supports authentication using PAM. This allows both shadowed and non-shadowed passwords to be supported with one EMSRV executable.

In addition, Red Hat Linux 6.2 supports MD5 passwords and EMSRV also supports these via PAM

PAM must be correctly configured on a machine running EMSRV otherwise it will not even be possible to shutdown EMSRV using EMADMIN. The PAM configuration file must be copied to /etc/pam.d/emsrv. A sample PAM configuration file is included with this release (see /opt/IBMVast/5.5/samples/PAM).

## Authentication on Solaris platforms

EMSRV for Solaris now supports authentication using PAM. This allows both shadowed and non-shadowed passwords to be supported with one EMSRV executable.

There is a bug in the Solaris 2.6 implementation of PAM that prevents EMSRV from working correctly. The patch 106257-05 must be applied when using EMSRV with Solaris 2.6. The patch is available at: [http://sunsolve.sun.com/pub-cgi/retrieve.pl?doc=fpatches%F106257&zone\\_32=PAM](http://sunsolve.sun.com/pub-cgi/retrieve.pl?doc=fpatches%F106257&zone_32=PAM)

The specific bug that this patch fixes is:

4092227 pam\_conv appdata\_ptr member is not passed thru to conv() function as documented

The patch is not required for Solaris 7.0.

PAM must be correctly configured on a machine running EMSRV otherwise it will not even be possible to shutdown EMSRV using EMADMIN. The /etc/pam.conf file is included with this release (see /opt/IBMVast/5.5/samples/PAM).

## Usage of Root Access for Authentication

Root access on UNIX platforms is required to authenticate users. EMSRV does NOT need to be started by the root user to accomplish this. Doing so would compromise security as EMSRV would then have complete access to all filesystems.

Instead, you should change the owner of the EMSRV executable to 'root' and set the SUID bit of the executable. This can be accomplished as follows:

```
chown root EMSRV
chmod u+s EMSRV
```

when EMSRV attempts to authenticate a user, it will temporarily change the authority of the running EMSRV process to be the authority of the owner of the executable. Once authentication is complete, the authority of the running EMSRV process will be changed back to that of the user that started EMSRV. This happens on a per-process (per-client) basis so while a client is being authenticated, only the process serving that client has temporary root access.



Root access for authentication is required regardless of how EMSRV actually implements authentication. Interfaces such as PAM only provide a common API to permit applications to support multiple authentication methods, configuration specific to each method of authentication must still be correct.

## Authentication on Windows platforms

Account names authenticated by EMSRV for Windows NT/2000 can come from two sources — the name of the EMSRV user and the network names for users managed in a repository. As of this release, an account name may be in one of three formats:

```
Simple name
adrian
Windows NT 4.0 SAM-compatible name
engineering\adrian
user principal name
adrian@ral.ibm.com
```

Windows NT 4.0 and Windows 2000 non-domain controllers support simple names and SAM-compatible names. Windows 2000 domain controller support all three formats. Previous releases of EMSRV controllers support all three formats. Previous releases of EMSRV for Windows NT only supported simple names. The new formats allow authentication between domains as well as in an Active Directory.

Windows NT and Windows 2000 supports installable authentication and security packages, allowing the system to be extended with new forms of authentication and security. EMSRV for Windows NT/2000 only supports the default packages supplied with Windows NT and Windows 2000—namely the MSV1\_0 and Kerberos authentication packages and the NTLM (NT LAN Manager) and Kerberos security packages.

### Authentication Procedure using Windows NT and Windows 2000 Non-Domain Controllers

EMSRV for Windows NT/2000 uses NTLM (NT Lan Manager) authentication on Windows NT 4.0 and Windows 2000 non-domain controllers. User records in these systems are stored in a SAM (Security Accounts Manager) database.

To authenticate a user, EMSRV must first find the name of the domain with the SAM database that contains the user to be authenticated. The term domain applies equally to non-domain controllers because every SAM database contains a built-in domain known as 'BUILTIN' as well as for non-domain controllers, a domain with the same name as the machine or for domain controllers, the controlled domain.

If a SAM-compatible name (specifying a domain) is supplied, then the domain is already known. If a simple name is provided then the following are checked to find the user:

- a list of well-known SID (Security Identifiers)
- built-in and administratively defined local accounts
- the primary domain
- trusted domains

Once the domain is known, an attempt is made to authenticate the user in that domain.

If the domain name matches the name of the SAM database on the local machine then the authentication is processed on that machine. The name of the SAM database on a Windows NT Workstation that is a member of a domain, is

considered to be the name of that Windows NT machine. The name of the SAM database on a Windows NT Advanced Server is the name of the domain. If a Windows NT machine is not a member of a domain then authentication is processed locally.

If the domain specified is trusted by the domain of the machine running EMSRV, the authentication request is passed through to the trusted domain. On a Windows NT workstation, the request is always passed through to the primary domain controller of the workstation, allowing the primary domain controller to determine if the specified domain is trusted.

If the domain name specified is not trusted by the domain of the machine running EMSRV, the authentication request is processed on that machine as if the domain name specified were that domain (or computer) name. In other words, the domain name is ignored. The system does not differentiate between a nonexistent domain or an untrusted domain.

An example illustrates how cross-domain authentication can be setup:

There are two domains: KIRA and CHIEF. The domain controller for the KIRA domain is NT4PDC. The domain controller for the CHIEF domain is NT4PDC2. A trust relationship is setup so that CHIEF is a trusted domain of KIRA (and hence KIRA is a trusting domain of CHIEF). The trust relationship is one-way such that KIRA is not a trusted domain of CHIEF.

EMSRV is setup to run on KIRA\NT4PDC. Users in both domains can be authenticated. Account names may be specified using a simple name in which case EMSRV will locate the domain containing the user, or the domain may be specified using a SAM-compatible name such as CHIEF\ADRIAN.

EMSRV is setup to run on CHIEF\NT4PDC2. Only users in the CHIEF domain can be authenticated because KIRA is not a trusted domain of the CHIEF domain.

### **Authentication Procedure Using Windows 2000 Domain Controllers**

EMSRV for Windows NT/2000 uses Kerberos authentication on Windows 2000. User records for Windows 2000 domain controllers are stored in an Active Directory instead of a SAM database. The KD (Key Distribution Center) service must be running to use Kerberos authentication.

If a simple name is supplied, then the procedure for locating the user is the same as that for Windows NT 4.0 and Windows 2000 non-domain controllers. The one difference is that in addition to checking the following:

- a list of well-known SID (Security Identifiers)
- built-in and administratively defined local accounts
- the primary domain
- (explicitly) trusted domains

every domain in the forest for the machine running EMSRV, is also checked. This makes sense since a forest is a collection of Active Directory trees connected by two-way transitive trust relationships.

A SAM-compatible name will be authenticated with the domain that the name specifies. A User Principal Name will be authenticated with Active Directory Services.

The implementation of Kerberos authentication in Windows 2000 is already well-documented elsewhere and does not need to be repeated here. In summary:

The NTLM protocol requires that the server must contact a domain controller. When Kerberos is used, the server does not have to contact the domain controller. A client gets a ticket for a server by requesting one from a domain controller in the server account domain; the server validates the ticket without consulting any other machine.

An example illustrates how Active Directory authentication can be setup:

There are three Active Directory domains - ibm, ral.ibm, and engineering.ral.ibm. The engineering.ral.ibm domain is a child of the ral.ibm domain and the ral.ibm domain is a child of the ibm domain. Each parent-child relationship automatically creates a two-way transitive trust relationship. As a result, since ral.ibm trusts engineering.ral.ibm and ibm trusts ral.ibm, ibm trusts engineering.ral.ibm. The three domains form a tree.

In addition there is another Active Directory domain - bedrock, which forms a tree of one domain. The ibm tree and the bedrock tree together form a forest - they share a common schema, configuration, global catalog, and are linked with two-way transitive trusts at the tree roots.

Finally there is an NT 4.0 domain - KIRA. A one-way trust relationship is setup so that ibm trusts KIRA.

If EMSRV is run on the domain controller for the ibm domain, users from the following domains can be authenticated:

- ibm
- ral.ibm
- engineering.ral.ibm
- bedrock
- KIRA

Simple names for users in any of those domains will cause a search to be initiated to find the domain containing the user. Alternatively, names may be specified in any one of the other two formats previously described.

### **Advanced User Rights Required for Authentication**

A number of advanced user rights are required for authentication to work correctly. Authentication is required even if EMSRV is not started with the -rn option since EMSRV authenticates the EMSRV account when it is started and stopped.

As detailed in the EMSRV documentation, Advanced user rights are set in the User Manager for Windows NT 4.0 and the Local Security Policy for Windows 2000 Professional. For Windows 2000 Server, it may be necessary to also set the rights in the Domain Controller Security Policy and the Domain Security Policy so that the Effective Policy Setting for each right is correct in the Local Security Policy. Windows 2000 Advanced Server does not have a Local Security Policy. Instead, the right should be set in the Domain Controller Security Policy and the Domain Security Policy as necessary.

Each of the advanced user rights required for correct EMSRV operation are detailed below

### **Act as part of the operating system**

This right is required for authentication and must be set for the account from which EMSRV is started (if EMSRV is not started as a service) and the EMSRV account. Note that both accounts must also be part of the 'Administrators' group.

### **Logon as a service**

This right is required if EMSRV is being started as a service and must be set for the account from which EMSRV is started (if EMSRV is not started as a service) and the EMSRV account. You must also ensure that the 'Deny logon as a service' right is not set for each of the accounts.

### **Logon locally**

This right is required if EMSRV is being started interactively or from a batch job and must be set for the account from which EMSRV is started (if EMSRV is not started as a service) and the EMSRV account. You must also ensure that the 'Deny logon locally' right is not set for each of the accounts.

### **Access this computer from the network**

This right is required for each account which will be used to authenticate a client. You must also ensure that the 'Deny access to this computer from the network' right is not set for each account.

## **Authentication on NetWare platforms**

In previous releases of EMSRV, two versions of the EMSRV for NetWare NLM were supplied - one that used bindery authentication and one that used NDS authentication. Bindery authentication is no longer supported. This release includes one NLM that supports NetWare 4.2 and 5.1. EMSRV no longer supports versions 3.x of NetWare.

Account names authenticated by EMSRV for NetWare can come from two sources - the name of the EMSRV user and the network names for users managed in a repository. Account names can be simple or distinguished. Both forms can also be typeful or typeless. Some examples are provided below:

```
Simple typeless name
adrian
Simple typeful name
CN=adrian
Distinguished typeless name
adrian.engineering.ral.IBM
Distinguished typeful name
CN=adrian.OU=engineering.OU=ral.O=IBM
```

Names are always authenticated in the context of the NDS context that is specified when EMSRV is started (the context is appended to the account name). Absolute names (those preceded with a period) are authenticated in the [Root] context (any context specified when EMSRV was started, is ignored). For each trailing period in a name, one component of the context is removed before being appended to the name. This allows names to be resolved in containers that are higher in an NDS tree than the specified context. Some examples:

```
Context      engineering.ral.IBM
Name        adrian
Resulting name  adrian.engineering.ral.IBM

Context      engineering.ral.IBM
Name        .admin.IBM
```

Resulting name	.admin.IBM
Context	engineering.ral.IBM
Name	kathy.support.phx..
Name	kathy.support.phx.IBM

By using a distinguished name, it is possible to authenticate users in different containers. The most common case for this may be if the account names for users are located in one container but the EMSRV user is located in another. For example, if Netware accounts corresponding to network names of users in a repository exist in the container 'engineering.ral.IBM' but the EMSRV user exists in the container 'IBM', the following command could be used to load EMSRV:

```
load emsrv -u .EMSRV.IBM -p test - W sys:emsrv -rn -SC engineering.ral.IBM
```

Alternatively, the following command would also accomplish the same result:

```
load emsrv -u EMSRV.IBM.. -p test - W sys:emsrv -rn -SC engineering.ral.IBM
```

## Library path names

Install your VisualAge Smalltalk Manager Library on a file systems local to the computer that is running EMSRV.

On Windows and OS/2, **do not** use a mapped network drive.

On UNIX, **do not** use a remote NFS file system.

## File access rights

EMSRV has the file access rights of the EMSRV account for PC platforms or the account that starts EMSRV under UNIX. This means that the EMSRV account must have access rights to all directories and files that VisualAge users require. To ensure the integrity of the library file manager.dat, the access rights for this file may be restricted to the EMSRV account.

## File creation and ownership

All files created by EMSRV are owned by the EMSRV account.



---

## Chapter 3. The EMADMIN utility

The EMADMIN command-line utility helps you manage and communicate with a repository server (EMSRV) from any network attached workstation where emadmin.exe is installed.

The EMADMIN utility consists of the following commands:

Command	Description
copy	Copies a VisualAge library on the server.
help	Displays the valid commands and options.
list	Displays the current EMSRV connection list or information about a specific connection.
opts	Displays the current EMSRV options.
stat	Displays EMSRV statistics.
stop	Shuts down EMSRV remotely or kills an active connection.

**Note:** EMSRV client/server connections on a WAN are not supported or recommended. Although some users have successfully connected over the wide-area networks, which are rated at speeds less than 10 megabits/second, such networks are not supported.

---

### Using EMADMIN

EMADMIN uses the following syntax:

EMADMIN [command] [command modifier] [option]

#### Syntax

[command]

[command modifier]

[option]

[<host>]

#### Description

The EMADMIN command you are issuing.

The specific modifiers for that command.

These are described in the documentation of each command.

EMADMIN has one option, the port number, -P<port number>. This parameter specifies the port that EMSRV is using instead of the default. The default port number is 4800. This option is available for all EMSRV commands.

specifies the hostname or IP address of the server, where EMSRV is running.

Statistics gathered by EMADMIN can either be displayed on the screen or redirected to a file.

For example, to send the list of current connections to EMSRV running on an IP address 137.65.2.11 to the screen, enter:

```
EMADMIN list 137.65.2.11
```

To send the list of current connections to EMSRV running on the local machine to the file clist.txt, enter:

```
EMADMIN list > clist.txt
```

---

## Copying files (copy command)

The copy command allows you to copy one repository, the source, to another repository, the target. The target repository can be on the same EMSRV server as the source, or on a different EMSRV server that is on the same network.

The copy command locks the library to ensure that the library cannot be changed while it is being copied.

To use the copy command, the following conditions must exist:

- The specified source file must be a valid VisualAge library file.
- The EMADMIN user must know the EMSRV account password.
- The password characters are not displayed on the screen.
- The library file can be copied only if the correct password has been entered.
- To run the copy command in a batch file, the password may be specified as part of the command line. This, in conjunction with the -q (quiet) option, ensures that no prompting occurs during the batch process.

The syntax for the copy command is:

```
EMADMIN copy [-o] [-p<password>][-q][ -P<port number> ] <source> <dest>
```

### Parameter

<source>

### Description

A valid VisualAge library file; the source file will be locked.

<dest>

File specification must be accessible to the EMSRV user account. A VisualAge file specification has the following format:

<ip\_address>:<file name>

<ip\_address> is optional and specifies the host that EMSRV is running on. It can be either the file server IP host name or its Internet address. If a host name is not provided, localhost is used.

<file name> is required and is the file specification.

### Modifier

-o

### Description

The copy command default behavior does not overwrite an existing file. Normally, you are prompted for overwrite permission. The -o option specifies that the destination file may be overwritten without prompting.

-p

This specifies the password to use when the copy command is validating access to the source database. The password cannot contain spaces.

-q

By default, the copy command prints the number of bytes transferred during the copy operation. The -q option indicates "quiet operation" and the transfer count is not printed. When this option is enabled, you will not be prompted about potential problems from low disk space.



Modifier	Description
-P <port number>	This is an optional parameter that specifies the port that EMSRV is using . The default numbers is 4800.

For example, to copy a library file to a backup file, enter the following command:

```
emadmin copy -o -p secret -q 15.1.33.20:manager.dat 15.1.33.20:test.dat
```

This example copies (in quiet mode) manager.dat to test.dat in the working directory, overwriting test.dat if it exists and using the password "secret" to access the source library.

## Listing current connections (list command)

The list command lists current connections for to a repository server. This command sends a message to the host running EMSRV and requests the list of connections. Information about connection statistics and active locks can be obtained using the list command modifiers.

**Note:** To verify that all clients are disconnected, use the list operation before stopping EMSRV.

The syntax for the list command is:

```
EMADMIN list [command modifiers] [<host>[-P<port number>]]
```

The list command has the following modifiers:

Modifier	Description
-s[<connection number>]	Displays the statistics for the connection specified by <connection number>.
-l[<connection number>]	Displays the active locks for the connection specified by <connection number>.
<host>	Specifies the host name or IP address of the server where EMSRV is running. If you don't specify a host, the default is the name of the host from which you are issuing the emadmin command.
-P <port number>	This is an optional parameter that specifies the port that EMSRV is using . The default numbers is 4800.

For example:

```
emadmin list emsrv.ibm.com
```

Running this command produces output such as the following:

```
=====
EMSRV 7.0 for Windows NT/2000 Aug 1 2000 22:28:51 (EST)
Operating system: Windows NT Workstation 4.0.1381 Service Pack 4 (1 Processor -
255 MB Memory)
Code page (ANSI): 1252


```

ID	IP Address	Active Locks	Last Request	Socket	File
0	9.25.62.92	0	09:58:23	808	e:\emsrv\vast\va000816_dev.dat
1	9.25.62.110	0	17:09:52	456	e:\emsrv\vast\va000816_dev.dat

```

3 9.25.62.108      0      16:49:02    1668  e:\emsrv\vast\va000816_dev.dat
8 9.25.62.111      0      14:13:10    1196  e:\emsrv\vast\va000816_dev.dat
-----
There are 4 active connections.
=====

```

## Displaying EMSRV options (opts command)

The opts command enables you to display the current options for a repository server and change the logging level for the repository server.

The syntax for the opts command is:

```
emadmin opts <host> [-s<level>]
```

### Parameter

<host>

### Description

Specifies the host name or IP address of the server where EMSRV is running. If you don't specify a host, the default is the name of the host from which you are issuing the emadmin command.

-s<level>

Specifies a new logging level for EMSRV. This command allows you to change the current logging level without having to access the machine where EMSRV is running. You can specify the following logging levels:

- 0** Logs all operations and messages to the log file.
- 1** Logs warnings and errors to the log file.
- 2** Logs only errors to the log file (default).

-P <port number>

This is an optional parameter that specifies the port that EMSRV is using. The default numbers is 4800.

For example:

```
emadmin opts emsrv.ibm.com
```

Running this command produces output such as the following:

```

=====
EMSRV 7.0 for Windows NT/2000  Aug  1 2000 22:28:51 (EST)
Operating system: Windows NT Workstation 4.0.1381 Service Pack 4 (1 Processor -
255 MB Memory)
Code page (ANSI): 1252

Running as a service: Yes
Maximum number of concurrent connections: 256
Working directory: d:\bin\emsrv\data
Authentication: Disabled

Logging level: Error
Log file name: emsrv.log

Allow connection to truncate repositories: No
Track EMSRV statistics: Yes
Track process file locking statistics: No
Process activity timeout value: 360 sec
Sleep on lock value: 1000 ms

```

```
| Free disk space warning threshold: 10000 KB
| Restrict repositories to local filesystems: Yes
| =====
```

---

## Displaying current EMSRV statistics (stat command)

The stat command displays the statistics for operations completed since the repository server was started. This command also tells you what the current EMSRV working directory is.

The stat command sends a message to a host running EMSRV and requests a copy of the latest statistics. This command provides information such as numbers of file opens, closes, and writes.

The syntax for the stat command is:

```
EMADMIN stat [ <host> ]<-P<port number>]
```

### Parameter

<host>

### Description

Specifies the host name or IP address of the server where EMSRV is running. If you don't specify a host, the default is the name of the host from which you are issuing the emadmin command.

-P <port number>

This is an optional parameter that specifies the port that EMSRV is using. The default number is 4800.

For example:

```
EMADMIN stat emsrv.ibm.com
```

Running this command produces output such as the following:

```
| =====
| EMSRV 7.0 for Windows NT/2000 Aug 1 2000 22:28:51 (EST)
| Operating system: Windows NT Workstation 4.0.1381 Service Pack 4 (1 Processor -
| 255 MB Memory)
| Code page (ANSI): 1252
|
| Total Connects:                398 Total Disconnects:                393
| Total Opens:                   1720 Total Closes:                   1696
| Active Locks                   0 Unexpected Connection Closes:       20
| Total Locks:                   675831 Total Unlocks:                 675830
| Total Reads:                   3436990 Total Writes:                 636179
| Total Reads Failed On Lock:    0 Total Locks Failed On Lock:    0
| Times Lock Limit Hit:         0
| Total Requests Serviced:      6009719 Requests in last interval:    0
| Largest Packet Sent:          32780 Largest Packet Received:    32784
|
| Working Directory : d:\bin\emsrv\data
| Server Has Been Alive For: 17 Days 0 Hours 45 Minutes 18 Seconds
| =====
```

---

## Shutting down EMSRV stopping connections (stop command)

The stop command shuts down EMSRV remotely or closes a client connection to EMSRV. When you use this operation to shut down EMSRV, you are prompted for the EMSRV account password. The password characters are not displayed on the screen. EMSRV can be shut down only if you have entered the correct password. The stop command can also be used to terminate a connection that can no longer

communicate with the client. Use the `list` command to obtain the list of connections and their respective connection numbers that can be closed.

The `stop -k <connection number>` command is used to close a client connection to EMSRV.

The syntax for the stop command is:

```
emadmin stop <server_address> [ -k <connection_number> ] [ <host> ]
```

Parameter	Description
<server_address>	This optional parameter specifies the host that EMSRV is running on. The parameter can be either the server host name or its Internet address. If a host name is not provided, localhost is used.
-k <connection_number>	This required parameter is the unique connection number of the connection to be terminated.
<host>	Specifies the host name or IP address of the server where EMSRV is running. If you don't specify a host, the default is the name of the host from which you are issuing the emadmin command.

---

## Chapter 4. EMSRV for Windows NT® and Windows 2000

---

### Setting up EMSRV for Windows NT/2000

If you are going to use VisualAge Smalltalk for team development, linking several application programmers to one central code repository, the Manager Library, you will need to use EMSRV. The EMSRV code is installed when you install the Manager Library.

Before you start EMSRV for Windows NT/2000, perform the following steps:

1. Verify that TCP is installed and correctly bound to a network adapter. You can verify the binding by using the ping utility to communicate with the Windows NT/2000 machine from a workstation on the LAN.
2. Verify that your library files reside on a local file system. Using EMSRV with library files on a remote file system is not supported.

---

### Authorizing the EMSRV User on Windows NT/2000

EMSRV uses an existing Windows NT/2000 account to provide file access restrictions. The Windows NT/2000 account name used by EMSRV is referred to as the **EMSRV account name**, and the password for that account is referred to as the **EMSRV account password**. Both the Windows NT/2000 account from which EMSRV is started (that is, if EMSRV is not started as a service) and the EMSRV account must be granted the advanced user right **Act as part of the operating system** and be a member of the Administrators group.

The following steps cover how to set and activate this right for Windows NT:

1. Log on as Administrator.
2. Run the User Manager utility by selecting **Administrative Tools (Common) → User Manager** from the **Start** menu.
3. Select the EMSRV user and then select **Policies → User Rights**. The User Manager window opens.
4. From the **Policies** menu, select **User Rights**. The User Rights Policy window opens.
5. Select the check box **Show Advanced User Rights**.
6. From the **Right** drop-down box, select **Act as part of the operating system**.
7. Select the **Add** push button and add the EMSRV user to the list.
8. Select **OK** to save your choices and close the open windows.
9. Log off from the Administrator account and log on again as the EMSRV user.

Use the following directions to set and activate this right for Windows 2000:

1. Log on as Administrator.
2. Run the User Rights Assignment utility by selecting Administrative Tools from the Control Panel.
3. Select **Local Security Policy → Local Policies → User Rights Assignment → Act as part of the operating system**.
4. Click on the **Add** push button and add the EMSRV user to the list.
5. Click on the **Add** push button to add the user and save your choices.
6. Log off from the Administrator account and log on again as the EMSRV user.

For Windows 2000 Server, the **Local Security Policy** may be overridden by the **Domain Controller Security Policy** or the **Domain Security Policy**. User rights for the domain controller and/or domain may need to be set in order for the **Effective Policy Setting** in the **Local Security Policy** to appear checked.

For Windows 2000 Advanced Server, there is no **Local Security Policy**. Assign the right for the **Domain Controller Security Policy** and **Domain Security Policy** as necessary.

Authentication for the EMSRV account is slightly different when authenticating clients. In each case, additional user rights may be required for successful operation.

- To start and stop EMSRV as a service, both the account from which EMSRV is started and the EMSRV account must have the **Log on as a service** user right assigned. For each account, you must also ensure that the **Deny logon as a service** right is not set.
- To start and stop EMSRV interactively or from a batch file, both the account from which EMSRV is started and the EMSRV account must have the **Log on locally** user right. For each account, you must also ensure that the **Deny logon locally** right is not set.
- Each client authenticated by EMSRV must have the **Access this computer from the network** right set for the account used by that client. For each account, you must also ensure that the **Deny access to this computer from the network** right is not set.

---

## Starting EMSRV for Windows NT/2000 from the command line

Perform the following steps to start EMSRV for Windows NT/2000 from the command line:

1. Change directory to the directory containing the EMSRV executable (as specified previously in "Setting up EMSRV for Windows NT/2000" on page 33).
2. At the command line, enter `emsrv` with the desired parameters (see "EMSRV Startup options" on page 45).

For example, at the NT/2000 command line enter:

```
emsrv -u EMSRVUSER -p swordfish -W d:\path -w
```

This command does the following:

- Loads EMSRV with EMSRV account name EMSRVUSER and password swordfish
- Sets the working directory to `d:\path`. The working directory is where EMSRV writes a log file.
- Turns on lock tracking

---

## Starting EMSRV as a Windows NT/2000 service

The following steps cover how to install EMSRV as a Windows NT/2000 service. See "Troubleshooting EMSRV as a Windows NT/2000 service" on page 36 for a listing of common problems and solutions when running EMSRV as a Windows NT/2000 service.

1. Enter `emsrv -install <parameters>`. The optional `<parameters>` are EMSRV parameters such as `-u <user name>`, `-p <password>`, and so on. (For a list of available parameters, see "EMSRV Startup options" on page 45.) These parameters are fixed and will be used every time EMSRV is started as a service.

Ensure that `-install` is the first parameter. This installs EMSRV as a service in the registry and copies the necessary DLLs to the system directory. If there is an older version of EMSRV already installed, it removes the older version and installs the new version.

2. Start EMSRV as a service by using one of the following methods:
  - a. Starting EMSRV as a service using the Service control panel
    - 1) Open the Control Panel and double-click the **Services** control panel.  
  
**Note:** On Windows 2000, you access the Services control panel via the **Administrative Tools** icon within the Control Panel.
    - 2) Select the EMSRV Service in the **Services** control panel.
    - 3) Select **HW Profiles** and verify that a configuration is enabled. Enable one if necessary.
    - 4) Select **Start** and EMSRV will start as a service. (Selecting **Stop** will stop the service and close all connections.)
  - b. Starting EMSRV as a service using the Service Controller utility `sc.exe`
    - 1) Enter `sc start EMSRV -u <user name> -p <password>` at a DOS command prompt.
    - 2) Query the service status by entering `sc query EMSRV`.

To stop the service, enter `sc stop EMSRV`.

**Note:** `sc.exe` is available with the Windows NT/2000 Resource Kit.

- c. Starting EMSRV automatically at Windows NT/2000 startup:
  - 1) Go to the **Services** control panel.
  - 2) Select EMSRV and press the **Startup** button.
  - 3) Select **Automatic** for the startup type.

To remove the EMSRV Service from the registry, enter `EMSRV -remove` at a DOS command prompt. Alternatively, you can remove it by entering `sc delete EMSRV`.

The `-remove` option will stop the service if it is running as well as delete it from the registry.

## Guidelines for running EMSRV as a Windows NT/2000 service

Following are some guidelines for running EMSRV as a Windows NT/2000 service:

- Run EMSRV from the directory of the executable.
- The EMSRV service does not need to interact with the Desktop.
- Error messages about startup and low disk space are written to the Windows NT/2000 Event Log.
- The stop command will stop the service, closing all active connections without warning.
- Parameters entered at the **Services** control panel are ignored. Enter all parameters when installing with the `-install` option.

---

## Troubleshooting EMSRV as a Windows NT/2000 service

This section describes common problems when running EMSRV as a Windows NT/2000 service and their solutions.

### Problem

The error message An internal Windows NT error has occurred appears at startup

Normal EMSRV (not a service) hangs on startup

The error message The specific service is disabled and cannot be started appears at startup

The start button is disabled

The error message The service did not start due to a logon failure appears at startup

The error message The process terminated unexpectedly appears at startup

### Solution

Open the **Services** control panel. Verify that the startup parameters are entered correctly and the user name is a valid user on the server. The **-u** option is always needed to start the server.

EMSRV must be run in the directory of the executable. It will pause for about 1 minute if it is run with no arguments from a different directory.

From the Control Panel, select **Services** and then the **HW Profiles** button. Select the **Original Configuration**. If its status is disabled, enable it by selecting the **Enable** button.

The service could already be running on the local machine. Otherwise the service could be disabled. Select **EMSRV Service** in the **Services** control panel. Select **Startup** to open the Service window. Select **Automatic** or **Manual** for **Startup Type**.

An invalid password was entered in the Service window of the **Services** control panel, which you access by selecting **Startup**. Open the Service window and change the password or log on as the System Account. EMSRV could already be running in normal mode (that is, not as a service) on the local machine. This instance must be stopped for EMSRV to run as a service.



---

## Chapter 5. EMSRV for OS/2

---

### Setting up EMSRV for OS/2

Before you start EMSRV for OS/2, perform the following steps:

1. Verify that you are running either OS/2 version 3.0 or 4.0.
2. Verify that TCP is installed and correctly bound to a network adapter. You can verify the binding by using the ping utility to communicate with the OS/2 EMSRV computer from a workstation on the LAN.
3. Verify that your library files reside on a local file system. Using EMSRV with library files on a remote file system is not supported.

---

### Starting EMSRV for OS/2

EMSRV for OS/2 does not require a logon account to start. A password may be provided to protect against unauthorized shutdown.

Perform the following steps to start EMSRV for OS/2:

1. Change directory to the directory containing the EMSRV executable (as specified previously in "Setting up EMSRV for OS/2").
2. At the OS/2 command line, enter `emsrv` with the desired parameters (see "EMSRV Startup options" on page 45).

For example, at the OS/2 command line enter the following:

```
emsrv -p swordfish -W c:\manager -lc
```

This command starts EMSRV with the working directory `c:\manager` and logs messages to the console.



---

## Chapter 6. EMSRV for NetWare

This section describes how to set up, start, and use EMSRV for NetWare.

EMSRV for NetWare uses one thread per client connection and therefore scales more readily to support a greater number of connections than EMSRV for OS/2 or any of the EMSRV UNIX implementations, which use one process per client connection.

Paths to libraries accessed via EMSRV for NetWare must be specified as a NetWare path, relative to the EMSRV working directory (specified at the command line) and may include a NetWare volume name such as SYS. It is not possible to access a library residing on a remote server. Each NetWare server that has volumes containing libraries to be accessed must be running a copy of EMSRV for NetWare.

When using EMSRV for Netware, long filenames may only be created and viewed on NetWare volumes to which the LONG or OS/2 namespace has been added.

It is recommended that the NetWare Minimum Patch List be applied to the server running EMSRV for NetWare. The various files may be obtained from Novell's website at:

<http://support.novell.com/search/patlst.htm>

---

### Setting up EMSRV for NetWare

Before you load the EMSRV NLM, perform the following steps:

1. Verify that your file server is running a supported version of NetWare. EMSRV requires one of these versions of the NetWare operating system NLMs.

**Note:** Do not load EMSRV for NetWare on servers running NetWare SMP, or the server may stop responding.

2. Verify that the NetWare TCPIP NLM is loaded and correctly bound to a network adapter. You can verify the binding by using the ping utility to communicate with the NetWare file server from a workstation on the LAN. When EMSRV for NetWare is started, if this NLM is not loaded, it will automatically load. EMSRV for NetWare will also automatically load the NWSNUT.NLM which is required by the EMSRV for NetWare user interface.

---

### Starting EMSRV for NetWare

The EMSRV NLM logs on to the NetWare file server using an existing NetWare account and password to provide file access restrictions. The NetWare account name used by EMSRV is referred to as the **EMSRV account name**, and the password for that account is referred to as the **EMSRV account password**.

When you load the EMSRV NLM, you must supply it with the EMSRV account name, the EMSRV account password, and a working directory. You can supply this information using command-line parameters. If you do not supply this information, the NLM prompts you as it loads.

Perform the following steps to start EMSRV NLM:

1. Bring the NetWare server up for multiple users.

2. Ensure that TCP/IP has been started and that you can ping the server.
3. Change directory to the directory containing the EMSRV executable, sys:\system (as specified previously).
4. Start EMSRV. At the file server console, enter load emsrv with the desired parameters (see “EMSRV Startup options” on page 45).

For example, at the file server console enter:

```
load emsrv -u EMSRVUSER -p swordfish -W volname:\path -sc context
```

This command does the following:

- Loads the NLM with the EMSRV account name EMSRVUSER and password swordfish.
- Sets the working directory to volname:\path.

**Note:** You can add an appropriate command line to the file server autoexec.ncf file to automatically load NLM when the NetWare file server is rebooted.

---

## Operating EMSRV for NetWare

This section describes ways to operate EMSRV for NetWare.

### Console screens

EMSRV creates two console screens:

#### Menu Screen

Used to observe and change EMSRV settings.

#### Message Screen

Displays log messages according to the specified reporting level.

Context-sensitive help may be viewed at any time by pressing F1.

### Menu choices

Through the Menu Screen you can perform the following operations:

- Change settings.
- View connections.
- View the message screen.
- View EMSRV statistics.
- Shut down EMSRV.

### Changing settings

When you select **Change Settings**, a form is displayed that you can view and edit. To exit the form and save the changes (which implements them), press **Esc**.

The following table describes each form field and lists the corresponding startup option, if one exists, and the default value.

Field	Description	Startup option (default)
<b>Maximum Number of Connections</b>	Displays the maximum number of connections allowed by EMSRV.	-w ( <i>default: 256</i> )

<b>Logging Level</b>	Displays the current reporting level. To change the reporting level, press <b>Enter</b> to access a pop-up menu.	-s0 (logs all operations)  -s1(logs warning and error messages)  -s2 ( <i>default</i> : logs only error messages)
<b>Log to a File</b>	Specifies whether EMSRV logs to a file.	-lf <file name>
<b>Log File Name</b>	Specifies the log file to which EMSRV writes.	-lf <file name>
<b>Allow Libraries to be Truncated</b>	Specifies whether users are allowed to truncate existing libraries.	-t ( <i>default</i> : yes)
<b>Client Password Verification</b>	Specifies whether client password verification is disabled, whether native NetWare passwords are used, and whether the passwd.dat file is used. To change the style of password verification, press <b>Enter</b> to access a pop-up menu.	-rn (rejects users who do not supply a valid NetWare user name and password)  -rd ( <i>default</i> : disables password checking for clients)  -rp (rejects users who are not in the passwd.dat file)
<b>Statistics Recorded per Screen Update</b>	Specifies the number of statistics that must change before EMSRV updates its statistics screen. The higher you set this number, the better EMSRV performance you will get.	( <i>default</i> : 1000)

## Viewing connections

Select **View Connections** to display a list of client connections. You can scroll through the list to select a specific connection. After selecting a connection:

- Press **Enter** to display its statistics.
- Press **Delete** to terminate the connection.
- Press **Esc** to return to the menu.

To display EMSRV statistics, select **EMSRV Statistics** from the Menu Screen.

## Viewing the message screen

Select **View Message Screen** from the Menu Screen to display the Message Screen. To return to the Menu Screen, press **Esc**.

## Viewing EMSRV statistics

Select **EMSRV Statistics** from the Menu Screen to display EMSRV statistics that have been accumulated since the EMSRV NLM was started.

You typically display EMSRV statistics after displaying connection statistics using **View Connection List**.

To force a screen update, select **EMSRV Statistics** if the EMSRV statistics are currently displayed.

## EMSRV for NetWare messages and reporting

To change the reporting level from the NetWare console while EMSRV is running:

1. Select **Change Settings** from the Menu Screen.

2. Select **Reporting Level**.
3. Press **Enter**.

When debugging an EMSRV problem, it is often useful to watch the write operations to the Message Screen as they occur. To do this, switch to the Message Screen after setting the reporting level.

## Shutting down EMSRV on NetWare

You cannot unload EMSRV for NetWare using the unload command at the file server console. You can unload it only from the Menu Screen or by running EMADMIN. (For information on using EMADMIN, see "Chapter 3. The EMADMIN utility" on page 27.)

Do not unload EMSRV for NetWare if library transactions are in progress. If you do, the library may be left in an inconsistent state.

The following steps describe how to safely unload EMSRV:

1. Verify that all VisualAge users that were connected to EMSRV have disconnected. To verify this, select **View Connection List** from the Menu Screen or use EMADMIN.
2. If there are connections, terminate them by selecting **View Connection List** from the Menu Screen and pressing **Esc**.
3. Unload the EMSRV NLM by using EMADMIN or the Menu Screen. From the Menu Screen, select **Shutdown EMSRV** to shut down and unload the EMSRV NLM. You must enter the EMSRV account password before EMSRV will unload.

## Loading the NLM on NetWare 4.11 and NetWare 5.0

EMSRV no longer supports NetWare 4.11 or NetWare 5.0, but EMSRV can be run on those platforms if additional steps are taken. CLIBAUX.NLM must be loaded before the EMSRV NLM is loaded. CLIBAUX.NLM is included with Novell's NetWare 4.11/4.2 Support Pack 8a, but is also available separately from Novell in the file CLIBAUX1.EXE, which can be found at the following location:

<http://support.novell.com/cgi-bin/search/download?pub/updates/nw/nw42/clibaux1.exe>

## Files not needed in this release

In previous releases of EMSRV for NetWare, two additional files - EMSRV.HLP and EMSRV.MSG were required along with the NLM. These files are no longer needed as they have been bound into the NLM.

---

## Chapter 7. EMSRV for UNIX operating systems

---

### Setting up EMSRV for UNIX operating systems

Before you start EMSRV for UNIX, perform the following steps:

1. Verify that you are running one of the supported UNIX operating systems.
2. If you are using Linux: Copy the executable files from the `\linux` subdirectory on the distribution CD to `/opt/IBMvast/5.5/bin` on the server machine

### Determining Local Device Numbers

By default, EMSRV on UNIX permits access to libraries only on certain known local file systems. This is done to avoid corruptions which can occur when libraries are stored on networked file systems. If you intend to locate libraries on a file system that is not recognized by default, you must specify an `-xd` option for that file system. If you do not, your clients will receive a "File resides on an unsupported device" error when they try to open a library.

`emdevnum` is a utility which retrieves the major device ID for the file system of a specified file. The device number reported may then be used with the `emsrv -xd` startup option.

EMSRV does not have to be running in order to use `emdevnum`.

#### Syntax

`emdevnum <file or directory name>`

#### Example

```
emdevnum /opt/IBMvast/5.5/manager/mgr55.dat
emdevnum /opt/IBMvast/5.5/manager
```

A typical response might be:

The device number is 21

**WARNING:** The `-xd` option can bypass checking for a remote file system. If a library is located on a remote file system (or even a local file system mounted using a remote protocol), the library can become corrupted. Make sure that devices specific with `-xd` are local to the machine running EMSRV and are not from mounted remote file systems like NFS.

Accessing libraries on remotely-mounted volumes such as those hosted by NFS may result in library corruptions. This is due to the fact that some remote file system software cannot guarantee the integrity of a file when multiple clients are updating it. Although EMSRV uses locks to serialize access to regions of a library, some locking implementations of NFS, for example, use UDP, which does not guarantee delivery or the sequence of transmissions.

On many platforms, NFS file systems return an unusual value (such as 0 or 65535) to `emdevnum`. However, even if the major device ID appears to be a reasonable value, check to make sure that device is local to the machine running EMSRV before specifying it with the `-xd` parameter.

---

## Starting EMSRV for UNIX operating systems

On UNIX platforms, the EMSRV process will have the file access permissions of the UNIX account that starts EMSRV. The UNIX account name that is used to start EMSRV is referred to as the **EMSRV account name**, and the password for that account is referred to as the **EMSRV account password**.

Perform the following steps to start EMSRV for UNIX:

1. Change directory to the directory containing the EMSRV executable (as specified previously in “Setting up EMSRV for UNIX operating systems” on page 43).
2. Verify that:
  - The EMSRV user account has appropriate file access rights to the library files.
  - The library files reside on a local file system.
3. Determine whether your UNIX system is using shadow passwords and choose the correct binary (see “Authentication on UNIX Platforms” on page 18).
4. At the command line, enter either `emsrv.shadow` or `emsrv` as appropriate with the desired parameters (see “EMSRV Startup options” on page 45).

For example, at a command line, enter either: `emsrv.shadow -w -xd21 -xd24 -lc -lflogfile` or `emsrv -w -xd21 -xd24 -lc -lflogfile`.

The command does the following:

- Starts EMSRV with lock tracking turned on
- Logs messages to the system console and the log file specified in the command line
- Allows libraries to be accessed on the default (boot) device and devices with major device IDs 21 and 24.

**Note:** The UNIX account password is needed when shutting down EMSRV remotely using EMADMIN.



## EMSRV Startup options

Platform	Operating Systems Included
Netware	Netware
OS/2	OS/2
UNIX	HP, Sun, AIX, Linux
Win	Windows 2000, Windows NT
All Platforms	AIX, HP, Netware, Linux, OS/2, Sun, Windows 2000, Windows NT

The following table lists and describes EMSRV startup parameters.

Parameter	Platform	Description
-A<0,1>	All platforms	The file system requires read locks. The default setting is 0, which indicates the file system does not need read locks.
-a<seconds>	UNIX	Sets the number of seconds before a connection is deemed inactive. The default is 360 seconds.
-b<Kilobytes>	All platforms	Sets the low-volume threshold warning in kilobytes. The default is 10,000 kilobytes. If the available disk space is less than the low-volume threshold, EMSRV will log warning messages to the log file.
-f	UNIX	Sets EMSRV to run in the foreground.
-h	All platforms	Displays the help text that lists the valid options.
-i<q,t>	UNIX	Ignores signals. <q> = ignore SIGQUIT; <t> = ignore SIGTERM. By default, either of these signals cause EMSRV to terminate.
-install	Win	Installs EMSRV as a service.
-lc	OS/2, Win, NetWare	Logs messages to the console. By default, messages are not written to the console.
-lf<name>	OS/2, Win, NetWare	Writes the log to file <name>. By default, the log is written to emsrv.log. The file <name> must specify a valid path for which the EMSRV account has sufficient access rights.
-lp<seconds>	UNIX	Sets the maximum number of seconds to wait for a lock. The default is 15 seconds.
-ls	UNIX	Logs messages to stdout instead of a log file. EMSRV must be run in the foreground using the -f option if -ls is used.
-lt<seconds>	UNIX	Sets the maximum number of seconds to hold a lock.
-M<number of connections>	All platforms	Specifies the maximum number of connections that can be established with EMSRV. The default is 256.  To start EMSRV with a maximum of 80 client connections, use the following parameter: load EMSRV -M80
-n	UNIX	Turns off statistics gathering.

-P<port number>	All platforms	<p>Specifies the port number that the EMSRV process uses. The default is 4800.</p> <p>To start EMSRV using port number 4899, use the following parameter: load EMSRV -P4899</p> <p>If you need to change the port number on the client and do not know how, contact customer support.</p>
-p <password>	OS/2, Win, NetWare	<p>Specifies the password for the EMSRV user account and restricts library file access. This password is used for EMADMIN functions, such as shutting down EMSRV remotely. Refer to the section "The EMADMIN utility" for information on EMADMIN functions.</p> <p>For NetWare, you must specify -p without the password parameter if the EMSRV account has no password.</p>
-R<0,1>	All platforms	The file system releases locks on file close. The default setting is 1, which indicates the file system releases locks when files close.
-r	UNIX	Rejects users who are not in the passwd.dat file.
-rd	OS/2, Win	Disables password checking for clients. This is the default setting.
-remove	Win	Removes the EMSRV service from the Registry.
-rn	Win, NetWare	Rejects users who do not supply a valid EMSRV user name and password. The default grants access to users without an EMSRV user name and password.
-rp	OS/2, Win, NetWare	Rejects users who are not in the passwd.dat file. The default grants access to users who are not in the password file.
-s<0, 1, 2>	All platforms	Sets the reporting level to the specified severity level (0, 1, or 2). See the section following, "EMSRV messages and reporting," for a description of severity levels. The default is 2 (log error messages only).
-sc	NetWare	Sets the NDS context for EMSRV to <context>. Consult your NetWare documentation for information on setting NDS contexts.
-t	All platforms	Protects existing files from truncation. By default, files are created over existing ones; that is, the existing file is truncated to 0 length.
-u <user name>	Win, NetWare	Specifies the EMSRV account name to be used.
-v	UNIX	Verifies password using system authentication.
-W <path>	OS/2, Win, NetWare	Specifies the EMSRV working directory. The directory <path> must be a valid path for which the EMSRV account has sufficient access rights to read, write, or both.
-w	All platforms	Specifies that EMSRV should track locks for each connection.

<code>-xd &lt;devnum&gt;</code>	UNIX	<p>This parameter allows EMSRV to open libraries on devices other than the default hard drive. A maximum of 15 devices may be specified. If you intend to locate libraries on a hard drive other than the boot drive, you must specify an <code>-xd</code> option for each other hard drive. If you do not, your client will generate the error “File resides on an unsupported device”.</p> <p><b>Warning:</b> The <code>-xd</code> option can bypass checking for a remote file system. If a library is located on a remote file system (or even a local file system mounted using a remote protocol), the library can become corrupted. Make sure that devices specified with <code>-xd</code> are local to the machine running EMSRV and are not from mounted remote file systems like NFS.</p>
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---

## EMSRV messages and reporting

EMSRV contains comprehensive diagnostics. Based on the specified reporting severity level and whether file logging is enabled, statistics and diagnostic information are logged to the `emsrv.log` file and displayed on the console (or on the EMSRV for NetWare Message Screen). All messages with a severity level lower than the current level are suppressed. You can set the level when you start EMSRV, and you can change it dynamically, using the EMADMIN utility. The reporting levels are as follows:

### Reporting level

	Description
0	Logs all operations
1	Logs warning and error messages
2	Logs only error messages (default)

**Note:** When debugging an EMSRV problem, it is often useful to watch the write operations to the console or Message Screen (on NetWare) as they occur. To do this, choose the EMSRV startup options to log to the console and set the appropriate reporting level.

There are three categories of EMSRV messages:

- Information
- Warnings
- Errors

During normal operation, you should set the reporting level to “Errors” (reporting-level 2), because performance is affected when large amounts of information are written to the screen or log file. Set the reporting level to “Information” only when you are trying to diagnose a problem.



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