

# INSTALLATION AND OPERATIONS GUIDE

MSC.Dytran

Version 4.7 for Windows NT 4.0

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DT\*V4.7\*Z\*Z\*WNT\*DC-OPS

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# Preface

“MSC.Software provides quality engineering software and related support services for the long term.”

This document provides basic instructions for installing, configuring, and running MSC.Dytran Version 4.7 on Microsoft Windows NT. It should be read by system administrators or anyone who is going to perform the installation. MSC.Dytran users will benefit from reading the chapters on configuring and running MSC.Dytran Version 4.7.



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# Introduction and Overview

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## 1.1 Who Should Read This Guide

MSC has designed this manual to guide system administrators and users through the installation of MSC.Dytran for Microsoft Windows NT 4.0. The installation instructions assume that you have a basic knowledge of Microsoft Windows NT 4.0. Administrator level access is required for installation of the licensing system, and will likely be necessary to access installation directories during the installation of the MSC.Dytran software.

---

## 1.2 Overview of the MSC.Dytran System

The MSC.Dytran Version 4.7 software system consists of the MSC.Dytran solver and a graphical user interface for running MSC.Dytran analysis. For the basic MSC.Dytran installation procedure, see Chapter 3, [Installing MSC.Dytran](#).

### 1.2.1 FLEXIm

MSC.Dytran uses the FLEXIm licensing system. FLEXIm functions as a distributed license system or as a stand-alone nodelock license server.

For the Basic FLEXIm installation instructions, see Section 3.5, [FLEXIm Installation \(Optional\)](#). For other issues and questions, please consult the Globetrotter documentation at their web site, <http://www.globetrotter.com>.

## 1.2.2 Year 2000 Compliance

To ensure the viability of MSC.Dytran operational integrity, security, and authorization systems as they relate to Year 2000 compliance, we have conducted tests on MSC.Dytran Version 4.7 for the Windows NT environment. Full official certification has been established from the results of these test.

The results of the tests we have completed indicate that:

- MSC.Dytran Version 4.7 for Windows NT is authorized to operate over a supported date range extending from January 1, 2000 and encompassing a time period reasonably suitable for the intended use of the product. This includes the critical moment of February 29, 2000.
- MSC.Dytran Version 4.7 for Windows NT reads and transfers dates correctly, for example, in print files, message files, and results.
- Date stamping, although not four characters, is correct, valid, and will not lead to ambiguity in interpretation of data.
- MSC.Dytran Version 4.7 for Windows NT does not perform date calculations.

Please note that MSC.Dytran Version 4.5 and prior versions are not Year 2000 compliant.

---

## 1.3 Documentation Conventions

This guide uses the following font styles to denote computer file names, system messages, and user input:

- File names appear in a plain Courier font (e.g., `C:\msc\flexlm`).
- System messages or prompts also appear in a plain Courier font and appear on a line by themselves:

```
-r--r--r--  1 bin      bin          40 Nov  2  1991 .pwrshd
```

- User inputs are in a bold Courier font and are usually set off on a line by themselves:
- ```
# <install_folder>\flexlm\lmutil lmdiag -c <license_file_path>
```
- The “#” command prompt indicates that someone with administrator access must enter the command.
  - The “%” command prompt indicates that a common user can enter the command.
  - Command parameters shown in italics indicate where you must substitute an appropriate item or text string.



- This guide uses input conventions as shown in this table.

| Description            | Text String          | Definition                                                                                                                                                                       |
|------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Return Key</b>      | <cr>                 | The return key is not usually shown in the commands. Assume that you must press the return key after typing a command or other input to the system, unless instructed otherwise. |
| <b>Control Key</b>     | <Ctrl-z><br><Ctrl-c> | This means you must type the letter while holding down the Control (Ctrl) key. For example, <Ctrl-z> means hold down the Control key and type the letter z.                      |
| <b>Bracketed Items</b> | [ ]                  | Any parameter enclosed in square brackets is optional.                                                                                                                           |
| <b>Ellipses</b>        | .<br>.<br>.          | A vertical ellipsis indicates that part of the format or example has been omitted.                                                                                               |

### 1.3.1 Directory Path Convention

Enclosing a descriptive name in angle brackets indicates a reference to a user-defined path, such as the directory chosen for product installation. Additionally, product directories may include an “x” in the place of decimal version numbers. For example,

```
<install_folder>\dytranxx\dytranexe
```

In this case, <install\_folder> refers to the directory chosen during the installation process, see Chapter 3, [Installing MSC.Dytran](#). For example, if you chose D:\msc as the installation folder for MSC.Dytran Version 4.7, the above path would be equivalent to:

```
D:\msc\dytran47\dytranexe
```



# Required Hardware and Software Configurations

## 2.1 RAM, Swap, and Disk Space

MSC.Dytran hardware requirements vary according to model size and the actual functions that you execute. Solvers or other software that run concurrently with MSC.Dytran increase RAM, swap, and disk space requirements.

Total memory is the sum of swap space and RAM. A given process requires a minimum amount of total memory. If the minimum memory to execute a process is higher than the total memory available, MSC.Dytran typically generates memory or memalloc errors.

Since RAM is very fast compared to the disk-based swap, more RAM generally translates into better performance.

Table 2-1 shows disk space, swap and RAM guidelines for small, medium, and large analysis models. MSC.Dytran may actually run with fewer resources than shown, but we recommend these minimums for practical use of MSC.Dytran.

**Table 2-1. Disk Space and Memory Requirements.**

|                                     | Small Models | Medium Models | Large Models |
|-------------------------------------|--------------|---------------|--------------|
| Random Access Memory (RAM) per user | 128 MB       | 256 MB        | 512 MB       |
| Scratch Disk Space (/tmp)           | 50 MB        | 100 MB        | 200 MB       |

Note: The amount of disk space required for the installation is about 100 MB. Analysis results storage space is dependent upon the amount of results data a user requests to be saved. For extremely large problems where many variables and time steps are saved, up to 1 GB of storage space may be required. For small problems, 50 MB may be sufficient.

---

## 2.2 System Specific Requirements

MSC.Dytran Version 4.7 was developed and tested on the following Windows NT 4.0 hardware and software:

**Table 2-2. Windows NT Requirements.**

|                    |                                              |
|--------------------|----------------------------------------------|
| Hardware Platforms | Pentium II                                   |
| Operating Systems  | Microsoft Windows NT 4.0 with Service Pack 3 |
| Other              | Ethernet Card and Microsoft TCP/IP Service   |

### Tested Systems

MSC performed test installations of MSC.Dytran Version 4.7 on the following Intel-based Windows NT 4.0 computer systems:

- Compaq Deskpro
- Dell Precision 410
- Dell Latitude (laptop)
- Gateway GP6-400
- HP Vectra X86
- HP Omnibook 5700 (laptop)
- NEC Versa 4080 H (laptop)
- Siemens Nixdorf Celcius

MSC.Dytran Version 4.7 for Windows NT 4.0 should run on any Intel-based PC that is compatible with Windows NT 4.0.

Note: MSC.Dytran Version 4.7 for Windows NT 4.0 does not support Windows NT running on DEC Alpha-based workstations.

### TCP/IP Requirements

You must have the Microsoft TCP/IP networking service installed on Windows NT. MSC.Dytran Version 4.7 also requires an ethernet card, even if the workstation is not connected to a network. MSC.Dytran Version 4.7 uses the ethernet card to create a system ID for FLEXlm licensing.

# Installing MSC.Dytran

---

## 3.1 Overview

MSC.Dytran Version 4.7 on Windows NT uses a common installation procedure in which the MSC.Dytran Version 4.7 software and related products use the same installation Wizard. Many separate tasks have been combined into a single procedure to simplify the installation.

Administrator level access is required for installation of the licensing system, and will likely be necessary to access installation directories during the installation of the MSC.Dytran software.

---

## 3.2 TCP/IP Setup

Before the installation of MSC.Dytran Version 4.7 can be executed, you must have the TCP/IP networking service installed on your Windows NT. To check the TCP/IP network installation:

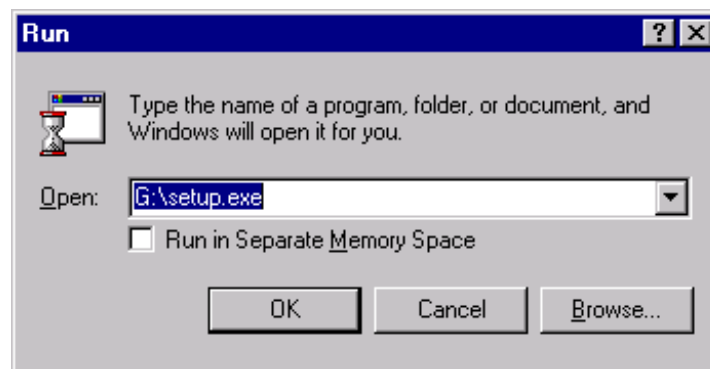
1. Open up the Control Panel.
2. Select the Network icon and the Protocols tab.
3. Check to see that the TCP/IP protocol is installed.

MSC.Dytran Version 4.7 also requires an ethernet card, even if the workstation is not connected to a network. MSC.Dytran uses the ethernet card to create a system ID for FLEXIm licensing.

## 3.3 Installing MSC.Dytran Version 4.7 with the Setup Wizard

Be sure to exit all programs before you begin the installation procedure.

1. Insert the MSC.Dytran Version 4.7 for Windows NT 4.0 CD in the CD ROM drive.
2. Depending on your machine's setup, the installation Setup Wizard will start automatically. If not you must start the installation Setup Wizard manually by:
  - Selecting **MyComputer** and double-clicking on the MSC.Dytran icon representing the CD in your CD ROM drive.or
  - Selecting **Run** from the **Start** menu. You should see the dialog box shown below on your screen:



Type **x:\setup.exe**, where x is your CD ROM drive. This starts the MSC.Dytran for Windows NT 4.0 installation Setup Wizard.

3. The Setup Wizard presents you with three choices:
  - Install MSC.Dytran (installs the software system).
  - Install FLEXlm (installs a FLEXlm license server or nodelock license file).
  - SYSTEM INFORMATION (provides system information).

MSC.Dytran Version 4.7 for Windows NT requires a FLEXlm server locally, or on the network, to supply licenses. You may wish to establish a FLEXlm server before installing MSC.Dytran.

The FLEXlm setup can be done after MSC.Dytran is installed. FLEXlm licenses are fully compatible between UNIX and Windows NT.

If you do not have a FLEXlm license, you must first run the FLEXlm install. See Section 3.5.3, [Obtaining an MSC.Dytran License File](#), for additional information.



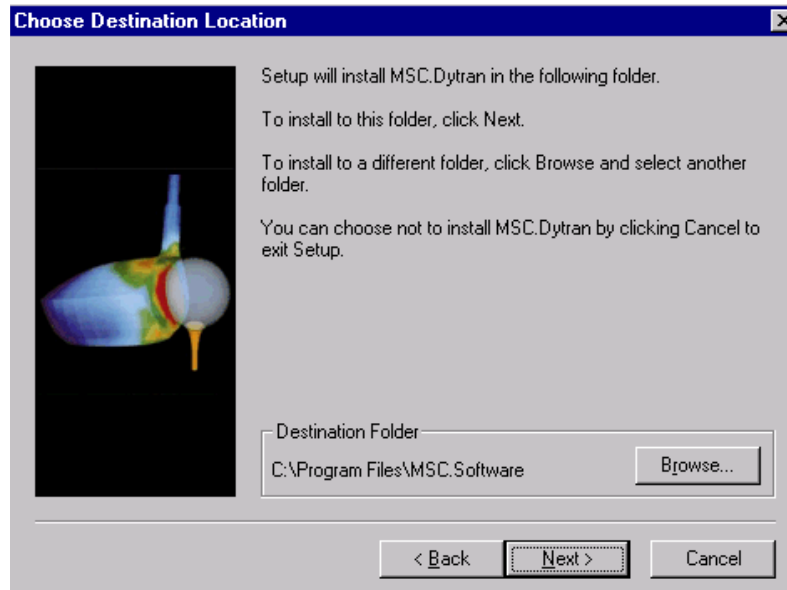
---

## 3.4 Installing the MSC.Dytran Software

1. On the Setup Wizard menu, select the **MSC.Dytran** button. The Setup Wizard will take you through the installation of MSC.Dytran.
2. Choose the installation folder. If you already have other MSC products installed on your Windows NT 4.0 machine, you can choose the same folder where those products are installed, e.g., a folder named `msc`.

## Installing MSC.Dytran

*Installing the MSC.Dytran Software*



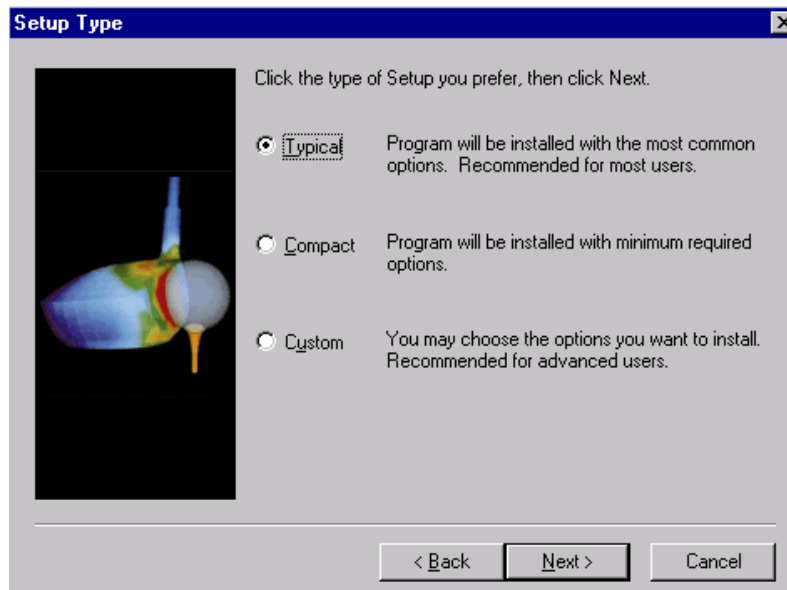
3. Select **Typical** to install the full MSC.Dytran software system with example problems. This is the recommended installation option;

or

Select **Compact** to install the MSC.Dytran software system only (without the example problems);

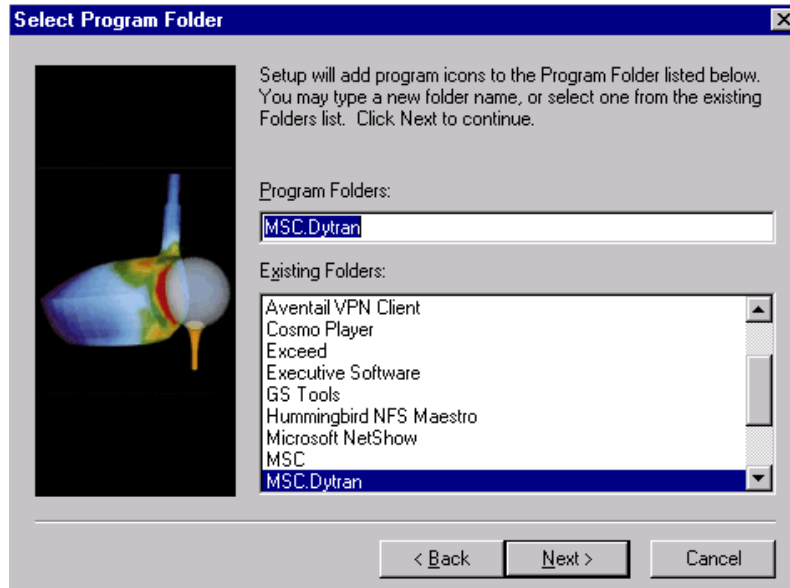
or

Select **Custom** if you want to choose to install the MSC.Dytran software system, the example files only, or both.





4. Choose the folder for the program icon. If you already have other MSC products installed on your Windows NT 4.0 machine, you can choose the same folder where those icons are installed, e.g., the folder named `msc`. By default the icon is installed in a folder named `MSC.Dytran`.



## 3.5 FLEXlm Installation (Optional)

### 3.5.1 Overview

MSC.Dytran for Windows NT 4.0 uses the FLEXlm licensing system. You need to have a FLEXlm server running on your Windows NT workstation, or on a UNIX workstation in the same TCP/IP network.

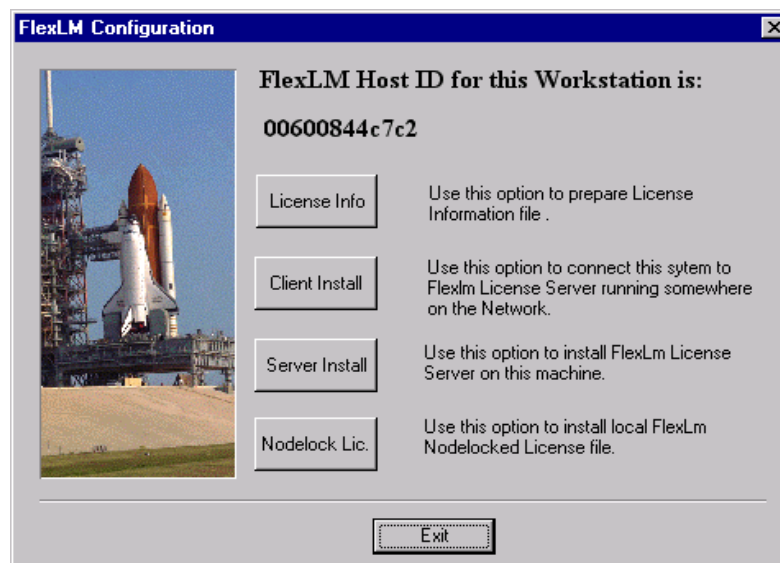
If you already have FLEXlm setup as a license server for MSC.Dytran or other MSC products, you do not need to install a new license server. You can use the existing license server by using a **Client Install** during the FLEXlm installation.

If you have other existing FLEXlm products from MSC and you want to use an existing FLEXlm license server, you need to integrate the new MSC.Dytran license information into the existing license file. See Section 3.5.4.2, [Check Paths and Server Names in the license.dat File](#).

The following steps are a simple summary of the FLEXlm installation as it pertains to MSC.Dytran. When MSC.Dytran executes, it locates the license file, `license.dat`, which tells it the name of the license server node and the port number over which to communicate with the license manager daemon, `lmgrd`.

### 3.5.2 Installing FLEXlm

Select **FLEXlm** from the main menu in the Setup Wizard. You should see the following screen:



- License Info – Creates an authorization form (mscauth.txt) to send to MSC.
- Client Install – Uses licenses from an existing FLEXlm server (UNIX or NT).
- Server Install – Installs the FLEXlm server (Note: You must first acquire an authorization code from MSC).
- Nodelock license.

### 3.5.3 Obtaining an MSC.Dytran License File

To obtain a license file from MSC, you need to determine the hostid of the machine that will function as your license server. You must use the Setup Wizard to obtain the hostid. This ID will be displayed at the top of the window when the **FLEXlm** button is selected on the Setup Wizard main window.

Use the Setup Wizard to create an Authorization Request Form by selecting **License Info** and by filling in the requested details. Send this form to your MSC sales representative to obtain your permanent license.

### 3.5.4 Installing Using a Server

#### 3.5.4.1 Place the License File on the Server

If you wish to start a FLEXlm license server on this workstation select **Server Install**. The Setup Wizard will prompt you for an existing `license.dat` file (supplied by MSC.Software), and will start the appropriate Windows NT services.

The Setup Wizard automatically installs the `license.dat` file when you provide it during installation.

The license file may be located anywhere on your license server. MSC recommends locating it in `<installation_dir>/flexlm/licenses/license.dat`.

If you have other existing FLEXlm products from MSC.Software, you need to integrate the new MSC.Dytran license information into the existing license file.

#### 3.5.4.2 Check Paths and Server Names in the license.dat File

Check that the `license.dat` file for your installation contains the correct server and port settings.

Below is an example of what you might get from MSC.Software, which needs to be updated by the FLEXlm installation, or manually by the user.

```
#----- Start of License File -----
# The authorization line length has necessitated display on multiple
# lines. A "\" is used to signify a line continuation. Please enter
# the codes exactly the way they are printed, including the "\"
# continuation character. The VENDOR_STRING field on a feature line must be
# entered on one line only, and not span more than one line.
SERVER UNKNOWN 00600844c7c2 1700
DAEMON MSC /user_defined_path/msc
FEATURE DYTRAN_Standard MSC 2000.0108 08-JAN-2000 1 4CB6E0D89E7C2BA7C377 \
ISSUED=08-JAN-1999 ck=85 SN=138725314
FEATURE DYTRAN_Basic MSC 2000.0108 08-JAN-2000 1 7CF660B8BD3A3BC7B5A6 \
ISSUED=08-JAN-1999 ck=131 SN=138725314
#----- End of License File -----
```

The first five lines are comments and can be removed or ignored.

The sixth line is the license SERVER line. This line will automatically be updated during the FLEXlm installation. For example, if the server name is heyboer, and port 1700 is free, this line will be changed to: SERVER HEYBOER 00600844c7c2 1700.

When you decide to change to another license server or when you get a new license file after expiration of an existing one, you can make this change by hand, taking into account the following guidelines:

- SERVER must be in uppercase letters, followed by the hostname, then the host ID, followed by the port the daemon will run on.
- The hostname of a Windows NT license server can be determined by selecting the System Information button on the main window of the Setup Wizard. The hostname is given under Node. Replace "UNKNOWN" with this hostname.
- The FLEXlm hostid should be correct. You can verify this on the main window of the Setup Wizard. If the FLEXlm hostid is not correct, new codes must be generated. If this is the case, you should contact your local MSC.Software sales office.
- The port defaults to 1700, but can be any free port. If you do not know which ports are free, use the default.

The seventh line is the DAEMON line. This line will also be automatically updated during the FLEXlm installation. When the FLEXlm installation folder is c:\msc, this line will be changed to DAEMON MSC c:\msc\flexlm\MSC.EXE. You can make this change manually, taking into account the following guidelines:

- DAEMON must be in uppercase letters, followed by MSC, which also must be in uppercase. This is followed by the path to the msc vendor daemon executable, which is in lowercase letters.
- The executable is found in the FLEXlm folder in the installation folder. If your installation directory is c:\msc, then the executable is found in c:\msc\flexlm.

### 3.5.5 Installing Clients to Access a Floating License

If you do not want to use the Windows NT 4.0 machine you are currently installing on as your license server, you must use the client access option of the FLEXlm installation.

- Select **Client Install** after selection of the **FLEXlm** button in the main window in the Setup Wizard. Set the FLEXlm license server under **HostName** as `<port>@<hostname>`.

### 3.5.6 Installing Using a Nodelock File

A FLEXlm nodelock license file differs from a network file with the addition of a hostid at the end of each FEATURE line.

If you have a temporary or demonstration license, it may be supplied as a nodelock `license.dat` file. Select **Nodelock** after selection of the “FLEXlm” button in the main window of the Setup Wizard.

### 3.5.7 Additional Documentation

MSC provides a FLEXlm End Users Guide in HTML format in the folder `<install_folder>/flexlm/flexuser/Ix.htm`. To view these documents you need an HTML compatible World Wide Web browser such as Netscape Navigator.

Note that we only provide the End User Guide.

To obtain additional information and information on auxiliary products such as FlexAdmin, visit the Globetrotter Web Page. If you have Internet access, set your browser to:

<http://www.globetrotter.com/>

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## 3.6 Testing the Installation

This section provides instructions on testing your installation of MSC.Dytran Version 4.7.

### Login and Change to a Scratch Directory

Login as a non-privileged user (that is, not administrator) on the Windows NT machine that will be running MSC.Dytran and change to a folder that has at least 50 MB of disk space.

### Testing the MSC.Dytran Version 4.7 Solver

1. Copy the file named `impulse_a.dat` from the MSC.Dytran Version 4.7 example problem folder `<install_folder>/dytran47/ExampleProblems/EP1_1`.

2. Start up the graphical user environment by double-clicking on the MSC.Dytran icon, as described in Section 4.1, [Running MSC.Dytran](#). Select `impulse_a.dat` as the input file, **Small** as the executable size and start the MSC.Dytran analysis.
3. The MSC.Dytran analysis will take 10 to 20 seconds to finish. You can check if the analysis was successful by double-clicking on the printed output file `IMPULSE_A.OUT` and scrolling to the bottom of the file. The following printout on your screen indicates that the analysis has run successfully:

```

*****
*
*           THE TIME LIMIT HAS BEEN REACHED           *
*
*           THE PROBLEM WILL NOW TERMINATE             *
*
*****

```

---


## 3.7 Uninstalling MSC.Dytran

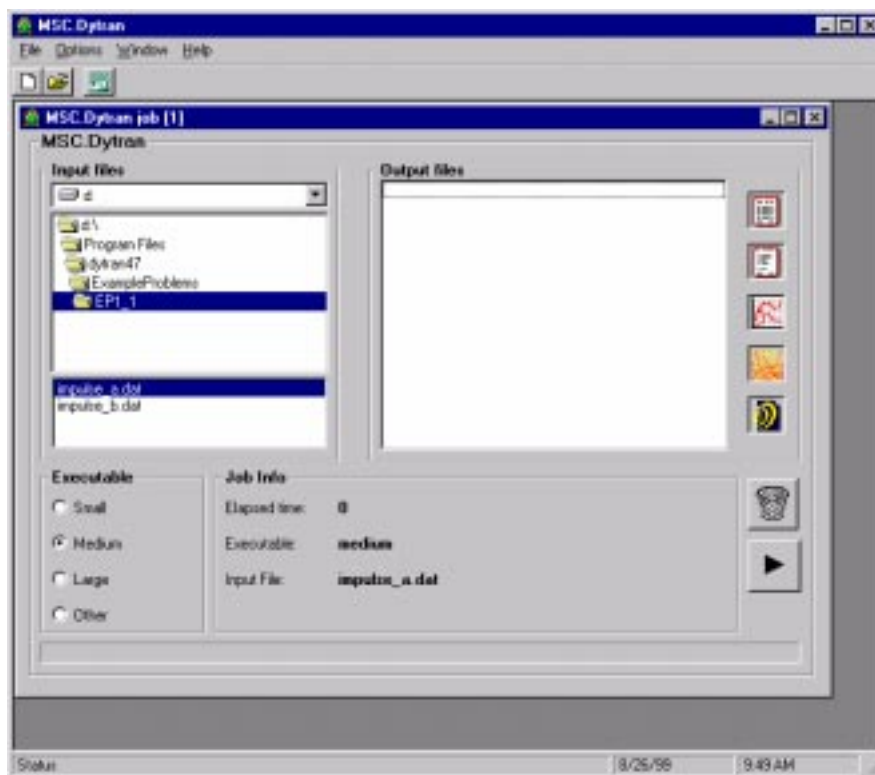
The following steps describe the uninstallation of the various components of the MSC.Dytran software system:

- To uninstall MSC.Dytran Version 4.7, use the uninstall icon in the MSC.Dytran program group.
- To uninstall FLEXIm, choose **Control Panel** → **Add/Remove Programs**, select **MSC/FLEXIm(Dytran)** in the scroll window, and apply the **Add/Remove** button.



# Using MSC.Dytran

## 4.1 Running MSC.Dytran

An MSC.Dytran analysis can be submitted by double-clicking the MSC.Dytran icon, , which is visible on your desktop. If the icon is not installed on your desktop, you can find it in the **Programs** folder under **MSC.Dytran**, or in a user-defined folder. After double-clicking on the MSC.Dytran icon, the graphical MSC.Dytran user environment appears:



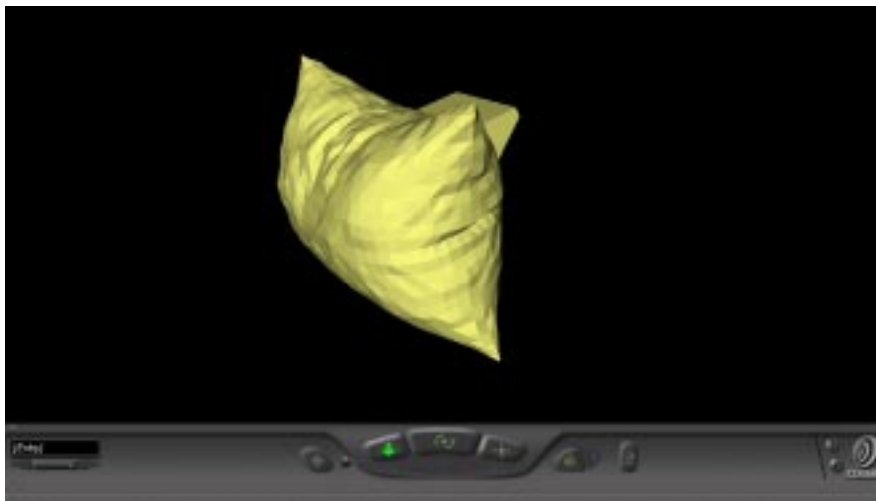
Following is a brief description of the main features of the graphical user interface.

- Start an MSC.Dytran analysis by clicking on the **Start Job** button, , after selection of the input file(s) and executable size. The graphical user interface is a Multiple Document Interface (MDI) application. You can submit multiple jobs from the user interface by selecting **File →New** from the top menu.
- Kill an MSC.Dytran job by using the **Exit Job** button, . This button appears in the window after submitting an MSC.Dytran analysis.

You can also kill a job by exiting the graphical user environment with **File →Exit**. Upon exiting the graphical user environment, a running analysis can be killed or can continue to run in the background. The progress of a background job can be monitored by selecting **File →Open** in the graphical user environment, selecting the appropriate job file name and double clicking on the printed output file.

Note that a job that is running in the background can only be killed using the Windows NT 4.0 task manager.

- File Preview
  - You can view and edit input files (extension .dat) by double-clicking on the filename. By default, the file will open in WordPad. You can select another viewer by selecting **Options →Preferences →Formats**.
  - During and after the analysis, you can view the printed output file (extension .OUT) by double-clicking on the output filename. During execution, monitor the progress of the analysis by looking at the cycle summary in the printed output file.
  - You can visualize the contents of an archive file (extension .ARC) for a quick preview by double-clicking on the archive filename. As a result, a VRML file is created for each archived time step. Only the geometry of shell quad and tria meshes are currently supported.





View these VRML files with your browser or any other VRML viewer by double-clicking on the VRML filename (extension .wrl). In order to view the archive content, your browser must be able to visualize VRML files.

In case your browser does not have a VRML plug-in, you can download a VRML viewer plug-in from the Web; the COSMO player, for example. Download the COSMO player from the web by selecting **Help** → **VRML Files** and clicking the **COSMO** icon.

- Restarts are automatically detected in the input file.

---

## 4.2 Postprocessing MSC.Dytran Results

MSC.Dytran results can be postprocessed with MSC.Patran or other third party postprocessing products, on either Windows NT 4.0 or on UNIX computers.

### 4.2.1 Postprocessing MSC.Dytran Results on Windows NT 4.0 with MSC.Patran

Pre- and postprocessing on Windows NT 4.0 is supported in MSC.Patran starting with MSC.Patran V8.5. See the “MSC.Patran-Dytran Preference Guide” for more details.

### 4.2.2 Postprocessing MSC.Dytran Results on UNIX

If you wish to postprocess Windows NT 4.0 analysis results on a UNIX computer, you need to write the results files out in a UNIX format. For Digital Alpha UNIX workstations, the native Windows NT 4.0 results files can be used directly without conversion. For all other UNIX workstations you must write the Windows NT 4.0 analysis results files in a UNIX format, by selecting **Preferences** from the **Options** menu. Choose **Formats** and select **Convert output files automatically to Unix-format**.

Aside from the regular Windows NT 4.0 results files, UNIX native result files will also be generated at the end of the analysis. These UNIX native results files can be recognized by the prefix “UX\_” in their name. Transfer the “UX\_” prefixed files to your UNIX computer and postprocess as usual.

---

## 4.3 Advanced Techniques

### 4.3.1 Estimating Resources

MSC.Dytran executes almost entirely in core. During the input phase, the input file is read and the data is stored in arrays within the program.

MSC.Dytran is delivered with three different executable sizes: small, medium, and large. The executable for small-size problems uses 40 MB of memory, medium-size problems use 90 MB of memory, and large-size problems use 160 MB of memory. The size of the executable must be chosen in the graphical user environment before starting an MSC.Dytran analysis.

If you can not run your problem using the maximum supplied executable size, you can increase the size of the memory of the executable by using a user-defined subroutine. Section 4.3.2, [Memory Management Using a User-Defined Subroutine](#). For the creation of such a customized MSC.Dytran version, a Digital Visual Fortran 6.0 compiler is required. MSC.Dytran Version 4.7 was built using the Digital Visual Fortran 6.0 compiler.

**Warning:** If you increase the amount of memory too much, and your system does not have enough swap space, you will not be able to run MSC.Dytran. You must either decrease the size of the parameters in the user-defined subroutine, or increase the physical memory or swap space on your system.

### 4.3.2 Memory Management Using a User-Defined Subroutine

If you need to increase the amount of memory beyond the large size, you can customize MSC.Dytran with the help of a subroutine called `memory_large.f`. The memory allocation routine, `memory_large.f`, resides in the `<installation_directory>/dytran47/dytranexe` folder, and must be copied to the folder in which you are creating the customized MSC.Dytran version.

Inside the FORTRAN subroutine `memory_large.f` are four parameter statements defining the size of the arrays used by the program. The current definitions are:

```
LIMI = 12 000 000  Storage space for integers.
LIMX = 11 000 000  Storage space for real variables.
LIMC = 1 500 000   Storage space for character variables.
LIML = 750 000    Storage space for logical variables.
```

To create an executable with a larger memory definition, you must increase the values of the four parameters in the `memory_large.f` subroutine, and perform the following steps in a DOS command line window. The steps below are valid for the Digital Visual Fortran 6.0 compiler. If you have an other compiler, please refer to your compiler documentation for the correct compile and link commands.

1. Copy the file `memory_large.f` to the folder in which you want to create a new customized MSC.Dytran version and change the memory sizes in the file.
2. Compile `memory_large.f` with your FORTRAN compiler, using the command:

```
f90 /nologo /compile_only /iface:nomixed_str_len_arg /iface:cref
/optimize:2 memory_large.f
```

3. Link the `memory_large.obj` routine with the MSC/DYTRAN library, `dytran.a`, to create a modified executable, using the command:

```
f90 /link <installation_dir>\dytran47\dytranexe\dytran.obj
memory_large.obj
<installation_dir>\dytran47\dytranexe\dytran_1.a
<installation_dir>\dytran47\dytranexe\dytran_2.a
<installation_dir>\dytran47\dytranexe\dytran_3.a
<installation_dir>\dytran47\dytranexe\dytran_4.a
<installation_dir>\dytran47\dytranexe\dytran_5.a
<installation_dir>\dytran47\dytranexe\dytran_6.a
<installation_dir>\dytran47\dytranexe\liblapi.wintel.lib
<installation_dir>\dytran47\dytranexe\lmgr326b.lib
```

You can use the new customized version of MSC.Dytran by selecting **Other** instead of **Small**, **Medium**, or **Large** under **Executable** in the MSC.Dytran graphical user environment when you start an MSC.Dytran analysis.

### 4.3.3 Customizing MSC.Dytran with User-Written Subroutines

User-written subroutines for customizing MSC.Dytran are not automatically supported in the graphical user environment on Windows NT. On Microsoft Windows NT 4.0, user-written subroutines can only be linked manually with the MSC.Dytran library, when a Digital Visual Fortran 6.0 compiler is present on your Windows NT machine. MSC.Dytran Version 4.7 uses the Digital Visual Fortran 6.0 compiler.

MSC.Dytran allows you to add your own subroutines to the program. The FORTRAN coding for the subroutines should be stored in one file that is in the same folder as the customized version of MSC.Dytran. To create a customized MSC.Dytran version you need to perform the following steps in a DOS command line window. The steps below are valid for the Digital Visual Fortran 6.0 compiler. If you have another compiler, please refer to your compiler documentation for the correct compile and link commands.

1. If your user subroutine is called `usersubroutine.f`, compile `usersubroutine.f` with your FORTRAN compiler using the command:

```
f90 /nologo /compile_only /iface:nomixed_str_len_arg /iface:cref
/optimize:2 usersubroutine.f
```

2. Link the usersubroutine.obj routine with the MSC/DYTRAN library, dytran.a, and an appropriate memory.obj routine to create a modified executable, using the command:

```
f90 /link <installation_dir>\dytran47\dytranexe\dytran.obj
        <installation_dir>\dytran47\dytranexe\memory.obj
        usersubroutine.obj
        <installation_dir>\dytran47\dytranexe\dytran_1.a
        <installation_dir>\dytran47\dytranexe\dytran_2.a
        <installation_dir>\dytran47\dytranexe\dytran_3.a
        <installation_dir>\dytran47\dytranexe\dytran_4.a
        <installation_dir>\dytran47\dytranexe\dytran_5.a
        <installation_dir>\dytran47\dytranexe\dytran_6.a
        <installation_dir>\dytran47\dytranexe\liblapi.wintel.lib
        <installation_dir>\dytran47\dytranexe\lmgr326b.lib
```

Depending on the size of your problem, you can link your own user-written memory routine to MSC.Dytran, or use the precompiled memory\_medium.obj or memory\_large.obj from the <installation\_dir>/dytran47/dytranexe folder.

You can use the new customized version of MSC.Dytran by selecting **Other** instead of **Small**, **Medium** or **Large** under **Executable** in the MSC.Dytran graphical user environment when you start an MSC.Dytran analysis.

# FLEXlm Problems and Resolutions

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## 5.1 FLEXlm and Licensing Problems

This section covers possible problems installing or starting the FLEXlm license servers, and problems MSC.Dytran can have communicating with or obtaining licenses from those servers.

Most licensing problems manifest themselves with a security error in MSC.Dytran. MSC.Dytran provides a log with license information at the bottom of the printed output file. A typical license information log is given below. This log is printed in case no license problems are encountered by MSC.Dytran.

```
Acquired 1 license for MSC.Dytran Basic
Returned 1 license for MSC.Dytran Basic
```

In case you experience licensing problems with FLEXlm, you can obtain more licensing information in the printed output file by inserting the PARAM,AUTHINFO,9 option in the input file.

---

## 5.2 Windows NT Environment Variables

MSC.Dytran for Windows NT 4.0 uses two environment variables, called MSC\_LICENSE\_FILE and LM\_LICENSE\_FILE for FLEXlm licensing. These environment variables are automatically set during the installation by the Setup Wizard. A number of possible installation problems are described in the following sections, in which the MSC\_LICENSE\_FILE and LM\_LICENSE\_FILE play a role. In case you need to check these environment variables, use **Control Panel** → **System** → **Environment**.

---

## 5.3 General FLEXlm Troubleshooting

Check the licensing log at the end of the printed output file to determine the cause of the licensing problem. Verify that the correct license server and/or license file have been used. Check the paths and server names in the `license.dat` file. See Section 3.5.4.2, [Check Paths and Server Names in the license.dat File](#).

One of the following conditions must be met for MSC.Dytran to locate a license:

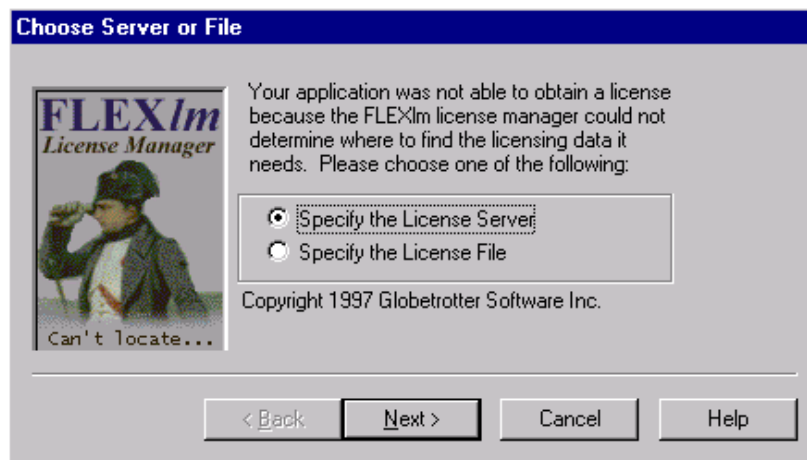
- If the Windows NT 4.0 machine you are running on is the FLEXlm license server, it must have a `license.dat` file that includes valid network FEATURE codes and correct SERVER and DAEMON lines. The `license.dat` file is located in the folder `<install_folder>\flexlm\licenses`.

The server must also be running the `lmgrd` and `msc` daemons. These services are started up automatically after reboot when the `LM_LICENSE_FILE` has been set by the FLEXlm installation. You can check if the license server started up by using **Control Panel** → **Services**. The **FLEXlm License Server** must have the status **Started**.

- A `license.dat` file that includes a SERVER line that references a valid FLEXlm server running the `lmgrd` and `msc` daemons.
- An `MSC_LICENSE_FILE` environment variable that references the hostname and port number of a valid FLEXlm server running the `lmgrd` and `msc` daemons. See Section 5.2, [Windows NT Environment Variables](#) for information on this environment variable.
- A correct `license.dat` file containing valid nodelock codes must be used by the `MSC_LICENSE_FILE` environment variable (see Section 5.2, [Windows NT Environment Variables](#)) or in the directory `c:\msc\flexlm\licenses`.

## 5.4 FLEXlm Problems and Resolutions

Problem 1: When running MSC.Dytran the following window appears



Resolution 1: This window appears in the following cases:

- FLEXlm licensing has not been installed. To solve the problem you must install FLEXlm licensing using the installation Setup Wizard.
- During a “Client Install” you have entered a wrong port number or license server name. Check that the MSC\_LICENSE\_FILE environment variable defines the correct port number and server (see Section 5.2, [Windows NT Environment Variables](#)), and if needed, install FLEXlm again, using the installation Setup Wizard.
- The license.dat file installed by FLEXlm was removed or renamed after the installation. Check if the license file, used by the environment variables LM\_LICENSE\_FILE and/or the MSC\_LICENSE\_FILE, does exist. Replace the file if needed.
- The license file does not contain any recognizable license keys. Install FLEXlm again, using a valid license file obtained from MSC. You can recognize MSC.Dytran licensing keys by their feature names: FEATURE DYTRAN\_Standard and FEATURE DYTRAN\_Basic.
- You can continue the current MSC.Dytran analysis when the window above appears, without first solving the existing FLEXlm problem, by entering the name of a valid license server or the location and name of a valid license file. FLEXlm will ask you to enter this license information twice.

Note: FLEXlm asks if you want to use the entered license information permanently, but in this release of MSC.Dytran you can not do this. The entered license information is used during the current analysis only.

**Problem 2: Cannot connect to a license server**

You get the following license log message at the bottom of your printed output file:

```
A request to check out 1 licenses for MSC.Dytran Basic was denied.  
Cannot connect to license server.  
The server (lmgrd) has not been started yet, or the wrong port@host or  
license file is being used, or the port or hostname in the license file  
has been changed.
```

**Resolution 2:** You are unable to contact a license server successfully. Check for the following possible causes:

- MSC.Dytran is not referencing the correct server and port. The server name or hostid in the `license.dat` file are not correct, or the port selected in the `license.dat` file and the port given to MSC.Dytran are not the same, or the port is being used by something else.

You can test TCP/IP access to a host and port with the following telnet command in the DOS command window or at the command line under **Start →Run:**

```
%telnet <hostname> <portnumber>
```

Note that this does not allow you to login (telnet is not actually listening at that port), but it should connect.

- The server machine or network is down.
- The vendor daemon is not running. Both the `lmgrd` and `mcs` daemons must be running on the server. See Section 5.3, [General FLEXlm Troubleshooting](#).
- The client does not recognize the hostname on the `SERVER` line or set with `MSC_LICENSE_FILE`. Make sure that the local machine can ping to “host”. Also, try the telnet test above.
- You are running the license file on the server in an old version of FLEXlm. MSC.Dytran requires at least FLEXlm v5.12 (the version shipped with MSC.Dytran).
- TCP/IP is not running properly on the client or host. See the telnet test above.

**Problem 3: You can connect to a license server, but no license is checked out**

You get the following license log message at the bottom of your printed output file:

```
A request to check out 1 licenses for MSC.Dytran Standard was  
denied. Invalid (inconsistent) license key.  
The license-key and data for the feature do no match.  
This usually happens when a license file has been altered.
```



Resolution 3: You appear to have contacted the server successfully, but no valid MSC.Dytran license key could be found. Check for the following possible causes:

- The license file does not contain any MSC.Dytran license keys. You can recognize MSC.Dytran license keys by their feature names: FEATURE DYTRAN\_Standard and FEATURE DYTRAN\_Basic.
- The license file contains MSC.Dytran license keys, but these are not correct license keys. This can happen when you have added the license keys to an existing license file or the license file got corrupted, e.g., during e-mail or copying.

Problem 4: **You can connect to a license server, but no license is checked-out**

You get the following license log message at the bottom of your printed output file:

```
DYTRAN Standard      MSC.Dytran Standard      3501
Unable to locate a license entry for MSC.Dytran Basic (3500)
The license server may be unavailable.
Entering queue for up to 1 minutes to obtain 1 licenses for
MSC.Dytran Standard (-35)
Users for feature MSC.Dytran Standard - 1 total licenses
```

| Name     | Node | Display | Nlic | Status |
|----------|------|---------|------|--------|
| Install  | eyck | eyck    | 1    | In Use |
| superhe> | bol  | bol     | 1    | Queued |

Unable to release - PID 3501 is invalid, was never checkedout, or has already been released.

Resolution 4: You are running an analysis that requires an MSC.Dytran Basic license and you only have a single-user MSC.Dytran Standard license available. This license would allow the execution of the analysis. You appear to have located the MSC.Dytran Standard license successfully, but the license is currently in use by an other analysis. You have to wait until the running MSC.Dytran analysis has finished and the license is released again.

Your license request will be queued for one minute. If the license has not been released during that time, your MSC.Dytran analysis will terminate.

**Problem 5: You can connect to a license server, but no MSC.Dytran Standard license is checked-out**

You get the following MSC.Dytran error message in your printed output file:

```
%E-GP140302-P3XXTXIX_CYCLE_ZERO,,,  
You are not authorized to use MSC-DYTRAN Standard
```

and the following license log message at the bottom of your printed output file:

```
Unable to locate a license entry for MSC.Dytran Standard (3501)  
The license server may be unavailable.
```

**Resolution 5:** You only have an MSC.Dytran Basic license for structural analysis, while your analysis includes Eulerian elements and therefore needs an MSC.Dytran Standard license. If you want to run your Eulerian analysis you need to acquire an MSC.Dytran Standard license from MSC.