

# Marc® and Mentat® 2008 r1

## Installation and Operations Guide

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# Marc and Mentat for Unix Installation and Operations Guide

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Table 1 Versions of Marc Running under Unix

| Computer                           | Operating System Revision      | CDROM mount command (assumes /cdrom exists)                                                                                                                                                                                                 | CDROM umount command                                                   |
|------------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>HP RISC PA2.0, HP Itanium 2</b> | HP-UX 11.00, HP 11.23 or later | mount /dev/dsk/c0tnd0 /cdrom ( <i>if patched</i> )<br>mount -o cdcase -F cdfs/dev/dsk/c0tnd0 /cdrom ( <i>if not patched</i> )<br><br>where:<br><b>n</b> = SCSI controller number for CDROM                                                  | cd <other_dir><br>umount /cdrom                                        |
| <b>IBM RS6000</b>                  | AIX 5.2 or later               | mount -rv cdrfs /dev/cd0 /cdrom                                                                                                                                                                                                             | cd <other_dir><br>umount /cdrom                                        |
| <b>Silicon Graphics</b>            | IRIX64 6.5 or later            | CD will be automounted by system<br>or<br>mount -rt iso9660 /dev/scsi/scndul0 /cdrom<br>where:<br><b>n</b> = SCSI controller number<br><b>u</b> = CD-ROM unit #<br><br><b>Note:</b><br>The CDROM will usually automount to /cdrom or /CDROM | cd <other_dir><br>eject CDROM<br>or<br>cd <other_dir><br>umount /cdrom |
| <b>Sun</b>                         | Solaris 9 or later             | CD will be automounted by system                                                                                                                                                                                                            | cd <other_dir><br>eject cdrom                                          |
| <b>Intel/AMD</b>                   | Linux 2.4.20 or later          | mount /mnt/cdrom                      RedHat                                                                                                                                                                                                | cd <other_dir><br>umount /mnt/<br>cdrom                                |



## Chapter 1: Read me first: Installation Prerequisites

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Before installing the software</b>   | <p>Decide where you want the product to be installed before loading in the Marc and/or Mentat software from the CD-ROM. You will be prompted for a parent directory to install the software, which will be referred to as &lt;parent&gt;. During the installation, a directory called marc2008z, and/or mentat2008r1, install, and flexlm will be created in the directory you specify.</p> <p>Marc requires approximately 500 Mbytes of permanent disk storage capacity. Mentat requires approximately 800 Mbytes of permanent disk storage capacity. The mentat2008r1/examples directory contains approximately 250 Mbytes of data.</p> <p>If you are installing both Marc and Mentat, install Marc first, and then install Mentat.</p>                                                                                                                                                                                                                                |
| <b>Personal data</b>                    | <p>During installation, you will be prompted to supply your name, address, telephone number, etc. You will also be asked to enter the MSC license agreement number which is listed on the accompanying packing slip.</p> <p>This information will be sent to the MSC.Software Corporation office supplying you the installation passwords and is intended to keep your data as known to the MSC.Software Corporation up to date.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Password protection</b>              | <p>The Marc and Mentat version you have received is protected against illegal usage by means of Macrovision's FLEXlm licensing software. You <i>cannot</i> run the program directly after you have installed the product from the CD-ROM until you obtain passwords from MSC.Software Corporation. Passwords will be supplied to you from the nearest MSC.Software Corporation office after you have performed the first two steps of the installation procedure. These steps are as follows:</p> <ol style="list-style-type: none"> <li>1. Run the installation script, install the software from the CD-ROM, and generate a machine specific identifier for the purpose of creating passwords.</li> <li>2. Send the machine specific identifier to the nearest MSC.Software Corporation office.</li> <li>3. Upon return of the passwords, enter these by editing the <code>license.dat</code> file.</li> </ol> <p>Passwords normally only need to be entered once.</p> |
| <b>Multiple machines/NFS Fileserver</b> | <p>If you are installing Marc and/or Mentat on an NFS Fileserver, the install script needs to create directories in which to install Marc and/or Mentat; the default NFS export options do not allow this level of access by root. Two approaches are possible – do not install as root, or if <i>you must install as root, modify your NFS export options to include ~root=list</i> (where <i>list</i> can include hostnames and netgroups).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Should I be “root”?</b> | <p>Normally, there is no need to be logged in as <code>root</code>. However, you will be queried as to whether you want to create an optional link by which Marc and/or Mentat will be known system-wide under the name <code>marc2008</code> or <code>mentat2008</code>. This link will, by default, be placed in the directory <code>/usr/local/bin</code> to which you must have write permission. Logging in as <code>root</code> is one way of ensuring that you can create this link. Make sure that you have write permission to the installation directory before you start the installation script. Note that on most systems you will have to be <code>root</code> to mount the CD-ROM.</p> <p>For NFS fileserver networks, read the previous paragraph.</p> |
| <b>FORTTRAN compiler</b>   | <p>A FORTRAN compiler is necessary if user subroutines are to be used. For other cases, no compiler is needed. The compiler needs to be compatible with the one used in the Marc build, see the <i>Marc and Mentat Release Guide</i> for a list of supported compilers.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## Chapter 2: Quick Installation Procedure

|                                                      |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1:<br/>Start the install script</b>          | <cdrom_dir>./install.exe                                                                                                                                                                                                                                                                                                                                          | Run the Marc installation script <code>install.exe</code> from the CD-ROM. Substitute your CD-ROM device name for <cdrom_dir>. For example, on a Sun this may be <code>/cdrom/cdrom0</code> .                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                      | <b>Welcome to the Marc installation script for Unix systems</b><br>Enter a valid pathname to the directory to install the software<br>(<current directory>)                                                                                                                                                                                                       | Enter the path for the directory in which you want to install the Marc product(s). The default selection will be your current directory. You must have write permission to this directory.                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Step 2:<br/>Extract the files from the CD-ROM</b> | <b>Main Menu</b><br>1 ) Install/Test Marc<br>2 ) Install Mentat<br>d) Install Documentations<br>o) Options<br>? ) Help information<br>q ) Exit from the installation script<br>Selection: <b>1</b>                                                                                                                                                                | Select option <b>1</b> to install Marc. This will take you to the Marc submenu.<br>Select option 2 to install Mentat.<br>Option <b>d</b> will only appear in the documentation CD.<br><b>Note:</b><br>Remember to install Marc before you install Mentat.<br>Documentation should be installed <b>after</b> Marc and Mentat are installed.                                                                                                                                                                                                                                                                                              |
| <b>Select the platform</b>                           | <b>Marc 2008 r1 Menu</b><br>H1) Install for HP-UX 11.00 PA2.0<br>LP64 (~500 MB)<br>H2) Install for HP-UX 11.00 PA2.0<br>ILP64 (~500 MB)<br>H3) Install for HP-UX 11.23 Itanium 2<br>LP64 (~500 MB)<br>H4) Install for HP-UX 11.23 Itanium 2<br>ILP64 (~500 MB)<br>I1) Install for IBM AIX 5.2<br>LP64 (~500 MB)<br>I2) Install for IBM AIX 5.2<br>ILP64 (~500 MB) | Select the platform that you will be running Marc on. The script will determine a default value, and it will be shown in brackets after the Selection prompt. Just press Return/Enter to use the default value. The default for each platform is the LP64 version. You can select the ILP64 version to install by typing in the proper number, e.g. H2. You will also be prompted whether you want to create a system wide link to the <code>marc2008r1</code> script<br><b>Note:</b><br>Other platforms may appear on your menu list that are not shown here. Do not attempt to install the 64bit version on a 32bit operating system. |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | L1) Install for LINUX 2.6 IA32<br>RedHat AS 4 (~450 MB)<br>L2) Install for LINUX 2.6 RHEL 4<br>LP64 (~450 MB)<br>L3) Install for LINUX 2.4 IA64<br>RHEL 3 - LP64 (~450 MB)<br>L4) Install for LINUX 2.4 IA64<br>RHEL 3 - ILP64 (~450 MB)<br>L5) Install for LINUX 2.6 EM64T/AMD<br>RHEL 3 - LP64 (~450 MB)<br>L6) Install for LINUX 2.6 EM64T/AMD<br>RHEL 3 - ILP64 (~450 MB)<br>G1) Install for SGI IRIX64 R12K 6.5<br>LP64 (~500 MB)<br>G2) Install for SGI IRIX64 R12K 6.5<br>ILP64 (~500 MB)<br>G3) Install for SGI Altix Itanium Propack 3<br>LP64 (~500 MB)<br>G4) Install for SGI Altix Itanium Propack 3<br>ILP64 (~500 MB)<br>S1) Install for Sun Solaris 10 Ultra III<br>LP64 (~500 MB)<br>S2) Install for Sun Solaris 10 Ultra III<br>ILP64 (~500 MB)<br>t ) Test and maintain the installation<br>? ) Help information<br>r ) Return to previous menu |                                                                                                                                                                                                                |
|  | r) Return to the previous menu<br>OR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Choose the Return to previous menu option to return to the main menu.                                                                                                                                          |
|  | <b>Mentat 2008 r1 Installation</b><br><b>Mentat Menu</b><br>h1) Install for HP-UX 11.00<br>PA2.0 (~850 MB)<br>h3) Install for HP-UX 11.22<br>Itanium 2 (~850 MB)<br>i1) Install for IBM AIX<br>5.2 (~800 MB)<br>11) Install for LINUX 2.4 IA32<br>RHEL 3 (~750 MB)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Select the platform that you will be running Mentat on. The script will determine a default value, and it is shown in brackets after the <i>Selection</i> prompt. Press Return/Enter to use the default value. |

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | 12) Install for LINUX 2.4 EM64T/AMD<br>RHEL 3 (~750 MB)<br>13) Install for LINUX 2.4 IA64<br>RHEL 3 (~750 MB)<br>15) Install for LINUX 2.4 EM64T/AMD<br>RHEL 3 (~750 MB)<br>g1) Install for SGI IRIX64 R12K<br>6.5 (~750 MB)<br>g3) Install for SGI Altix<br>Itanium Propack 3 (~750 MB)<br>s1) Install for Sun Solaris 9<br>Ultra III (~750 MB)<br>? ) Help information<br>r ) Return to previous menu | <p>You will be prompted to supply the pathname to the directory where Marc is installed. If the script determines that Marc is already installed to the default location of &lt;parent&gt;/marc2008r1, then a default value for the path is displayed. Press Return/Enter to use the default value. If you do not have Marc at this site, you can ignore the prompt.</p> <p>You will also be prompted whether you want to create a system wide link in /usr/local/bin to the <i>mentat</i> script. You must be root to perform this.</p> <p><b>Note:</b><br/>Other platforms may appear on your menu list that are not shown here.</p> |
|                                           | r) Return to the previous menu                                                                                                                                                                                                                                                                                                                                                                          | Choose the Return to previous menu option to return to the main menu.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Step 3: Options</b>                    | o) Go to options menu in main menu                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Step 4: Security</b>                   | s ) Install Security<br>sd) Install Security documentation<br>u ) Update Product scripts<br>d ) Delete (un-install) a product<br>ci) Change the installation directory<br>cd) Change the CDROM path<br>l ) Change the product listing file<br>sc) Determining system configuration                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Step 5: Generate system identifier</b> | s) Security submenu<br>1) Generate system identifier file                                                                                                                                                                                                                                                                                                                                               | Generate system identifier. From the options menu, select option s, and then option 1. You will be prompted for your name, address, etc. You will also be prompted to supply your MSC license agreement number and your amendment number which is in the accompanying letter.                                                                                                                                                                                                                                                                                                                                                          |

|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 6:<br/>Send the<br/>system<br/>identifier to<br/>MSC.Software</b> | <ul style="list-style-type: none"> <li>2) Show system identifier</li> <li>3) Print the system identifier</li> <li>4) Send the system identifier</li> <li>r) Return to previous menu</li> <li>q) Exit from the installation script</li> </ul>                                                                                                                                       | <p>The system identifier is stored in the subdirectory <code>install</code> under the <code>&lt;parent&gt;</code> directory, in a file called <code>sid001.dat</code>. Send the contents of this file to the nearest MSC.Software Corporation office to receive passwords. You may exit the script now by choosing the option <b>q</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Step 7:<br/>Enter the<br/>password</b>                                 | <pre>cd &lt;parent&gt;/flexlm mkdir licenses cd licenses vi license.dat chmod 644 license.dat</pre>                                                                                                                                                                                                                                                                                | <p>When you receive the passwords from the MSC.Software salesperson, they should be entered by means of creating the file <code>license.dat</code> file in the <code>flexlm/licenses</code> subdirectory using an editor. If the file was E-mailed to you, then save the contents in <code>license.dat</code>. See Macrovision's <i>FLEXlm End User Manual</i> for more information on the license file format.</p>                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                           | <b>For Marc Network run see Step 9.</b>                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Step 8:<br/>Checking<br/>Marc</b>                                      | <ul style="list-style-type: none"> <li>1) Install/Test the Marc program</li> <li>t) Test and maintain the installation</li> </ul> <p><b>Marc Tools Menu</b></p> <ul style="list-style-type: none"> <li>1) Test Marc installation</li> </ul> <p><b>Test the Marc installation</b></p> <ul style="list-style-type: none"> <li>1.1) Run a Marc job without user subroutine</li> </ul> | <p><b>If you installed both Marc and Mentat</b>, you can check the Marc installation by following the instructions under (<a href="#">Checking Marc from Mentat</a>).</p> <p>Start the <code>install.exe</code> script again, and select option <b>1</b>, "Install the Marc program", and then select <b>t</b> ) "Test and maintain the installation". This brings up a new menu. Select option <b>1</b>, "Test Marc installation". A new "Test" menu appears. You must choose either <b>Serial</b> or <b>Parallel</b> depending on the license you have.</p> <p>Run one of the standard Marc demonstration examples as proof of a successful installation by choosing option <b>1.1</b>. If all goes well, one of the final messages on screen should read:</p> <p style="text-align: center;"><b>Marc Exit number 3004</b></p> |

|  |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 1.2) Trial Marc job with user subroutine                           | <b>If you have a FORTRAN compiler on your system</b> , choose a second demonstration example, option <b>1.2</b> . Here again, Marc should give a <b>Marc Exit number 3004</b> .                                                                                                                                                                                                                                                                                                                                  |
|  |                                                                    | <b>Troubleshooting:</b> <ol style="list-style-type: none"> <li>1. If you get an error message of <code>f77 not found</code> when running a job with a user subroutine and there is a Fortran compiler, its path needs to be appended to your path in the <code>.cshrc</code> file. A typical example would be the Sun platform where the <code>f77</code> compiler may reside in the <code>/opt/SUNWspro/bin</code> directory. This path must be added if you get the <code>f77</code> error message.</li> </ol> |
|  |                                                                    | <ol style="list-style-type: none"> <li>2. For the IBM-SP machines, if you get<br/> ERROR: Hostfile or pool must be used to request nodes,<br/> create a hostfile in the <code>marc2008r1/tools</code> directory with the available nodes in it as: <pre>node 1 node 2 : etc.</pre> and set the path to point to this file in <code>MP_HOSTFILE</code> variable in the include file in the <code>tools</code> directory.</li> </ol>                                                                               |
|  | r) Return to previous menu<br>q) Exit from the installation script | Repeatedly choose the Return/Exit option to leave the installation script.<br>Choose option <b>q</b> to leave the installation script.                                                                                                                                                                                                                                                                                                                                                                           |

|                                                                                                              |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step: 9</b><br><b>Checking</b><br><b>Mentat</b><br><b>(Checking</b><br><b>Marc from</b><br><b>Mentat)</b> | <pre>cd &lt;parent&gt;/mentat2008r1 ./bin/mentat</pre> <p>Run a Demo problem by selecting the menu buttons:</p> <p>HELP</p> <p>RUN A DEMO PROBLEM</p> <p>COUPLED CONTACT</p> | <p>Next, change your current directory to be the &lt;parent&gt; directory in which you installed MSC.Mentat, and then <code>cd</code> to <i>mentat2008r1</i>.</p> <p>Enter the command <code>./bin/mentat</code> to start Mentat. From the HELP menu, select RUN A DEMO PROBLEM, and then select the COUPLED CONTACT demo. It will run for 50 increments.</p> |
| <b>Step 10:</b><br><b>For Marc</b><br><b>Parallel</b><br><b>Network</b><br><b>version only</b>               |                                                                                                                                                                              | <p>Please follow the <i>Marc 2008 Parallel Network Version for UNIX Installation Instructions</i> (<a href="#">Part 1 General Information</a>: and <a href="#">Part 2 Installation Notes</a>;) on installing and running jobs with the network version.</p>                                                                                                   |
| <b>Step 11:</b><br><b>Installing the</b><br><b>documentation</b>                                             |                                                                                                                                                                              | <p>Use option <b>d</b> on the documentation CD to install the documentations.</p>                                                                                                                                                                                                                                                                             |



## Chapter 3: Installation Procedure Information

|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Multiple machines/NFS Servers</b></p>                    | <p>If you are installing Marc and/or Mentat on an NFS Fileserver, the install script needs to create directories in which to install Marc and/or Mentat; the default NFS export options do not allow this level of access by root. Two approaches are possible – do not install as root, or if you must install as root, modify your NFS export options to include <code>~root=list</code> (where <i>list</i> can include hostnames and netgroups).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p><b>Step 1: Start the install script from the CD-ROM</b></p> | <p>Start the installation by running the <i>install.exe</i> script located on the CD-ROM from a “C” or Bourne shell. You should not have your current directory be the CD-ROM device, since temporary files will need to be created.</p> <p>If you are installing Marc and Mentat, install Marc first (using Main Menu option 1). Decide where the Marc and/or Mentat program is to be located in the system. This location is called the <code>&lt;parent&gt;</code> directory. For example, if you specify the installation path as <code>/usr/software/marc</code>, the <code>&lt;parent&gt;</code> directory is <code>/usr/software/marc</code>. It is recommended that you create this directory before you start the installation script. The directories <code>marc2008r1</code>, and/or <code>mentat2008r1</code>, <code>install</code>, and <code>flexlm</code> will be created when the program is installed.</p> <p>The <i>install.exe</i> script will accept the following options:</p> <ul style="list-style-type: none"> <li>-a            Turns on automatic installation – installs both Marc and Mentat from the CD-ROM. The <code>-i</code> option (described below) is required.</li> <li>-c <code>&lt;path&gt;</code>   Specifies the path to the CD-ROM device. This may also be the path to a NFS mounted CD-ROM. Normally the script will determine the path to the CD-ROM device from the path specified to invoke <i>install.exe</i> on the command line.</li> <li>-i <code>&lt;path&gt;</code>   Specifies the installation path (<code>&lt;parent&gt;</code> directory). This option is required when specifying the automatic installation option <code>-a</code>.</li> <li>-l <code>&lt;file&gt;</code>   Specifies a file for product listing</li> <li>-v            Turns on verbose mode.</li> </ul> <p>The “automatic” installation will install both Marc and Mentat. To perform an “automatic” installation, run the installation script as follows:</p> <pre>/cdrom/install.exe -a -i &lt;path&gt;</pre> <p>Note that when the “automatic” installation is complete, you will have to run the installation script interactively to generate the system identifier using option 1 (see <a href="#">Step 3: Generate system identifier</a>).</p> |

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                        | <p>Check the contents against the list supplied in <a href="#">Appendix C: Marc/Mentat Files and Subdirectories</a> of this document. If any subdirectory is missing, please contact MSC.Software Corporation customer support for further details.</p> <hr/> <p><b>Note:</b> See <a href="#">Table 1</a> at the beginning of this document for the name of the CD-ROM device for your machine if you can't determine what it is named, or see your systems administration guide.</p> <hr/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Step 2:<br/>Extract the files<br/>and set paths</b> | <p>Extract the files from the CD-ROM and set the path names in the Marc and/or Mentat background files to correspond to the location where you have installed the version. From the main menu list of the <code>install.exe</code> script, choose option <b>1</b> to install Marc or option <b>2</b> to install Mentat, and then select the platform from the Marc2008 r1 submenu. Note that a default platform selection is displayed if the script determines that Marc or Mentat has not yet been installed.</p> <p>In Marc, the installation script extracts the files and proceeds to set the path names in the <code>run_marc</code> scripts to correspond to the current location of the Marc version.</p> <p>In Mentat, the installation script extracts the files and proceeds to set the path names in the Mentat background files to correspond to the current location of the Mentat version.</p> <p>You will be asked a question concerning the Marc program which can be started from within Mentat. You are required to give the pathname to the directory where Marc is installed on your system. If you do not have Marc installed at your site, ignore the prompt.</p> <hr/> <p><b>Note:</b> Do not attempt to install a 64bit version of the product on a 32bit operating system.</p> <hr/> |
| <b>ranlib</b>                                          | <p>Some Marc Unix versions will ask if you want to <i>ranlib</i> the Marc binary libraries supplied with the version. This will create a fresh table of contents for the libraries. It is advisable to do this.</p> <hr/> <p><b>Note:</b> Not all Unix versions need the <i>ranlib</i>; the question will not appear on them.</p> <hr/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>link</b>                                            | <p>You will also be asked whether Marc and/or Mentat should be made accessible system wide under the link-name <code>marc2008r1</code> and/or <code>mentat2008r1</code>. If so, a symbolic link (<code>marc2008r1</code> and/or <code>mentat2008r1</code>) will, by default, be created in the directory <code>/usr/local/bin</code>.</p> <hr/> <p><b>Note:</b> If you decide to create the link, you</p> <ul style="list-style-type: none"> <li>• must be allowed to create the link at the chosen location (for example, be logged in as <code>root</code>).</li> <li>• must ensure your users who want to use Marc and/or Mentat have that location (<code>/usr/local/bin</code>) in their search path.</li> </ul> <hr/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 3: Generate system identifier</b>       | <p>Using the installation script <code>install.exe</code>, choose option <b>s</b>) <b>Install security</b> from the main menu list. A submenu will appear. Choose option <b>1</b> from this submenu to generate the system identifier.</p> <hr/> <p><b>Note:</b> When you generate the system identifier, you will be asked to enter your name, address, etc. See <a href="#">Appendix A: Sample Installation of Marc and Mentat</a> for a sample session.</p> <hr/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Step 4: Send to MSC.Software Corporation</b> | <p>The system identifier is stored in the subdirectory <code>install</code> under the &lt;parent&gt; directory, in a file called <code>sid001.dat</code>. The file can be printed using option <b>3</b> in <code>install.exe</code>. Send the printout by means of telefax to the nearest MSC.Software Corporation office. If you have access to the E-mail facility, you can E-mail the system identifiers directly using option <b>4</b> in <code>install.exe</code>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Step 5: Password</b>                         | <p>Change your current directory to the subdirectory <code>flexlm/licenses</code> under the &lt;parent&gt; directory. If you receive your passwords via E-mail, then save the license data in a file named <code>license.dat</code> in this directory. The permissions for <code>license.dat</code> should be 644, since all users will need read access. If you receive your passwords via telefax, then enter them by means of creating the <code>license.dat</code> file using an editor and typing in the information. The password will consist of at least three lines:</p> <p>“SERVER” line which specifies the system hostname</p> <p>“DAEMON” line which specifies the vendor specific daemon name and path</p> <p>“FEATURE” line(s) which specifies the product and options. This line contains the password and the expiration dates.</p> <p>The <code>run_marc</code> and <code>mentat</code> script uses the environment variable <code>MSC_LICENSE_FILE</code> to locate the <code>license.dat</code> file. It should be either the full pathname to the license file or using the specification <code>port@host</code>, such as <code>1500@moon.earth.com</code>.</p> <p>See <a href="#">Chapter 8: Managing FLEXlm with Marc and Mentat</a> or <i>Macrovision's FLEXlm End User Manual</i> for more information on entering your license password.</p> <hr/> <p><b>Note:</b> The FLEXlm license manager needs to be started on the license server before running the program. The <code>run_marc</code> and <code>mentat</code> scripts no longer attempt to start the license manager.</p> <hr/> |

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 6: Checking Marc</b>                | <p>If you installed both Marc and Mentat, you can check the Marc installation by following the instructions under “<a href="#">Checking Marc from Mentat</a>”.</p> <p>Run one of the standard Marc demonstration examples as proof of a successful installation. Using the installation script <code>install.exe</code>, choose <b>1</b>) Install Marc from the Main Menu, and then, choose <b>t</b>) Test and maintain the installation, and the Marc Tools menu appears. Choose option <b>1</b> from this menu, a new menu appears, and you must choose, depending on the license you have, either Serial or Parallel. A list of problems appears and you can choose which problem you want run. If all goes well, one of the final messages on screen should read <b>Marc Exit number 3004</b>. If you have a FORTRAN compiler on your system, choose a demonstration example with a user subroutine. Again, Marc should give a <b>Marc Exit number 3004</b>.</p> <hr/> <p><b>Note:</b> Should any of these examples not run, please use the checklist in <a href="#">Appendix B: Troubleshooting</a> to verify whether the installation was executed correctly. Refer to <a href="#">Chapter 4: Running Marc</a> of this document for the syntax of <code>run_marc</code>. Contact MSC.Software Corporation customer support if you are still unable to run the examples.</p> <hr/> |
| <b>Checking Mentat</b>                      | <p>Run Mentat. Repeatedly choose the exit option to leave the installation script:</p> <p><i>0)Return to the previous menu</i><br/> <i>0)Exit from the installation script</i><br/> <i>type mentat if a soft link was created</i></p> <hr/> <p><b>Note:</b> Should Mentat fail to start, please use the checklist in <a href="#">Appendix B: Troubleshooting</a> to verify whether the installation was executed correctly. Contact MSC.Software Corporation customer support if you are still unable to run the program.</p> <hr/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Checking Marc from Mentat</b>            | <p>If you have both Marc and Mentat installed, you can check the Marc installation from within Mentat. To do this, click the HELP button on the bottom-right corner of the Mentat window. Use the RUN A DEMO PROBLEM button to run an installation check on Marc.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Step 7: Exit</b>                         | <p>Choose the <i>exit</i> option to leave the installation script:</p> <p><i>r) Exit from the trial submenu</i><br/> <i>q) Exit from the installation script</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Step 8: Installing the documentation</b> | <p>Use option <b>d</b> of the documentation CD to install the documentations.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Chapter 4: Running Marc

This section describes the Marc usage on Unix based machines. The Marc programs are mainly controlled by a shell script called *run\_marc* which is stored in the `marc2008r1` subdirectory `tools`. If you have used the option to creating a link during the installation, this link is also known system wide as `marc2008r1`. It is designed to handle practically all possible options.

The shell script will submit a job and must be executed in the directory where all relevant input and output files concerning the job are available. To use the shell script, each Marc job should have a unique name qualifier and all Marc output files connected to that job will use this same qualifier.

Marc input files should always be named *job\_name.dat*, whereby the prefix *job\_name* is the name qualifier which you are free to choose. The suffix *.dat* is obligatory.

To actually submit a Marc job, the following command should be used. The single input line is split over multiple lines for clarity:

|                 |             |                                                               |
|-----------------|-------------|---------------------------------------------------------------|
| <b>run_marc</b> | <b>-jid</b> | <b>job_name (required as minimum)</b>                         |
|                 | -rid        | <i>restart_name</i>                                           |
|                 | -pid        | <i>post_name</i>                                              |
|                 | -sid        | <i>substructure_name</i>                                      |
|                 | -prog       | <i>program_name</i>                                           |
|                 | -user       | <i>user_subroutine_name</i>                                   |
|                 | -save       | <i>save_user_executable</i>                                   |
|                 | -back       | <i>run_in_background</i>                                      |
|                 | -ver        | <i>verification_flag</i>                                      |
|                 | -vf         | <i>viewfactor_name</i>                                        |
|                 | -def        | <i>defaults_name</i>                                          |
|                 | -nprocd     | <i>number_of_processors</i>                                   |
|                 | -nprocds    | <i>number_of_domains</i>                                      |
|                 | -nthread    | <i>number_of_threads</i>                                      |
|                 | -dir        | <i>directory where job I/O takes place</i>                    |
|                 | -sdir       | <i>directory where the scratch files are located</i>          |
|                 | -host       | <i>hostfile (for running over the network)</i>                |
|                 | -comp       | <i>compatible machines on a network</i>                       |
|                 | -ci         | <i>copy input files to remote machines in a network</i>       |
|                 | -cr         | <i>copy post files back from remote machines in a network</i> |
|                 | -ml         | <i>Memory limit in Mbytes.</i>                                |

Table 2 describes the meaning of these input options and Table 3 gives examples.

Table 2 run\_marc Input Options

| Keyword                                     | Options        | Description                                                                                                                                      |
|---------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>-jid (-j)</b>                            | job_name       | Job and input file name identification.                                                                                                          |
| <b>-prog (-pr)</b>                          | programe       | Run saved executable <i>programe.marc</i> from a previous job (usually <i>user_name</i> ; see below).                                            |
| <b>-user (-u)</b>                           | user_name      | User subroutine <i>user_name.f</i> will be used to generate a new executable program called <i>user_name.marc</i> .                              |
| <b>-save (-sa)</b>                          | <b>no</b>      | Do not save the new executable program <i>user_name.marc</i> .                                                                                   |
|                                             | yes            | Save the executable program <i>user_name.marc</i> for a next time.                                                                               |
| <b>-rid (-r)</b>                            | restart_name   | Identification of previous job that created RESTART file.                                                                                        |
| <b>-pid (-pi)</b>                           | post_name      | Identification of previous job that created postfile containing temperature data.                                                                |
| <b>-sid (-si)</b>                           | substructure   | Substructure jobs only: name of the substructuring file <i>substructure.t31</i> .                                                                |
| <b>-back (-b)</b>                           | yes            | Alternative for -queue: run the program in the background.                                                                                       |
|                                             | no             | Run the program in the foreground.                                                                                                               |
| <b>-ver (-v)</b>                            | yes            | Ask for confirmation before starting the job.                                                                                                    |
|                                             | no             | Will start the job immediately.                                                                                                                  |
| <b>-nprocd (-np)</b>                        | 2,3,4,etc      | Number of processors (generally same as the number of domains).                                                                                  |
| <b>-nprocds (-nps)</b>                      | 2,3,4,etc      | Number of domains for parallel processing using a Single Input file.                                                                             |
| <b>-nthread</b>                             | 2,4,etc        | Number of threads for parallel matrix solver.                                                                                                    |
| <b>-dir</b>                                 | directory_name | Directory where the job i/o should take place. Defaults to current directory.                                                                    |
| <b>-sdir</b>                                | directory_name | Directory where the scratch files are placed. Default is to -dir.                                                                                |
| <b>-host (-ho)</b>                          | hostfile       | Specify the name of the host file for running over a network (default is execution on one machine only in which case this option is not needed). |
| <b>-comp (-co)</b>                          | <b>yes</b>     | When machines are compatible in a run over the network.                                                                                          |
|                                             | no             | When machines are not compatible in a run over the network. This option is only needed when user subroutines are used.                           |
| <b>-ci</b>                                  | <b>yes</b>     | Automatically copy input files to remote machines in a network run.                                                                              |
|                                             | no             |                                                                                                                                                  |
| <b>-cr</b>                                  | <b>yes</b>     | Automatically copy post files back from remote machines in a network run.                                                                        |
|                                             | no             |                                                                                                                                                  |
| *Default options are shown in <b>bold</b> . |                |                                                                                                                                                  |

Table 2 run\_marc Input Options (continued)

| Keyword                                     | Options                         | Description                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>-vf</b>                                  | vf_filename                     | Refers to the viewfactor file for a heat transfer radiation analysis. (Monte Carlo method)                                                                                                                                                                                                                                                                                                                        |
| <b>-def</b>                                 | defaults_file                   | Used to define an auxiliary input file containing default values.                                                                                                                                                                                                                                                                                                                                                 |
| <b>-autorst</b>                             | <b>0</b> or <b>1</b>            | If <b>0</b> when remeshing is required, the analysis program goes into a wait state until meshing is complete.<br><br>If <b>1</b> when remeshing is required, the analysis program stops, the mesher begins, and the analysis program automatically restarts. Using the default procedure ( <b>0</b> ) uses more memory, but less I/O. Using the restart procedure ( <b>1</b> ), invokes the RESTART LAST option. |
| <b>-ml</b>                                  | available memorn on the machine | Provide an upper bound to the amount of memory available.                                                                                                                                                                                                                                                                                                                                                         |
| <b>-sdir</b>                                | directory_name                  | Directory where the scratch files are created during the run. Defaults to the current directory.                                                                                                                                                                                                                                                                                                                  |
| *Default options are shown in <b>bold</b> . |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                   |

Table 3 Examples of Running Marc Jobs

| Examples of running Marc jobs                          | Description:                                                                                                                                                                                                         |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>run_marc -jid e2x1</code>                        | Runs the job <i>e2x1</i> in the background, the input file <i>e2x1.dat</i> resides in the current working directory.                                                                                                 |
| <code>run_marc -jid e2x14 -user u2x14 -save yes</code> | Runs the job <i>e2x14</i> in the background, using the user subroutine <i>u2x14.f</i> and the input file <i>e2x14.dat</i> . An executable program named <i>u2x14.marc</i> will be saved after completion of the job. |
| <code>run_marc -jid e2x14a -prog u2x14</code>          | Runs the job <i>e2x14a</i> using the executable produced by job <i>e2x14</i> .                                                                                                                                       |
| <code>run_marc -jid e3x2a -ver no -back no</code>      | Runs the job <i>e3x2a</i> in the foreground. The job will run immediately without verifying interactively.                                                                                                           |
| <code>run_marc -jid e3x2b -rid e3x2a</code>            | Performs a restart job using the results of the previous job <i>e3x2a</i> .                                                                                                                                          |
| <code>run_marc -jid e2x1 -nprocd 2</code>              | Runs a two processor job on a single parallel machine.                                                                                                                                                               |

Table 3 Examples of Running Marc Jobs (continued)

|                                                              |                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>run_marc -jid e2x1 -nprocd 2 -host<br/>hostfile</code> | Runs a two-processor job over a network.<br>The hosts are specified in the file <code>hostfile</code><br>(refer to the <a href="#">Marc Parallel Network for Unix<br/>Installation and Operations Guide</a> for runs on a<br>network of machines. |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



## Chapter 5: Running Mentat

This section describes the Mentat usage on Unix based machines. Mentat is started by a shell script called *mentat* which is stored in the `mentat2008r1/bin` directory. If you used the option to create a link during the installation, this link is known system wide as *mentat2008r1*.

You do not need to start the shell script from a specific directory.

Mentat creates the default files in your current working directory; that is, where you are located at the time of starting Mentat.

The shell-script *mentat* contains a number of arguments which are passed on to Mentat. [Table 4](#) gives the meaning of these input options. You are free to alter these commands to suit your preference.

Table 4 Mentat Input Options

| Keyword         | Option                         | Description                                                                                                                                                                                                                                                                                                   |
|-----------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>-ar</b>      | area_ratio                     | This is similar to <code>-sz</code> , except it is a percentage of the default window size.                                                                                                                                                                                                                   |
| <b>-bp</b>      | <code>\$(DIR)/bin/</code>      | Directory path name where the external Mentat programs and shell scripts are located.                                                                                                                                                                                                                         |
| <b>-compile</b> | binary_menu_filename           | This is used to compile ASCII menu files into a Binary menu file.                                                                                                                                                                                                                                             |
| <b>-db</b>      | True/False                     | Double buffering: a screen refresh is first assembled in a separate memory section and then displayed. This option results in a smooth appearance. The default is <i>True</i> or <i>On</i> .                                                                                                                  |
| <b>-fn</b>      | 8x15                           | Default font type.                                                                                                                                                                                                                                                                                            |
| <b>-gr</b>      |                                | This uses the gray scale color map.                                                                                                                                                                                                                                                                           |
| <b>-ha</b>      | True/False                     | This option enables the middle mouse button help windows to run the Adobe Acrobat reader using the PDF help files. True turns on using the PDF help, false turns it off. The default is <i>True</i> or <i>On</i> .                                                                                            |
| <b>-help</b>    |                                | Print a list of all of the options.                                                                                                                                                                                                                                                                           |
| <b>-hp</b>      | <code>\$(DIR)/help/</code>     | Directory path name where the help files are located.                                                                                                                                                                                                                                                         |
| <b>-ic</b>      | bitplane_threshold<br>[3 - 8]  | This install color map switch is only relevant if you are running Mentat on an X Window screen that does not support many colors. This number allows you to set a lower bound on the number of colors Mentat will use. On cheaper screens, setting this number too high may produce distracting side effects. |
| <b>-lf</b>      | filename                       | Specify the Mentat logfile name.                                                                                                                                                                                                                                                                              |
| <b>-mb</b>      | 24/16/8                        | Maximum graphic depth allowed. The default is 24.                                                                                                                                                                                                                                                             |
| <b>-mf</b>      | main.ms                        | The name of the startup menu file.                                                                                                                                                                                                                                                                            |
| <b>-ml</b>      | <code>\$(DIR)/material/</code> | Directory path name where the material files are located.                                                                                                                                                                                                                                                     |
| <b>-mp</b>      | <code>\$(DIR)/menus/</code>    | Directory path name where the menu files are located.                                                                                                                                                                                                                                                         |

Table 4 Mentat Input Options (continued)

| Keyword      | Option           | Description                                                                                                                                                                          |
|--------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>-nh</b>   |                  | Not provided by default. For OpenGL and X Window versions of Mentat. The use of this switch reduces run time memory requirements at the expense of graphic speed.                    |
| <b>-ogl</b>  |                  | Use the OpenGL graphics interface, if available.                                                                                                                                     |
| <b>-path</b> | directory_name   | Provides a directory in which Mentat searches when opening an existing input file. Multiple directories can be specified as follows: <i>-path directory_1 -path directory_2</i> etc. |
| <b>-pr</b>   | filename         | Any additional set-up commands you wish to add. Store these in a procedure file containing the Mentat commands.                                                                      |
| <b>-ra</b>   |                  | This reads all of the ASCII Menu files.                                                                                                                                              |
| <b>-rf</b>   | filename         | Record the Mentat commands in the procedure file <i>filename</i> .                                                                                                                   |
| <b>-ss</b>   | True/False       | Graphic refresh to use snapshots. The default is <i>True</i> .                                                                                                                       |
| <b>-sz</b>   | width height     | Change the size (width and height in pixels) of the window.                                                                                                                          |
| <b>-ti</b>   | title            | Append <i>title</i> to the name of the window.                                                                                                                                       |
| <b>-xfdb</b> | True/False       | Fast X server double buffering. The default is <i>True</i> .                                                                                                                         |
| <b>-xr</b>   | horizontal_ratio | This is similar to <i>-sz</i> , except it is a percentage of the default window size in the horizontal direction.                                                                    |
| <b>-yr</b>   | vertical_ratio   | This is similar to <i>-sz</i> , except it is a percentage of the default window size in the vertical direction.                                                                      |

## Chapter 6: Making Changes to the Marc Programs

### Modifying the MPI Setting: mpich or hardware

For most platforms, the default MPI is either MPICH or HP MPI. For some platforms, Intel MPI or hardware MPI is also available as an option. You can use the `maintain` script in the `marc tools` directory to modify the MPI setting.

Refer to the *Marc and Mentat 2008 r1 Release Guide* for the exception.

If you choose to modify the MPI setting, you may do so by means of the *install.exe* script:

```
cd <parent>/install  
install.exe
```

Choose option **1** from the main menu to get to the Marc menu, and then choose **t** ) Test and maintain the installation to get to the Marc tools menu. Here, choose option **2** to get into the maintenance submenu. Choose the option **2.1** to modify the MPI setting.

The options of modifying the MPI setting are given.

## Chapter 7: Mentat Interfaces

### Mentat External Programs

Mentat supports a number of CAD interfaces: IGES, Patran, Ideas, VDA, etc. These interfaces are accessed using external programs called from within Mentat. The interface programs are stored in the *mentat2008r1* subdirectory *bin*. These programs read the data files in their native format and translate the contents into a Mentat model file. This file is subsequently read by Mentat. The external programs are called from within Mentat by means of the FILE submenu.

### Jobs

The subdirectory *bin* contains shell script files to start a Marc FEM job using the following shell scripts:

*submit1, submit2, submit3,*

These shell scripts are called by means of the buttons in the JOBS menu.

You can alter these files to suit your environment; for example, set up one of the *submit* scripts so that it starts a Marc job on a different machine on your network.

### Plotter Interface

Because of the many variations in plotting environments, we have created plotting interfaces in the form of shell scripts that operate from within Mentat. Currently, Mentat recognizes the following plotting formats:

- PostScript
- Xdump (translated in either PostScript or HPGL format)

This section describes a template shell script for each of the formats mentioned above. They are located in the *./bin* directory and are named as follows:

*psgray1, psgray2, psgray3*  
*pcolor1, pcolor2, pcolor3*  
*xdump1, xdump2, xdump3*

### PostScript

The PostScript function is activated by pressing either the Gray or Color Print button from the UTILS menu on the POSTSCRIPT panel. The program captures the graphics portion of the screen into a file and sends this file to a PostScript printer using the *psgray* or *pcolor* shell scripts located in the *./bin* directory. In the example listed below, the file is sent to a computer called 'mars' on the network. The *lpr* command with the *supt* argument sends the file to a PostScript printer known to the spooler as *supt*. After the file is sent, it is removed from disk automatically.

```
#!/bin/csh
rsh mars lpr -Psupt < $1
rm -f $1
```

The argument `$1` is the filename handed to the shell by Mentat. If there is more than one printer on-line, the *psgray* and *pcolor* shell scripts can be used to address these other printers.

## Xdump

The *xwd* command, widely available on many platforms, dumps an image of an X window into a specially formatted dump file. This file can then be read by various other X utilities for redisplay, printing, editing, formatting, and archiving. Its complementary *xpr* command takes the window dump file as input and formats its output for a particular device, such as a PostScript printer or a HP PaintJet (color mode). Below is an example of a shell script that uses *xwd*, and, in conjunction with *xpr*, sends the information to printer *pjetxl*. See the man pages on your system for more details.

```
#!/bin/csh
xwd | xpr -device pjetxl -scale 2 | /etc/aprint -Abatphone2 -L25
```

## Edit

The *edit\_window* shell script is used to control the editor associated with the `EDIT` commands. It is possible to change the type of editor, for example, from *vi* to *emacs* or change the type of windowing environment.

## System Shell

The *system\_window* shell script is used to control the type of window opened with the `system_shell` command. It is possible to change the type of window.

## Parallel Render

The *marc\_render* shell script can be modified such that the photorealistic rendering is performed across multiple CPUs. The parameter *nbands* is used to specify the number of CPUs.

## MPEG Playback

The *mpeg\_window* shell script is used to control the program opened with the `play_mpeg` command.

# Chapter 8: Managing FLEXlm with Marc and Mentat

## FLEXlm License File

FLEXlm is the network based licensing product from Macrovision Software used in MSC products. The license file, `license.dat`, should be placed in the `<parent>/flexlm/licenses` directory once you receive your licenses from your nearest MSC.Software Corporation office. Everyone should have read permission to the file. The license file has the following format:

| Line       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SERVER     | This line specifies the license server. It has the format:<br>SERVER hostname hostid port                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| DAEMON     | This line specifies the name of the vendor daemon (MSC), and the path. It has the format:<br>DAEMON MSC <parent>/flexlm/<platform>/msc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| FEATURE    | <p>This line lists the feature or license names. This line <u>cannot</u> be modified from what is sent to you. For your Marc license, it has the format:</p> <p>FEATURE MARC MSC 2010.1231 (for single processor version)<br/>FEATURE MARC_Parallel MSC 2010.1231 (for parallel version)</p> <p>For your Mentat license, it has the format:</p> <p>FEATURE MENTAT MSC 2010.1231</p> <p>Each single-processor job is required to have a license name MARC for execution to proceed. To run a multiprocessor job, a corresponding number of multiple licenses with the feature name MARC_Parallel plus a license name MARC is required. For example, to run a job using four processors in parallel, one MARC license and four MARC_Parallel licenses are needed.</p> |
| USE_SERVER | When used together with the SERVER line, this line is used on the licensed “client system” (as opposed to the license server), to specify that it should obtain a license from the specified license server. It has no options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| CAMPUS     | This line specifies that a pool of license tokens are used. When the MasterKey licensing system is used, the FEATURE line will have a specification for <code>VENDOR_STRING</code> containing <code>GROUP: CAMPUS</code> and <code>BLV: nn</code> , where <code>nn</code> is the number of tokens that is required in order to obtain a license. All MSC.Software products may obtain a license from a MasterKey license provided that a corresponding FEATURE line exists.                                                                                                                                                                                                                                                                                         |

## FLEXlm License Manager

The `run_marc` and `mentat` script will start the FLEXlm license manager daemon `lmgrd` using the `rc.lmgrd` script located in the `flexlm/<platform>` directory. Once `lmgrd` is running, it reads the license file `license.dat` which is located in the `flexlm/licenses` directory. The license file contains the MSC.Software license (and other MSC.Software product licenses, if necessary). In addition, `lmgrd` also starts the MSC.Software vendor daemon `msc`. The path to `msc` is specified in the license file on the `DAEMON` line. These processes must be running on the license server for the MSC.Software security system to obtain a license.

Marc and Mentat contact these daemons at regular intervals. If no contact is made after a specified time period, Marc or Mentat terminates execution.

For the 2008r1 version, the FLEXlm License Manager must be at version 10.8.6 or higher.

When the security programs are installed, they will be upgraded to version 10.8.6. You should stop the FLEXlm License Manager before installing the product so that the programs can be updated. If your license server is a remote machine, then you need to update the FLEXlm programs on the server before attempting to run the product. If you do not have a CD-ROM for that platform, the programs may be downloaded from:

```
ftp://ftp.mscsoftware.com/pub/msc-products/system_util/flexlm/v10.8.6
```

There is a *readme* file which will tell you which zip file to download, and an *install* file which will provide instructions for installing the programs.

## Environment Variables

The environment variable **MSC\_LICENSE\_FILE** is used to specify the full path to the `license.dat` file, and is a colon separated list of file pathnames. An example setting of `MSC_LICENSE_FILE` is:

```
MSC_LICENSE_FILE=$DIR/./flexlm/licenses/license.dat:/usr/local/flexlm/licenses/license.dat:1515@mars.earth.com
```

The variable must be set in your environment, or optionally could be inserted in the `run_marc` or `mentat` script. The default setting is `$DIR/./flexlm/licenses/license.dat`, where `$DIR` is the path to the Marc or Mentat directory. Note that the FLEXlm license manager must be running before Marc or Mentat executes. This has changed from previous versions where it would startup the license manager automatically if it wasn't already running.

---

**Note:** You may want to combine all of your FLEXlm licenses into one file and change the `FLEXDIR` setting appropriately. For instance, if you have already installed other MSC products and the MSC daemon has been activated.

---

## Security Directory

The security directory defaults to `<parent>/flexlm`. It must be writable by all Marc and Mentat users if they will be allowed to start the license manager when needed, since `lmgrd` writes the logfile (`flexlm/flexlm.log`) to that directory. If you do not wish to have the security directory writable by others, then you must have the license manager started at boot time.

You may also want to monitor the size of the logfile, since all FLEXlm activity is recorded to that file.

---

**Note:** The `flexlm.log` file contains important status information regarding the license manager daemon. Always check this file when you get a security error.

---

## Combining the Marc License with Other MSC Products

You can combine the Marc license with other MSC product licenses. To do this, add the Marc license to the license file for MSC.Nastran, MSC.Patran, or other MSC.Software products. You will need to restart the license server before using Marc.

## Client/Server Licensing

The default installation assumes that the system in which Marc is installed, functions as the license server. The term license server only refers to the fact that `lmgrd` and `msc` are running on that system, and maintains the state of available licenses. Even if you have purchased a nodelocked license, the nodelocked system functions as the license server for that license. A nodelocked license can be distinguished from a floating license since it will have a `HOSTID=xxx` in the feature line.

If you have purchased a floating license, the system that is to be the license server must be determined before generating the system identification file (`sid001.dat`). You must generate the system identification file from the license server, since the `lmhostid` value of the server is needed to generate your passwords. The license file that is returned to you should be placed in the `flexlm` directory. The client systems can use the same license file, or they can use a brief license file with just the `SERVER` and `USE_SERVER` lines.

If you are using a license server and `lmgrd` will always be running, then you may wish to remove or rename the `rc.lmgrd` script started by the `run_marc` and `mentat` script so that it does not attempt to start the license manager on the client.

## MasterKey Licensing

The MasterKey licensing option allows you to use a pool of licenses for all of the MSC.Software products. A MasterKey license is issued with a pool of “tokens”. Each MSC.Software product will attempt to retrieve a specified number of these tokens in order to be granted a license. If not enough tokens are available, then it will be queued. Programs that are queued will be granted a license in the order in which they request a license. For example, if there are 100 tokens and a request is made for 60 tokens, that program will be granted a license. If another program makes a request for 60 tokens, it will be placed in the license queue. If yet another program makes a request for 40 tokens, it will be queued



behind the request for 60 tokens. When the program that was using the 60 tokens exits and releases its tokens, the queued request for 60 tokens will then be granted a license. Then the queued request for 40 tokens will be granted a license.

The amount of minutes a program will wait for a license after it has been queued may be specified with the environment variable `MSC_AUTHQUE`. The default value is 5 minutes. It may be set as follows in a Bourne shell:

```
MSC_AUTHQUE=20
export MSC_AUTHQUE
```

In a C shell, it may be set as:

```
setenv MSC_AUTHQUE 20
```

## Product Layout

When you install Marc and/or Mentat, you will get the following installation hierarchy:

```
<Parent>
├── install           contains the install.exe script and other installation scripts
├── flexlm           contains the FLEXlm programs
├── marc2008r1       contains the Marc program files (if installed)
└── mentat2008r1    contains the MSC.MSC Mentat program files (if installed)
```

In the `run_marc` script, the environment variables involved with the FLEXlm security are set as follows:

```
DIR=<parent>/marc2008r1
FLEXDIR=$DIR/../../flexlm/licenses
```

In the `mentat` script, the environment variables involved with the FLEXlm security are set as follows:

```
DIR=<parent>/mentat2008r1
FLEXDIR=$DIR/../../flexlm/licenses
```

# Appendix A:Sample Installation of Marc and Mentat

In this appendix, a sample installation, assuming a single license installation for Linux 64-bit, is demonstrated.

**Step 1:**  
**Start the**  
**installation**  
**script on the**  
**CD-ROM**

**Step 2:**  
**Extract the files**  
**from the**  
**CD-ROM**

**Marc**  
**Installation**

<cdrom\_dir>/  
install.exe

Enter the path

Select option 1

In most cases, the name of <cdrom\_dir> will be /cdrom or /CDROM. The device name for your CD-ROM may be different, so check your system administration guide. For example, on a Sun the name may be /cdrom/cdrom0.

**Welcome to the Marc installation script for Unix systems**

Enter a valid pathname to the directory to install the software (<current directory>).

**/opt/marc**

**Marc Installation script for Unix systems**  
MSC.Software Corporation  
Main menu

- 1 ) Install/Test Marc
- 2 ) Install Mentat
- o) Options
- ? ) Help information
- q ) Exit from the installation script

Selection: **1**

- MSC.Software Corporation  
Marc 2008 r1 Menu
- H1)Install for HP-UX 11.00 PA2.0 LP64 (~400 MB)
  - H2)Install for HP-UX 11.00 PA2.0 ILP64 (~400 MB)
  - H3)Install for HP-UX 11.23 Itanium 2 LP64(~400 MB)
  - H4)Install for HP-UX 11.23 Itanium 2 ILP64(~400 MB)
  - I1) Install for IBM AIX 5.2 LP64 (~450 MB)
  - I2) Install for IBM AIX 5.2 ILP64 (~450 MB)
  - L1 Install for Linux 2.6 IA32 Redhat AS 4 (~450 MB)
  - L2) Install for Linux 2.6  
Opteron RHEL 4 LP64 (~450 MB)
  - L3 Install for Linux 2.4.x  
(IA64 RHEL 3 LP64) (~450 MB)

|                                        |                                                                  |
|----------------------------------------|------------------------------------------------------------------|
|                                        | L4) Install for Linux 2.4<br>IA64 RHEL 3 - ILP64 (~500 MB)       |
|                                        | L5) Install for Linux 2.6<br>EMT64/AMD RHEL 4 - LP64 (~450 MB)   |
|                                        | L6) Install for Linux 2.6<br>EMT64/AMD RHEL 4 - ILP64 (~450 MB)  |
|                                        | G3) Install for SGI Altix Itanium LP64 (~500 MB)                 |
|                                        | G4) Install for SGI Altix Itanium ILP64 (~500 MB)                |
|                                        | S1) Install for Sun Solaris 10 Ultra III LP64 (~500 MB)          |
|                                        | S2) Install for Sun Solaris 10 Ultra III ILP64 (~300 MB)         |
|                                        | t ) Test and maintain the installation                           |
|                                        | ? ) Help information                                             |
|                                        | r ) Return to previous menu                                      |
| Select option G2                       | <i>Selection [L2]: L2</i>                                        |
|                                        | You have selected Linux 2.6 Opteron RHEL 4 LP64.                 |
|                                        | Is this correct? [Y/n] <b>y</b>                                  |
| Make your choice.                      | <i>Installing Marc Marc 2008 r1 for Linux Opteron</i>            |
| You must be root to<br>create the link | <i>RHEL 4 LP64</i>                                               |
|                                        | Installing the script files to /opt/marc/install                 |
|                                        | Installing the security files in /opt/marc/flexlm/irix           |
|                                        | Installing from /cdrom/products/al26amd4.k08                     |
|                                        | include script adjusted                                          |
|                                        | run_marc script adjusted                                         |
|                                        | <i>Do you want to create links to the marc's startup scripts</i> |
|                                        | <i>[y/N] ? n</i>                                                 |
|                                        | Hit return to continue                                           |

Mentat  
Installation

MSC.Software Corporation  
Mentat 2008 r1 Menu

h1) Install for HP-UX 11.00 PA2.0 (~850 MB)  
h2) Install for HP-UX 11.22 Itanium 2 (~850 MB)  
i1) Install for IBM AIX 5.2 (~800 MB)  
11) Install for Linux 2.4 IA32 RHEL 3 (~750 MB)  
12) Install for Linux 2.4 EM64T/AMD RHEL 3 (~750 MB)  
14) Install for Linux 2.4 IA64 RHEL 3 (~750 MB)  
13) Install for Linux 2.4 (EM64T/AMD RHEL 3 (~750 MB)  
g3) Install for SGI IRIX64 R12K 6.5 (~750 MB)  
s1) Install for Sun Solaris 9 Ultra III (~750 MB)  
?) Help information  
r) Return to previous menu

Select option g1

*Selection [12]: 12*  
*You have selected Linux 2.4 EM64T/AMD RHEL 3*  
Is this correct? [Y/n]: y  
Installing Mentat 2008 r1 for Linux 2.4  
EM64T/AMD RHEL 3  
Installing the script files to /opt/marc/install  
Do you want to replace /opt/marc/flexlm/irix ?  
[y/N] n  
/opt/marc/flexlm/irix is not empty  
No new flexlm files are installed  
Installing from /cdrom/products/gl240amd.k08  
*Enter the pathname to the directory containing the solver:*  
[/opt/marc/marc2008r1]  
Hit return to continue  
mentat script adjusted  
mrun script adjusted  
submit1 script adjusted  
submit2 script adjusted  
submit3 script adjusted  
kill1 script adjusted  
kill2 script adjusted  
kill3 script adjusted

Enter the path to the  
marc2008r1  
directory.  
You can use the  
default selection by  
just pressing the  
enter key.

|                   |                     |                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Make your choice    | Do you want to create links to the mentat's startup scripts<br>[y/N] ? <b>n</b><br>Hit return to continue                                                                                                                                                                                                                                                                                                |
| <b>Step 3:</b>    | Return to main menu | r) Return to previous menu                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Step 4:</b>    | Go to options menu  | o) Options                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Options</b>    |                     |                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Step 5:</b>    |                     | s ) <i>Install Security</i>                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Security</b>   |                     | sd) <i>Install Security documentation</i>                                                                                                                                                                                                                                                                                                                                                                |
|                   |                     | u ) <i>Update Product scripts</i>                                                                                                                                                                                                                                                                                                                                                                        |
|                   |                     | r ) <i>Remove (un-install) a product</i>                                                                                                                                                                                                                                                                                                                                                                 |
|                   |                     | ci) <i>Change the installation directory</i>                                                                                                                                                                                                                                                                                                                                                             |
|                   |                     | cd) <i>Change the CDROM path</i>                                                                                                                                                                                                                                                                                                                                                                         |
|                   |                     | l ) <i>Change the product listing file</i>                                                                                                                                                                                                                                                                                                                                                               |
|                   |                     | sc) <i>Determining system configuration</i>                                                                                                                                                                                                                                                                                                                                                              |
|                   |                     | <i>Selection: S</i>                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Step 6:</b>    | Select option 1     | <b>Security submenu</b>                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Generate a</b> |                     | 1) <i>Generate system identifier file</i>                                                                                                                                                                                                                                                                                                                                                                |
| <b>system</b>     |                     | 2) <i>Show the system identifier</i>                                                                                                                                                                                                                                                                                                                                                                     |
| <b>identifier</b> |                     | 3) <i>Print the system identifier</i>                                                                                                                                                                                                                                                                                                                                                                    |
|                   |                     | 4) <i>Send the system identifier</i>                                                                                                                                                                                                                                                                                                                                                                     |
|                   |                     | 5) <i>Reset the license manager (lmreread)</i>                                                                                                                                                                                                                                                                                                                                                           |
|                   |                     | 6) <i>Start the license manager daemon</i>                                                                                                                                                                                                                                                                                                                                                               |
|                   |                     | 7) <i>Stop the license manager daemon</i>                                                                                                                                                                                                                                                                                                                                                                |
|                   |                     | ? ) <i>Help</i>                                                                                                                                                                                                                                                                                                                                                                                          |
|                   |                     | r) <i>Return to previous menu</i>                                                                                                                                                                                                                                                                                                                                                                        |
|                   |                     | <i>Selection: I</i>                                                                                                                                                                                                                                                                                                                                                                                      |
| Enter your data   |                     | <i>Please enter the following information:</i><br><i>Your company name ( ) : <b>PieMontVue Inc.</b></i><br><i>Your department ( ) :</i><br><i>Your company address ( ) : <b>101 Grant St.</b></i><br><i>City and postal code ( ) : <b>Woodsland, Ca 97001</b></i><br><i>Country ( ) : <b>USA</b></i><br><i>Your name ( ) : <b>Pat Smith</b></i><br><i>Your email address ( ) : <b>psmith@pie.com</b></i> |

|                                                                                                     |                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                     | <p>If you are installing both Marc and Mentat, enter both of your license codes.</p>                                           | <p><i>Your telephone number () :</i> <b>498 8779221</b></p> <p><i>Your telefax number () :</i> <b>498 8770101</b></p> <p><i>Current system data :</i></p> <p><i>Computer type () :</i> <b>Dell</b></p> <p><i>Computer model () :</i> <b>Precision</b></p> <p><i>MSC license agreement number (optional) () :</i></p> <p><i>Amendment number (optional) () :</i></p> <p><i>Any changes (y/n) [n] ?</i> <b>n</b></p> <p><i>**** Data written in file “/opt/marc/install/sid001.dat”</i></p> <p><i>Send this file to Marc</i></p> <p><i>Selection:</i> <b>4</b></p> |
| <p><b>Step 7:</b><br/>Send the system identifier to the nearest MSC.Software Corporation office</p> | <p>Select option <b>3</b> to print, or <b>4</b> for E-mail</p>                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p><b>Step 8:</b><br/>Enter passwords</p>                                                           | <p><i>vi license.dat</i></p> <p><i>chmod 644 license.dat</i></p> <p>Select option <b>q</b> to exit the installation script</p> | <p>When you receive your passwords from MSC.Software, edit or create the</p> <p>&lt;parent&gt;/flexlm/licenses/license.dat file and add the license data sent to you. It will consist of at least three lines: a SERVER line, a DAEMON line, and a FEATURE line. See Macrovision’s <i>FLEXlm End User Manual</i> for more information.</p> <p><i>Selection:</i> <b>q</b></p>                                                                                                                                                                                     |
| <p><b>Step 9:</b><br/>umount and mount the CDs</p>                                                  | <p>Follow the directions in <a href="#">Table 1</a>.</p>                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p><b>Step 10:</b><br/>Install documentations</p>                                                   | <p>Enter the path</p>                                                                                                          | <p><b>Welcome to the Marc installation script for Unix systems</b></p> <p>Enter a valid pathname to the directory to install the software (&lt;current directory&gt;).</p> <p><b>/opt/marc</b></p>                                                                                                                                                                                                                                                                                                                                                               |

Select option d

***Marc Installation script for Unix systems***

*MSC.Software Corporation*

*Main menu*

*d) Install Documentations*

*o) Options*

*? ) Help information*

*q ) Exit from the installation script*

*Selection: **d***

*Installing documetation at*

*/opt/marc/mentat2008r1/doc*

*Hit return to continue.*

## Appendix B: Troubleshooting

- |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cannot read CD-ROM</b> | <ul style="list-style-type: none"> <li>• The device name listed in <a href="#">Table 1</a> may be incorrect for your system. Please consult your system manager.</li> <li>• The CD-ROM device may not be mounted. Please consult your system manager.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Cannot create</b>      | <ul style="list-style-type: none"> <li>• You have no write permission in the parent directory. Change with <i>chmod</i>.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Security failed</b>    | <p>Marc or Mentat was unable to obtain a license from the FLEXlm licensing software. In this case, Marc or Mentat will exit. The possible causes for this are:</p> <ul style="list-style-type: none"> <li>• The FLEXlm license manager is missing or cannot be executed due to permission problems. Check the log file <code>flexlm.log</code> in the <code>flexlm</code> directory. Try testing the FLEXlm license server with the command <code>flexlm/lmstat</code>. If this fails, consult the <i>FLEXlm End User Manual</i>.</li> <li>• You are attempting to run on a machine that according to the Marc password(s) you are not allowed to use.</li> <li>• Your license period has expired. Check the date on your machine.</li> <li>• For counted licenses, currently running too many Marc jobs. Try later. If the limit has not been exceeded, try restarting the license manager, <code>lmgrd</code> and the vendor daemon <code>MSC</code>. Make sure no other Marc jobs are running.</li> <li>• If you have just modified the <code>license.dat</code> file, the <code>lmgrd</code> and <code>MSC</code> daemons may not have been restarted. Run the <i>lmreread</i> utility as follows:             <pre>lmreread -c "parent"/flexlm/licenses/license.dat</pre> </li> <li>• If you get the FLEXlm error:             <pre>Invalid (inconsistent) license key (-8,130:2) No such file or directory</pre>             it may be implying that the <code>hostid</code> value specified on the <code>SERVER</code> line are inconsistent with the passwords. Check the values and restart the license manager.           </li> <li>• If you get the FLEXlm error:             <pre>Cannot connect to license server (-15,12:146)</pre>             and you are using a floating license, the license manager (<code>lmgrd</code>) may not be running on the license server, or the <code>USE_SERVER</code> line in your client side <code>license.dat</code> file is incorrect. Also make sure that the TCP/IP port numbers used on the <code>SERVER</code> line are the same on both the client and the server.           </li> <li>• If you get the FLEXlm error:             <pre>No such feature exists (-5,147)</pre>             and your license is limited to certain systems, you may be trying to run on a system that is not licensed for use. Check that the <i>lmhostid</i> of the system you are trying to use and that on your <code>marc2008r1 (FEATURE MARC)</code> license is the same.           </li> </ul> |



- Link failed in Marc**
- Your user subroutine causes compiler errors.
  - You have no FORTRAN compiler.
  - Fortran libraries not available.
  - Check the variable **syslibs** in the file *include* in the `marc2008r1` subdirectory `tools`. It references special system libraries in `/usr/lib` which may not exist on your system.
- Testing Marc Installation fail**
- If you are using `install.exe` to test Marc installation and the Test and maintain installation does not respond, remove `exec tcsh` from your `.cshrc` and restart installation testing.
- Mentat cannot open the display**
- Make sure Mentat has X server access to your display device. The command: `xhost +` allows Mentat to run on a remote screen. This command must be issued while logged onto the computer that owns the remote screen.
  - If you are using a terminal other than the default screen belonging to the machine, you may have to set the X-window output device:  
C-shell:        `setenv DISPLAY your_terminal_name:0.0`  
Bourne shell: `DISPLAY=your_terminal_name:0.0 export DISPLAY`
- Mentat runs OK, then aborts**
- This may happen when the model you are working on becomes very large. Mentat requires a considerable amount of memory to store the model. We advise that a minimum of 128 MB core memory is available in your machine.
  - You can save memory by switching UNDO off in the SPEED menu.

## Appendix C: Marc/Mentat Files and Subdirectories

The Marc version you have received contains a full set of subdirectories listed below. You can save disk space by removing the subsets that you do not need.

Table 5 Contents of the Marc Distribution CD-ROM

| Basic set:                                                              | Contents: required as minimum                                                                                                                       |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>bin</b>                                                              | executable Marc programs                                                                                                                            |
| <b>tools</b>                                                            | shell scripts to run and maintain the Marc programs                                                                                                 |
| <b>../flexlm</b>                                                        | FLEXlm security files                                                                                                                               |
| <b>AF_flowmat</b>                                                       | material data for database                                                                                                                          |
| <b>doc</b>                                                              | Installation Guide, Release Guide and Volumes A-E<br>installed from the documentation CD-ROM<br>installed in this directory Mentat is not installed |
| Extended set:                                                           | Contents: only for use with user subroutines                                                                                                        |
| <b>common</b>                                                           | insert files containing Marc common blocks                                                                                                          |
| <b>lib</b>                                                              | binary libraries with the compiled Marc routines                                                                                                    |
| <b>user</b>                                                             | templates for all available Marc user subroutines                                                                                                   |
| Examples:                                                               | Contents: example files                                                                                                                             |
| <b>demo</b>                                                             | input files and user subroutines for the <i>Marc Volume E: Demonstration Problems</i>                                                               |
| <b>demo_ddm</b>                                                         | input files and user subroutines for the single parallel machine as well as the network parallel version of Marc                                    |
| <b>demo_table</b>                                                       | input files and user subroutines for the Marc Volume E: Demonstration Problems based upon Table driven input format.                                |
| <b>benchmark</b>                                                        | small set of demonstration examples for performance measurement                                                                                     |
| <b>test_ddm</b>                                                         | one, two, and four processor test examples for installation testing of the single parallel machine as well as the network parallel version          |
| Utilities:                                                              | Contents:                                                                                                                                           |
| <b>pldump</b>                                                           | source routines for the post-file conversion program pldump                                                                                         |
| <b>pldump2000</b>                                                       | source routines for the post-file conversion program pldump2000                                                                                     |
| <b>hpmpl,<br/>intelmpl</b>                                              | MPI libraries for network parallel version                                                                                                          |
| *Note that the last set is available on SOURCE code license tapes only. |                                                                                                                                                     |

The Mentat version you have received contains a full set of subdirectories listed below. You can save disk space by removing the subsets that you do not need.

Table 6 Contents of the Mentat directory unloaded from CD-ROM

| <b>Basic set:</b>    | <b>Contents: required as minimum</b>                                                              |
|----------------------|---------------------------------------------------------------------------------------------------|
| <b>bin</b>           | shell scripts and programs for Mentat                                                             |
| <b>help</b>          | Mentat online help files                                                                          |
| <b>materials</b>     | Mentat material files                                                                             |
| <b>menus</b>         | Mentat menu files                                                                                 |
| <b>doc</b>           | Installation Guide, Release Guide and Marc Volumes A-E<br>installed from the documentation CD-ROM |
| <b>Extended set:</b> | <b>Contents: example Mentat procedure files</b>                                                   |
| <b>examples</b>      | sample Mentat procedure files                                                                     |

Table 7 Contents of the Flexlm/<platform> directory unloaded from CD-ROM

| <b>Program</b>                                              | <b>Description</b>                                                          |
|-------------------------------------------------------------|-----------------------------------------------------------------------------|
| <b>lmcksum</b>                                              | performs a checksum of the license file                                     |
| <b>lmdiag</b>                                               | diagnose a problem with checking out a license                              |
| <b>lmdown</b>                                               | shutdowns the license daemons                                               |
| <b>lmgrd</b>                                                | the main license manager daemon for Flexlm                                  |
| <b>lmhostid</b>                                             | prints the hostid of a system                                               |
| <b>lmremove</b>                                             | allows you to remove a single user's license                                |
| <b>lmreread</b>                                             | causes the license manager to reread the license file                       |
| <b>lmstat</b>                                               | helps you monitor the status of all network licensing activities            |
| <b>lmswitchr</b>                                            | switches the FLEXadmin log file for the specified feature                   |
| <b>lmutil</b>                                               | The executable to which the FLEXlm utilities are linked                     |
| <b>lmver</b>                                                | Lists the FLEXlm version of a library or executable                         |
| <b>msc</b>                                                  | The vendor daemon used to pass Marc specific licensing information to lmgrd |
| <b>rc.lmgrd</b>                                             | The script that starts lmgrd                                                |
| See the <i>FLEXlm End User Manual</i> for more information. |                                                                             |



# Marc Parallel Network for Unix Installation and Operations Guide

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General Information

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# Introduction

The current document is divided into three parts:

- Part I

Provides the general description about the hardware and software requirements and definitions.
- Part II

Provides a step-by-step approach to installation of the network version.
- Part III

Provides miscellaneous information about executing a parallel job over a network and use of user subroutines.

The list of supported capabilities in parallel can be found in Section 7 of the Release Guide.

## Part 1 General Information

### Hardware and Software Requirements:

For Linux IA64 and EM64T platforms the default MPI is HP MPI from Hewlett-Packard Development Company, L.P. Intel MPI from Intel Corporation is also supported and can be used by switching to it using the maintain script under the marc tools directory.

To use the Intel MPI (iMPI), please observe the following.

- a. Create a .mpd.conf file in your home directory that contains the following line.

```
secretword=<your mpd password>
```

where <your mpd password> can be any arbitrary string.

Change mode of the .mpd.conf to 600, i.e. do a

```
chmod 600 $HOME/.mpd.conf
```

- b. Setup a mpd.hosts file in your home directory consists of the names of nodes in your cluster (it can have only 1 node, i.e. 1 line):

```
clusternode1
```

```
clusternode2
```

```
clusternode3
```

The rest is taken care of by the run\_marc script.

However, if your cluster requires password to perform ssh or rsh between nodes, you may need to enter your password every time you are running a parallel job. You can disable the password requirement in the use of ssh or rsh. Please consult your system administrator.

**Note:** There is a conflict between the libdl.so.2 in the /lib/lib\_shared directory of the Linux IA64 release which was built in RHEL 3 with the /lib/libdl.so.2 in RHEL 4 platforms. Simply rename the lib\_shared directory when running on IA64 RHEL 4 systems.

Although no specific hardware requirements exist for Marc to run in network mode, it is preferable to have fast network connections between the machines. It is recommended that the network should have a speed of at least 100 MBit per second. If only two machines are to be used, a hub or a cross-over cable can be used to connect them. If more than two machines are to be used, a switch is preferable. TCP/IP is used for communications.

For a list of supported Unix platforms, see the *Release Guide, Section 7*.

### Compatibility:

Although it is possible to connect different Unix machines, it is recommended to only use compatible machines in an analysis. Two machines are compatible if they can both use the same Marc executable.

Some examples of compatible machines are:

1. Several machines with exactly the same processor type and O/S.

2. One SGI R8000/Irix 6.5 and one SGI R10000/Irix 6.5 machine.
3. One HP J-Class/HPUX-11.0 and one HP C-Class/HPUX-11.0.

---

**Note:** The HP Alpha Tru64 machines cannot be connected to other Unix machines in this release.

---

## Definitions

1. Root machine:  
The machine on which the Marc job is started.
2. Remote machine:  
Any machine other than the root machine which is part of a distributed Marc run on the network.
3. Shared installation:  
Marc is installed in an NFS shared directory on one machine only. Other machines can access the Marc executable since the directory is shared.
4. Distributed installation:  
Marc is installed on all machines. Each machine accesses its own Marc executable.
5. Distributed execution:  
Marc is run on multiple machines which are connected with a network. Each machine loads the Marc executable either from a shared or a local directory and then executes the executable.
6. Shared I/O:  
Marc reads and writes data in an NFS shared directory. Each Marc executable running on the network reads/writes to the same directory.
7. Distributed I/O:  
Marc reads and writes data in a directory located on each machine. The user must make the input available in each directory and collect the results files after the analysis.
8. NFS – Network File System.

## Network Configuration

Marc only needs to be installed on the root machine where the installation directory is shared via NFS (shared installation). Marc can also be installed on the remote machines which then use their own executable (distributed installation). A distributed installation must be done if incompatible machines are used. The root machine is the one on which the Marc job is started, typically from within Mentat. The remote machines can be located anywhere as long as they are connected to the network. The working directory on each machine can be a shared directory on any machine on the network (shared I/O) or it can be a local directory on the hard disk of each machine in the analysis (distributed I/O). The User Notes describes how to specify what working directory to use.



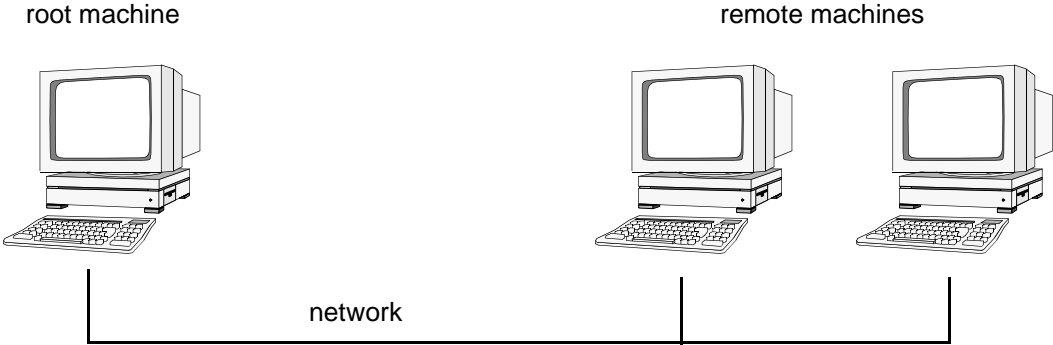


Figure 1 Network Configuration

## Part 2 Installation Notes

This part describes the specific steps needed to install and set up a network version of Marc. For general information on Marc installation, see [Marc and Mentat for Unix Installation and Operations Guide](#).

Install Marc on the root machine and, if needed, on the remote machines. Marc only needs to be installed on the root machine. However, if Marc is to be used on the remote machines as well, it can also be installed there. There is nothing special that needs to be done related to the installation itself for the network version.

In order to run parallel jobs on machines connected over the network, it has to be set up properly. If any of the remote hosts does not have Marc installed, the installation directory on the root machine needs to be shared using NFS or some other mechanism so that the Marc executable is available from the remote machines. Users need to be able to connect between the machines using `rlogin` without having to provide a password.

Assume the following, there are two machines with hostnames `host1` and `host2` that are to be used in a parallel job over the network. Marc has been installed on `host1` and the job is to be started from this machine. A hypothetical naming convention is used for shared directories where a directory name on any machine starts with `/nfs/hostname`, where *hostname* is the name of the machine on which the directory is located.

First, test the installation for single processor execution. Change directory to the `test_ddm` subdirectory of the Marc installation directory on `host1`. Then do

```
cd exmpl2/exmpl2_1
marc2008r1 -j cyl2 -b no -v no
```

and Marc should exit in about three minutes if it is a successful run.

Then test the Marc installation for multi-processor execution. Do

```
cd ../exmpl2_2
```

and edit the file `hostfile` in this directory by replacing `workdir` with

```
/nfs/host1/marcinstall/test_ddm/examp2/exmpl2_2
```

and `installdir` with

```
/nfs/host1/marcinstall.
```

The host names and directory names should, of course, be replaced with the names on the current system. Finally, type:

```
marc2008r1 -j cyl2 -b no -v no -nproc 2 -host hostfile
```

and Marc should exit in about two minutes if it is a successful, parallel run on `host1` and `host2` using one processor on each.

## Part 3 User Notes

This section assumes that the network version of Marc has been successfully installed on at least one of two machines that are to be used in a distributed analysis and that the appropriate Marc licenses are in order. Assume that `host1` is the host name of the machine on which Mentat is running and from which the job is to be started (the root machine). The host name of the other machine (the remote machine) is `host2`.

### How to run a network job

First, make sure that the two machines are properly connected. From `host1`, access `host2` with

```
rlogin host2
```

If a password needs to be provided to do the remote login, this has to be taken care of. If the `rlogin` is not possible without providing a password, a network run will not be possible. See [Troubleshooting](#) in this case.

In order to perform an analysis over a network, a specific file called *host file* needs to be created by the user. This file defines which machines are to be used, how many processes are to run on each, what working directory should be used, and where the Marc executable can be found on each machine. The host file can be selected and edited in Mentat and the Marc job started as usual from within Mentat (see the example below). If Marc is run from the command line, it is done as for a serial run using an additional command line option. For example:

```
marc2008r1 -v no -b no -jid test -nproc 2 -host hostfile1
```

will run the two-processor job `test.dat` using the specification in the file `hostfile1`. No specific name or extension is used for the host file except that the name *jobid.host* (in this example `test.host`) must be avoided since it is used internally by Marc.

### Specification of the host file

The host file has the following general format:

```
host1 n1
host2 n2 workdir2 installdir2
host3 n3 workdir3 installdir3
```

Each line must start at column 1 (no initial blanks). Blank lines and lines beginning with a `#` (number symbol) are ignored.

The first entry is the host name of a machine to be used in the analysis. The root machine must be listed first and each machine must only occur once.

The second entry specifies the number of processes to run on the machine specified in the first entry. The sum of the number of processes given in the host file must equal the number of domains used. In a five-domain job, it is required that  $n1+n2+n3=5$ .

The third entry specifies the working directory to use on this host. This is where the I/O for this host takes place. The Marc input files for this machine must be in this directory and the results files for this machine are created in this directory.

The fourth entry specifies where the Marc installation directory that this host should use is located. This entry can be omitted if the name of the Marc installation directory is the same on all machines (which could be a shared directory on host1 with the same name from host2 and host3).

The directories in the third and fourth entries will be used from the respective host. To check the correctness of the host file specification, log in to the respective machine and list the directories as specified in the host file. For the host file given above, do:

```
rlogin host2
ls workdir2
ls installdir2
```

The second line should show the working directory to use on host2 and the third line the installation directory which will be used by host2.

The different domains of the Marc job are associated with the different machines as follows. Suppose a five-domain job `test` is run using a host file defined as

```
host1 2
host2 1 workdir2 installdir2
host3 2 workdir3 installdir3
```

with appropriate definitions of the third and fourth entries, see below. There will be six Marc input files associated with this job: `test.dat`, `1test.dat`, ..., `5test.dat`. Domains 1 and 2 will be associated with host1, domain3 with host2 and domains 4 and 5 with host3.

## Shared I/O

Suppose a job is to be run on host1 and host2. A shared directory on host1 is to be used for I/O and from host2 its name is `/nfs/host1/marc/workdir` (assuming a hypothetical naming convention for shared directories which starts with `/nfs/hostname`). The installation directory is assumed to have the same name on both machines. The host file for a two-processor job would simply be

```
host1 1
host2 1 /nfs/host1/marc/workdir
```

To verify the `workdir` given, do `rlogin host2 ; ls /nfs/host1/marc/workdir`. The directory seen should be the same one as the working directory on host1.

## Distributed I/O

If the user wants to have the I/O to be local on host2, specify the host file as

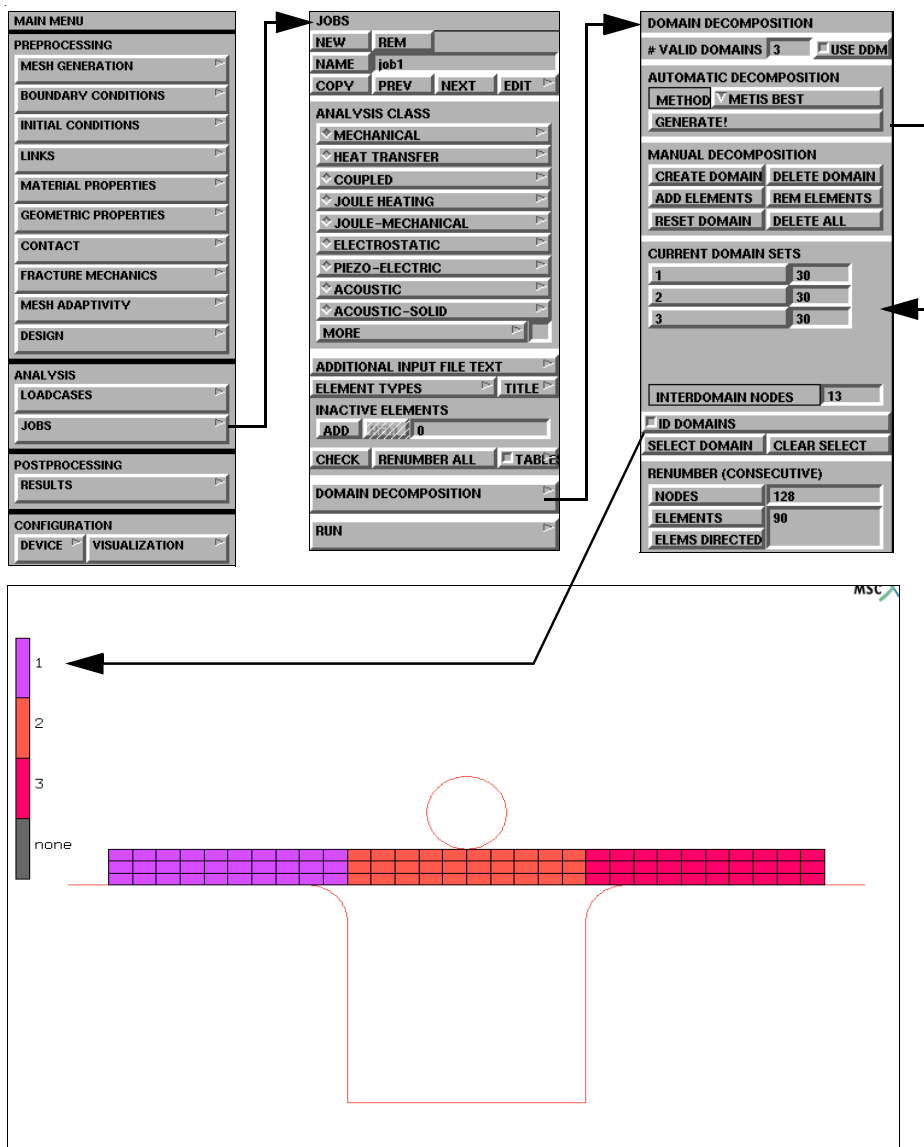
```
host1 1
host2 1 /usr/people/marcuser
```

The I/O on host2 will now take place in the directory `/usr/people/marcuser` on the hard disk of host2. For this case, the Marc input files are transferred to `/usr/people/marcuser` on host2 before the job is started, and the results files are transferred back after the analysis for postprocessing. This transfer of files is done by Marc automatically.

It is also possible to use only two entries in the host file. This requires that both the working directory and the installation directory have the same names on all machines.

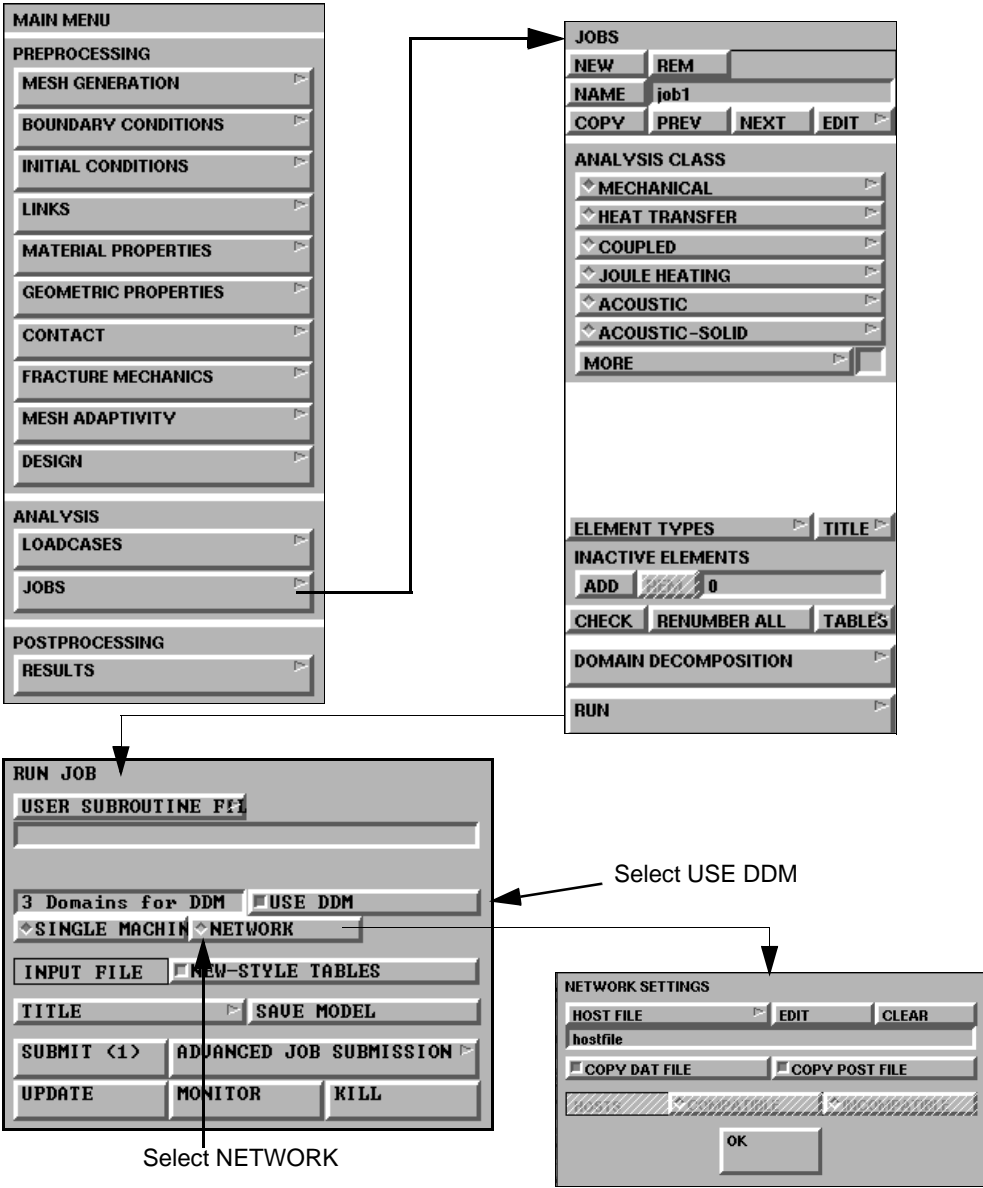
The definitions for a network run with Mentat is demonstrated with a simple example. We assume the simplest case where both the working directory and installation directories are shared.

### Step 1



Activate the DDM and enter the NETWORK SETTINGS menu.

**Step 2**



Select the file hostfile with the HOST FILE button. Edit it by clicking the EDIT button. The hostfile places two domains on host1 and one domain on host2 with the contents:

```
host1 2
host2 1      workdir      installdir
```

Replace workdir and installdir with the full paths to the working and Marc installation directories, respectively.

Run Marc from within Mentat using the SUBMIT button. The following should appear on your screen.

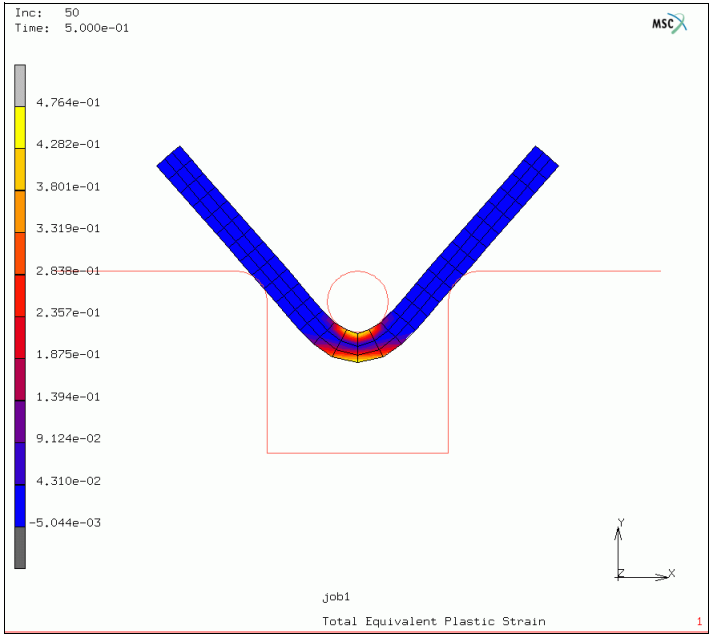
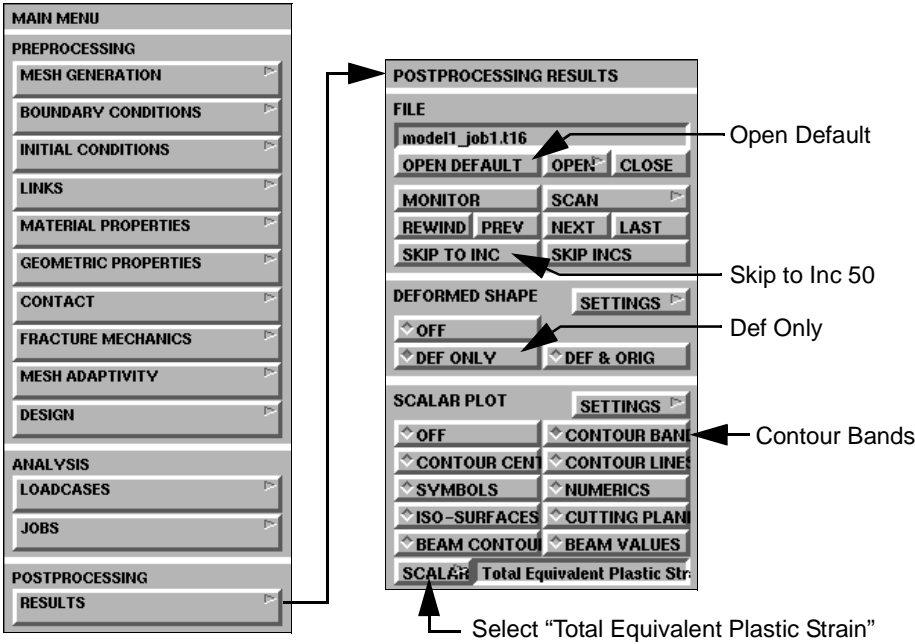
### Step 3

The screenshot shows a dialog box titled "RUN JOB". It contains several fields and buttons:

- A text field labeled "USER SUBROUTINE FILE" with a small icon on the right.
- A section with a label "3 Domains for DDM" and a button "USE DDM".
- A section with two radio buttons: "SINGLE MACHINE" (selected) and "NETWORK".
- A section with a label "INPUT FILE" and a button "NEW-STYLE TABLES".
- A section with a label "TITLE" and a button "SAVE MODEL".
- A section with two buttons: "SUBMIT <1>" and "ADVANCED JOB SUBMISSION".
- A section with three buttons: "UPDATE", "MONITOR", and "KILL".

Check your results.

Step 4





Marc created a post file associated with each domain as well as a root post file associated with the job id. For the previous model, `1model1_job1.t19`, `2model1_job1.t19`, and `3model1_job1.t19` are the processor files, while `model1_job1.t19` is the root file.

If the model is very large, it can be convenient to view only a portion of the model by selecting any one of the processor post files, such as `3model1_job1.t19`. This file contains only data associated with domain 3 as selected in the domain decomposition menu under [Step 4](#). As described in [Step 3](#), this file was created by host2.

## Shared vs. Distributed I/O

For jobs with very large post or restart files, it is usually more efficient to use distributed I/O. With distributed I/O, the input files and the post files are located on the host's local disks. Marc by default automatically transfers the input files and the post files to and from the remote host if needed. It is possible to suppress this transferring with two buttons in the Network settings in the JOBS menu in Mentat.

To run a job using distributed I/O, specify a local directory in the host file:

```
host1 2
host2 1 /usr/people/marcuser
```

## Jobs with User Subroutine

User subroutines are fully supported in the network version.

The Fortran file with the subroutine is located in the working directory on the root machine. Marc automatically creates the executable and makes it available on all remote hosts. There is no need to modify the host file if it is correct for a job without a user subroutine.

If the working directory is shared for all remote hosts and only compatible machines are used in the analysis, the user subroutine is compiled on the root machine and the executable is available in the shared working directory.

If a remote host is using a local working directory, the executable will be automatically copied over to the remote machine using remote copy (`rcp`). Marc automatically knows if a directory is shared or local.

If incompatible machines are used, the compilation is done on each machine separately. If a shared working directory is used, the host name is appended to the name of the executable. For local directories, the new executable is placed in the local working directory. This is all done automatically by Marc. To make sure that incompatible machines are treated as such, use the INCOMPATIBLE button in the Mentat NETWORK SETTINGS menu, or if started from the command line, use the command line option “-comp no”.

## Notes for Incompatible Machines

This version only supports connection of homogeneous networks; that is, machines of the same type. The communication software we use, MPICH, allows heterogeneous networks to be used. You could connect for instance two HPs, three IBMs, two SGIs, and a Sun to run a job. Obviously, the install directories must be local to the different machines in this case.

Restrictions:

1. Hardware vendor provided solver must NOT be used when using different machines on the network.
2. Please note that HP Alpha machines cannot be connected to other Unix machines at this time.

## Solver

Solver type 6 (hardware provided sparse) is available on HP, SGI, and Sun. No specific input is needed for its use in a parallel analysis. Marc makes use of the parallel features of these solvers. However, the use of a hardware solver is, in general, not recommended in a network run. The equation solution is performed on the root machine by starting multiple processes. This is done in order to utilize the parallel performance of the solver (which is using multithreading). This is efficient on a single parallel machine, but if the root machine of a network run does not have the number of processors available, it will not be efficient.

Solver types 0 (direct profile), 2 (sparse iterative), 4 (sparse direct), and 8 (multifrontal sparse) are supported in parallel.

Out-of-core solution is only supported in parallel for Solver 8.

## Troubleshooting

### Check that:

1. The network connection between the hosts is working by using the command `ping host`.
2. A remote login using the command `rlogin` can be done between the hosts without providing a password. If not, contact your system administrator or check the man pages for `rlogin` and look for `.rhosts`.
3. The host names used in the hostfile are correct. It should be the same as the output from the command `hostname` on the respective host.
4. The working and installation directories on the host file are correct. Log onto the remote host, change directory to these directories to verify the host file content. The installation directory given should, among others, contain the executable in the bin directory.
5. The input files for each host are available in the respective working directory. An error message is printed out from Marc if they are not.

### Error messages:

6. The error message “`semget failed...`” at job start-up means that the communication environment is not clean. This can be checked with the Unix command `ipcs`. If entries belonging to specific users except `root` show up, they may need to be removed. Run the script `tools/mpiclean` located in the Marc installation directory.

---

**Note:** This will kill all parallel jobs currently running under the current user.  
Only entries belonging to the current user are deleted.

---

### Other:

1. On some machines, sometimes there are files called `p4_shared_arena_xxxx`, with `xxxx` being some number, left in `/var/tmp`. These can eventually fill up that disk and should be removed.



# Marc and Mentat for Microsoft Windows Installation and Operations Guide

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# Preface

This document describes the installation and usage of the Marc and Mentat programs on Microsoft Windows platforms configured as shown in [Table 8](#). The instructions given here require a basic knowledge of the machine on which you are loading the Marc products, no attempt is made to teach the use of Microsoft Windows commands.

This document contains a quick installation section intended for experienced Marc users, a section containing details about the installation procedure, a section concerning the usage of the Marc and Mentat programs and a section about the license management utility.

Appendices include hints about troubleshooting.

If you encounter a problem during the installation, please contact the customer support staff at the nearest MSC.Software office.

Table 8    Requirements of Marc & Mentat Running on Microsoft Windows

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| <b>Operating System</b> | Microsoft Windows XP Service Pack 2 or higher, which includes Windows Vista               |
| <b>CPU</b>              | Intel Pentium III or higher CPU                                                           |
| <b>Graphics Card</b>    | SVGA or better running in at least 16 bit (64k) color mode                                |
| <b>Hard Drive</b>       | Minimum:<br>500 MB Marc<br>850 MB Mentat                                                  |
| <b>DVD Drive</b>        | Required for media based installation. Not required for electronic download installation. |
| <b>Ethernet Card</b>    | An ethernet card is required. Also, Microsoft TCP/IP Service must be installed.           |
| <b>Mouse</b>            | Three button mouse is recommended                                                         |
| <b>Memory</b>           | Minimum 512 MB<br>Recommended 2 GB                                                        |
| <b>FORTRAN Compiler</b> | Intel Fortran Version 9.1 and Microsoft Visual Studio 2005.                               |

## Chapter 1: Read me first: Installation Prerequisites

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| <b>Before running setup</b>        | <p>Decide where you want the version to be installed before running the <i>Setup</i> program on the DVD. When running <i>Setup</i>, you will be prompted to supply a directory pathname to install the MSC.Software products. In the remainder of this document, the directory that you specify will be referred to as <i>parent</i>. The directories <code>marc2008r1</code>, and <code>mentat2008r1</code>, will be created in the directory that you specify.</p> <p>You must have the TCP/IP networking facility installed on Microsoft Windows. To check the TCP/IP network installation:</p> <ol style="list-style-type: none"> <li>1. Open the Control Panel.</li> <li>2. Select the Network icon.</li> <li>3. Right click on the local area connection that is active and select properties.</li> <li>4. Check to see that the TCP/IP protocol is installed.</li> </ol> <p>Marc also requires an ethernet card, even if the workstation is not connected to a network. Marc uses the ethernet card to create a system ID for FLEXlm licensing.</p> |
| <b>Password protection</b>         | <p>The Marc version you have received is protected against illegal usage by means of Macrovision's FLEXlm licensing software. You <i>cannot</i> run the program directly after you have installed from the DVD until you obtain these passwords. Passwords will be supplied to you from the nearest MSC.Software Corporation office after you have performed the first two steps of the installation procedure. These steps are as follows:</p> <ul style="list-style-type: none"> <li>– Run the setup program, and generate a machine specific identifier for the purpose of creating passwords.</li> <li>– Send the machine specific identifier to the nearest MSC.Software office.</li> <li>– Upon return of the password file, place this file in the <code>MSC.Software\MSC.Licensing\10.8.6</code> directory.</li> <li>– Passwords normally need to be entered only once.</li> </ul>                                                                                                                                                                 |
| <b>Should I be Administrator ?</b> | <p>Normally, there is no need to be logged in as <i>Administrator</i>. However, you will need administrator privileges since the system registry will be updated. Also, check that you have read and write permissions to the installation directory.</p> <hr/> <p><b>Note:</b></p> <p>Vista users that are not logged in as <i>Administrator</i> will need to right-click on the <i>setup.exe</i> program and select <i>Run as administrator</i> in order to obtain administrator privileges.</p> <hr/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| <b>FORTTRAN compiler</b> | <p>A FORTRAN compiler is necessary if user subroutines are to be used. For other cases, no compiler is needed.</p> <hr/> <p><b>Note:</b></p> <p>After you install the FORTRAN compiler, make sure that all users have their “path” and “lib” environment variable include the path to the FORTRAN compiler. Otherwise, using user subroutines will not work properly.</p> <p>See <a href="#">Appendix C: Troubleshooting</a> for important information regarding requirements for the Intel Fortran compiler.</p> <hr/> |
| <b>Computer Name</b>     | <p>Your machine <i>must</i> have a computername (hostname). If no computer-name is known, supply one by using the <b>Control Panel\Network</b> applet to set the “Computer Name”. You should also make sure the “Host Name” specified in the DNS tab of <b>Network\Protocols\TCP/IP Protocol</b> is the same as the “Computer Name”.</p>                                                                                                                                                                                |
| <b>Previous Versions</b> | <p>If you have previous versions of Marc and/or Mentat installed, you may want to adjust your PATH environment variable to remove the reference to the previous version.</p>                                                                                                                                                                                                                                                                                                                                            |



## Chapter 2: Quick Installation Procedure

|                                                                                   |                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| <b>Step 1:</b><br><b>obtain your FLEXlm hostid</b>                                | Browse to the DVD drive using Explorer and double-click <b>setup</b> , or from the Start->Run. menu open <b>d:\setup</b> .<br>Select the MSC.Licensing server software option:<br><input type="checkbox"/> <b>Marc 2008 r1</b><br><input checked="" type="checkbox"/> <b>MSC.Licensing</b> | Start the Setup program.<br>Substitute the drive letter for your DVD drive.<br>Obtain your FLEXlm hostid by selecting the <i>MSC.Licensing</i> product.<br>During installation, it will display your FLEXlm hostid and ask if you want to install the server. You should elect to install the server only after you receive your license file since it will request the location of the license file when installing. |
| <b>Step 2:</b><br><b>send to MSC.Software Corporation and enter the passwords</b> | <pre>cd \msc.software mkdir msc.licensing\10.8.6 cd msc.licensing\10.8.6 notepad license.dat</pre>                                                                                                                                                                                         | Send the hostid information to your nearest MSC.Software office to obtain your passwords.<br>The passwords you receive from the MSC.Software salesperson should be entered by means of creating a file named <i>license.dat</i> in the <i>C:\MSC.Software\MSC.Licensing\10.8.6</i> directory.<br>You may, however, save it anywhere you like.                                                                         |
| <b>Step 3:</b><br><b>install the licensing product</b>                            | Install the MSC.Licensing product:<br><input type="checkbox"/> <b>Marc 2008 r1</b><br><input checked="" type="checkbox"/> <b>MSC.Licensing</b>                                                                                                                                             | Install the <i>MSC.Licensing</i> system next. The Marc 2008 r1 release requires the use of FLEXlm version 10.8.6.<br>The licensing server software will by default be installed in <i>C:\MSC.Software\MSC.Licensing\10.8.6</i><br>Upon completion of installing the server it will ask you to select your license file.                                                                                               |
| <b>Step 4:</b><br><b>install the Marc product</b>                                 | Select the Marc 2008 r1 product from the initial installation screen:<br><input checked="" type="checkbox"/> <b>Marc 2008 r1</b><br><input type="checkbox"/> <b>MSC.Licensing</b>                                                                                                          | Select the <i>Marc 2008 r1</i> product to install.<br>The <b>Welcome</b> banner will appear.<br>Press the <b>Next</b> button to proceed.                                                                                                                                                                                                                                                                              |

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| <b>set location</b>          | Choose Destination Location:<br><i>Destination Folder:</i><br><div>C:\MSC.Software\Marc\2008r1</div><br><i>***</i>                                                                                 | The next screen will prompt you to set the location where you want the products installed. This path is the “parent” directory. It defaults to <b>C:\MSC.Software\Marc\2008r1</b> .<br>The directories <b>marc2008r1</b> and <b>mentat2008r1</b> will be created in the directory that you specify. |
| <b>setup type</b>            | You will then be presented with which product options to install.<br><input type="checkbox"/> <b>Complete</b><br><input type="checkbox"/> <b>Solver</b><br><input type="checkbox"/> <b>Modeler</b> | Select the <b>Complete</b> option to install both Marc and Mentat.<br>Select the <b>Solver</b> option to only install Marc, or select the <b>Modeler</b> option to only install Mentat.                                                                                                             |
| <b>program folder</b>        | Select Program Folder:<br><i>Program Folder:</i><br><div>MSC.Software</div>                                                                                                                        | Select the folder that you wish to place the shortcut to the Mentat startup script. The default program folder name is <b>MSC.Software</b> .                                                                                                                                                        |
| <b>64-bit memory version</b> | <input type="checkbox"/> <b>Marc Solver 32-bit</b><br><input type="checkbox"/> <b>Marc Solver 64-bit (Integer*4)</b><br><input type="checkbox"/> <b>Marc Solver 64-bit (Integer*8)</b>             | This menu will only be displayed on Microsoft Windows 64-bit operating systems.<br>Select the memory version of the 64-bit solver that you wish to install or the 32-bit version if required.                                                                                                       |
| <b>specify license file</b>  | License:<br><div>C:\MSC.Software\MSC.Licensing\10.8.6\license.4</div>                                                                                                                              | When you perform the <i>Marc</i> installation, it will ask for the location of a valid Marc license file.<br>Specify the location of your license file.                                                                                                                                             |
|                              | <input type="checkbox"/> <b>I would like to view the README file.</b>                                                                                                                              | The last screen is the <b>Setup Complete</b> screen. It will present you with an option to view the readme.txt file.<br>Click on the <b>Finish</b> button to leave Setup. Then click on the X button in the lower left hand corner of the main installation menu window or press the escape button. |

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| <b>Step 5:<br/>start the<br/>License<br/>Manager</b> | <p>Start the FLEXlm license manager.</p> <p>You may also want to enable the license manager to run as a service and to start the server at power-up by enabling these options in the Config Services section.</p>                                                                                                                                                                                                                                                                                                                                                                                                  | <p>Select Start-&gt; Programs-&gt; MSC.Software-&gt; MSC.License 10.8.6-&gt; FLEXlm Configuration Utility to configure FLEXlm.</p> <p>Select the <i>Config Services</i> tab and verify that the settings are correct; i.e. the “License File” is set correctly. Then start the license manager from the <i>Start/Stop/Reread</i> tab by pressing the <i>Start Server</i> button.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                      | <b>For Network Version, skip Step 6.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Step 6:<br/>checking</b>                          | <p>Run Mentat by either selecting the Mentat item in the program folder that you chose, or run it from the MS-DOS Command Prompt.</p> <p><b>First check that the variable MSC_LICENSE_FILE is set properly.</b> Use an MS-DOS Command Prompt window and type:</p> <pre>set msc_license_file</pre> <p>If it is not correct, change it using the System applet in the Control Panel.</p> <p>Then run the program using:</p> <pre>cd \msc.software\marc cd 2008r1\mentat2008r1 bin\mentat</pre> <p>Run a Demo problem by selecting the menu buttons:</p> <p>HELP</p> <p>RUN A DEMO PROBLEM</p> <p>COUPLED CONTACT</p> | <p>Check the installation by running Mentat. You have three methods you can use to run Mentat. You may use either the Mentat icon which is created on the desktop, the link in the MSC.Software\MSC.Marc program group, or run it from an MS-DOS Command Prompt window.</p> <p>You <u>must</u> first check that the environment variable MSC_LICENSE_FILE is set properly to the full pathname of your valid license file. If it is not, the product will fail due to licensing.</p> <p>To run from the command prompt, <code>cd</code> to the \parent\mentat2008r1 directory, and enter the command <code>bin\mentat</code> to start Mentat.</p> <p>Check the Mentat program by running one of the standard Marc demonstration examples as proof of a successful installation. From the HELP menu, select RUN A DEMO PROBLEM, and then select the COUPLED CONTACT demo. It will run for 50 increments.</p> |
|                                                      | <p>To check that user subroutines are working by running one of the standard user subroutine demo problems:</p> <pre>cd \msc.software\marc cd 2008r1\marc2008r1\demo run_marc -j e2x4 -u u2x4</pre>                                                                                                                                                                                                                                                                                                                                                                                                                | <p><b>If you have a FORTRAN compiler,</b> run a user subroutine example using:</p> <pre>run_marc -j e2x4 -user u2x4</pre> <p>Marc should give a <b>Marc Exit number 3004.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| <b>Step 7:<br/>for Network<br/>Version only</b> |  | <p>If you will be using the Marc Parallel Network feature, you will need to setup MPICH2. This service is optionally installed on the system when you installed <i>Marc</i>, however you will need to install it on the remote machines. Follow the <a href="#">Marc Parallel Network for Microsoft Windows Installation and Operations Guide</a> (Parts 1 and 2) for important information on installing and running jobs with the network version.</p> |
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## Chapter 3: Installation Procedure Information

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| <b>Step 1:<br/>obtain your<br/>FLEXlm<br/>hostid</b>                                         | <p>From the DVD drive, run the <i>Setup</i> program and select the <i>MSC.Licensing</i> product to obtain your FLEXlm hostid. When you are asked if you want to proceed with Server Installation you should select <b>No</b> at this time.</p> <p>The system identifier may also be found <u>after</u> installing the Server Installation by using the Start menu and selecting Programs-&gt; MSC.Software-&gt; MSC.Licensing 10.8.6-&gt; FLEXlm Configuration Utility. It is listed in the <i>Ethernet Address</i> item under the <i>System Settings</i> tab.</p> <p>The system identifier may also be found by running:</p> <p style="text-align: center;"><i>lmutil -lmhostid</i></p> <p>in the directory <i>c:\msc.software\msc.licensing\10.8.6 .</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Step 2:<br/>send to<br/>MSC.Software<br/>Corporation<br/>and enter your<br/>passwords</b> | <p>Send the FLEXlm identifier to your nearest MSC.Software office.</p> <p>After receiving the passwords, enter them by means of creating the file <i>license.dat</i> in the subdirectory <i>c:\msc.software\msc.licensing\10.8.6 .</i></p> <p>The password will consist of at least 3 lines:</p> <p>“SERVER” line which specifies the system hostname</p> <p>“DAEMON” line which specifies the vendor specific daemon name and path. The path for the MSC daemon must be changed to the location of where you installed the licensing software.</p> <p>“FEATURE” line(s) which specifies the product and options. This line contains the password and the expiration dates.</p> <p>The <b>mentat</b> and the <b>run_marc</b> batch scripts use the global environment variable <i>MSC_LICENSE_FILE</i> to locate the <i>license.dat</i> file. It typically points to the <i>msc.software\msc.licensing\10.8.6\license.dat</i> file. If the file does not exist, then they will use the environment variable <i>LM_LICENSE_FILE</i> to obtain the full pathname for the license file. You may set the <i>LM_LICENSE_FILE</i> variable to point to another license file if you wish.</p> <p>See Macrovision’s <i>FLEXlm End Users Guide</i> for more information on entering your license password.</p> |

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| <b>Step 3:<br/>install<br/>licensing<br/>software</b> | <p>Select the MSC.Licensing product from the DVD. Note that installing the licensing software requires administrator privileges.</p> <p>The licensing product will by default be installed in <b>C:\MSC.Software\MSC.Licensing\10.8.6</b>. You should have your password information saved to a license file on your system. When you install the server software, the installation will request that you specify a license file. If you do not already have one, you may create a blank <code>license.dat</code> in <code>C:\MSC.Software\MSC.Licensing\10.8.6</code>. The installation will tell you that no valid server line was found. It will then ask if you still want to use it, so select Yes to use the file temporarily. When you receive your passwords from your MSC.Software office, save the password data to this file.</p> <p>See Macrovision's <i>FLEXlm End Users Guide</i> for more information on entering your license password.</p> <p>Select the <b>Finish</b> button in Setup. Press the escape key or the <b>X</b> in the lower left corner of the Demoshield window to exit. Logoff from your Windows session and log back in again so that the environment settings will take effect.</p> <hr/> <p><b>Note:</b> The drive letter that is used will be that of your System Drive letter.</p> |
| <b>Step 4:<br/>install the<br/>Marc products</b>      | <p>You should decide where you want the products to be installed before running the <i>Setup</i> program on the DVD. The directory that you specify will be created during the installation process. The Marc product will by default be installed in <b>C:\MSC.Software\Marc\2008r1</b>. You may rename it if you like.</p> <p>This location is the installation path, and in the remainder of this document, the directory that you specify will be referred to as parent. The directories <code>marc2008r1</code> and <code>mentat2008r1</code> will be created in the location that you specify.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>setup type</b>                                     | <p>Select the product options that you wish to install. The Complete installation will be selected by default, which includes both Marc and Mentat.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>64-bit memory<br/>version</b>                      | <p>Select the memory version of the 64-bit solver that you wish to install.</p> <ul style="list-style-type: none"> <li>• Marc Solver 32-bit</li> <li>• Marc Solver 64-bit (Integer*4)</li> <li>• Marc Solver 64-bit (Integer*8)</li> </ul> <p>The Integer*8 version is the true 64-bit version and provides maximized memory capacity, however it requires more memory than the Integer*4 version for the same analysis. The Integer*4 version is limited to 8 GB per chunk of memory (element data, solver memory, etc.) and does not support DDM.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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| <b>specify license file</b>                 | <p>You will be prompted to specify the path to your license file. It will default to the current setting of <code>MSC_LICENSE_FILE</code>. If it is not set, then it will attempt to use the license file specified for <i>FLEXlm License Manager version 10.8.6</i>. If you do not already have your license file, you may leave it blank, however you <u>must</u> set the <code>MSC_LICENSE_FILE</code> variable before attempting to run any of the <i>Marc</i> products.</p> <hr/> <p><b>Note:</b> This is an <u>important</u> step. The installation will set the variable <code>MSC_LICENSE_FILE</code> to the setting that you enter. Failing to set it to a valid license file will result in a licensing failure and you will have to edit the environment variable setting by using the System applet in the Control Panel.</p> <hr/>                   |
| <b>file types</b>                           | <p>The installation will associate the file types <i>.mfd</i>, <i>.mud</i>, <i>t16</i>, <i>t19</i> and <i>.proc</i> to Mentat if they are not already associated. If they are, as it would be in the case that you have a previous Mentat installation, you will be asked if you wish to overwrite them.</p> <p>If you answer YES, then they are set to the current version and the <code>PATH</code> environment variable is updated with the current version specified first.</p> <p>If you answer NO, then they are not modified and the <code>PATH</code> environment variable is updated with the current version specified last.</p>                                                                                                                                                                                                                        |
| <b>install Acrobat Reader</b>               | <p>If you do not already have Adobe Acrobat Reader installed, you will be asked if you want to install Acrobat Reader 7.0 since this will provide you with access to the Marc and Mentat documentation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>complete the installation</b>            | <p>Select the <b>F</b>inish button in Setup.</p> <p>You may want to check the contents against the list supplied in <a href="#">Appendix A</a> of this document. Should any subdirectory be missing, please contact MSC.Software customer support for further details.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Step 5: starting the License Manager</b> | <p>You must start the <i>FLEXlm License Manager</i> before attempting to run Marc or Mentat. To start the license manager, use the Start menu and select Programs-&gt;MSC.Software-&gt;MSC.Licensing 10.8.6-&gt;FLEXlm Configuration Utility.</p> <p>Select the <i>Config Services</i> tab and verify that the settings are correct; i.e. the “License File” is set to the proper license file. Then start the license manager from the <i>Start/Stop/Reread</i> tab by pressing the <i>Start Server</i> button.</p> <hr/> <p><b>Note:</b> If you already had the FLEXlm License Manager 10.8.6 installed, you should not need to perform these steps.</p> <p>You should specify the options “Use NT Services” and “Start Server at Power-Up” under the <i>Config Services</i> tab. This will enable the license manager to start automatically at boot time.</p> |

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| <b>Step 6:<br/>checking</b> | <p>Verify that the setting for MSC_LICENSE_FILE is set properly by opening an MS-DOS Command Prompt window and typing:</p> <pre>set msc_license_file</pre> <p>The value will be displayed and it should be set to a valid license file.</p> <p>Correct the setting using the <i>System</i> applet in the <i>Control Panel</i> and selecting the <i>Advanced</i> tab and then the <i>Environment variables</i> button. It should be listed under the <i>System variables</i> section.</p> <p>Run Mentat by selecting the Mentat 2008 r1 icon on the desktop or by going to the Start menu on the taskbar and selecting the Programs-&gt; MSC.Software-&gt;Marc 2008r1-&gt;Mentat 2008r1 menu item. You may also start Mentat by typing <i>mentat</i> in a MS-DOS Command Prompt window.</p> <p>To check that Marc is working properly, run one of the standard Marc demonstration examples as proof of a successful installation. Open an MS-DOS Command Prompt window and <i>cd</i> to the <i>parent\marc2008r1</i> subdirectory <i>demo</i>. Run the e2x1 demo using the command:</p> <pre>run_marc -j e2x1</pre> <p>If all goes well, one of the final messages on the screen should read <b>Marc Exit number 3004</b>. If you have a FORTRAN compiler, choose a second demonstration example by running a user subroutine example using:</p> <pre>run_marc -j e2x4 -user u2x4</pre> <p>Again, Marc should give a <b>Marc Exit number 3004</b>.</p> <hr/> <p><b>Note:</b> Should any of these examples not run, please use the checklist in <a href="#">Appendix A</a> to verify whether the installation was executed correctly. Refer to <a href="#">Chapter 4</a> of this document for the syntax of <b>run_marc</b>. Contact MSC.Software customer support if you are still unable to run the examples.</p> <hr/> |
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## Chapter 4: Running Marc

This section describes the Marc usage on Microsoft Windows based machines. The Marc programs are mainly controlled by a batch script program called **run\_marc.bat** which is stored in the *parent* subdirectory `marc2008r1\tools`.

The batch script will submit a job and must be executed in the directory where all relevant input and output files concerning the job are available. To use the batch script, each Marc job should have a unique name qualifier and all Marc output files connected to that job will use this same qualifier.

Marc input files should always be named *job\_name.dat*, whereby the prefix *job\_name* is the name qualifier which you are free to choose. The suffix *.dat* is obligatory.

To actually submit a Marc job from an MS-DOS Command Prompt window, the following command should be used. The single input line is split over multiple lines for clarity:

|                 |             |                                                               |
|-----------------|-------------|---------------------------------------------------------------|
| <b>run_marc</b> | <b>-jid</b> | <b><i>job_name (required as minimum)</i></b>                  |
|                 | -rid        | <i>restart_name</i>                                           |
|                 | -pid        | <i>post_name</i>                                              |
|                 | -sid        | <i>substructure_name</i>                                      |
|                 | -prog       | <i>program_name</i>                                           |
|                 | -user       | <i>user_subroutine_name</i>                                   |
|                 | -save       | <i>save_user_executable</i>                                   |
|                 | -back       | <i>alternative for -queue</i>                                 |
|                 | -vf         | <i>viewfactor_name</i>                                        |
|                 | -def        | <i>defaults_name</i>                                          |
|                 | -nprocd     | <i>number_of_processors</i>                                   |
|                 | -nprocds    | <i>number_of_domains</i>                                      |
|                 | -dir        | <i>directory where job i/o takes place</i>                    |
|                 | -host       | <i>host_file</i>                                              |
|                 | -ci         | <i>copy input files to remote machines in a network</i>       |
|                 | -cr         | <i>copy post files back from remote machines in a network</i> |
|                 | -ml         | <i>memory limit in Mbytes</i>                                 |
|                 | -pc         | <i>computer_name</i>                                          |
|                 | -sdir       | <i>scratch file directory.</i>                                |

[Table 9](#) describes the meaning of these input options and [Table 10](#) gives examples.

Table 9 run\_marc Input Options

| Keyword         | Options                             | Description                                                                                                                                                        |
|-----------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -jid (-j)       | job_name                            | Job and input file name identification. Requires job_name.dat for all programs.                                                                                    |
| -prog (-pr)     | progname                            | Run saved executable progname.exe from a previous job.                                                                                                             |
| -user (-u)      | user_name                           | User subroutine user_name.f will be used to generate a new executable program called user_name.exe.                                                                |
| -save (-sa)     | <b>no</b><br><b>yes</b>             | Do <i>not</i> save the new executable program user_name.exe.<br>Save the executable program user_name.exe for a next time.                                         |
| -rid (-r)       | restart_name                        | For marc or progname: identification of previous job that created RESTART file.                                                                                    |
| -pid (-p)       | post_name                           | For marc or progname: identification of previous job that created postfile containing temperature data.<br>For plot: identification of job that created post file. |
| -sid (-si)      | substructure                        | Substructure jobs only: name of the substructuring file substructure.t31.                                                                                          |
| -back (-b)      | <b>yes</b><br><b>no</b>             | Alternative for -queue: run the program in the background.<br>Run the program in the foreground.                                                                   |
| -nprocd (-np)   | 3,4,etc.                            | Number of processors to be used for Domain Decomposition.                                                                                                          |
| -nprocds (-nps) | 2,3,4,etc.                          | Number of domains for parallel processing using a Single Input file.                                                                                               |
| -host (-ho)     | hostfile                            | Specify the name of the host file for running over a network (default is execution on one machine only).                                                           |
| -ci             | <b>yes</b><br><b>no</b>             | Automatically copy input files to remote machines in a network run.                                                                                                |
| -cr             | <b>yes</b><br><b>no</b>             | Automatically copy post files back from remote machines in a network run.                                                                                          |
| -vf             | vf_filename                         | Refers to the viewfactor file for a heat transfer radiation analysis.                                                                                              |
| -def            | defaults_file                       | Used to define an auxiliary input file containing default values.                                                                                                  |
| -ml             | <b>memory available on computer</b> | Upper bound to the amount of memory to be used.                                                                                                                    |
| -dir            | directory                           | Directory where the job i/o should take place. Defaults to current directory.                                                                                      |
| -pc             | computer_name                       | Remote computer name: defaults to local. Used for DCOM server support.                                                                                             |

\*Default options are shown in **bold**.

Table 9 run\_marc Input Options (continued)

|                                             |                |                                                                        |
|---------------------------------------------|----------------|------------------------------------------------------------------------|
| <b>-sdir</b>                                | directory_name | Directory where the scratch files are placed.<br>Defaults to -dir job. |
| *Default options are shown in <b>bold</b> . |                |                                                                        |

Table 10 Examples of Running Marc Jobs

| Examples of running Marc jobs                      | Description:                                                                                                                                                                                                                                |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>run_marc -jid e2x1</b>                          | Runs the job <i>e2x1</i> , the input file <i>e2x1.dat</i> resides in the current working directory.                                                                                                                                         |
| <b>run_marc -jid e2x14 -user u2x14 -save yes</b>   | Runs the job <i>e2x14</i> , using the user subroutine <i>u2x14.f</i> and the input file <i>e2x14.dat</i> . An executable program named <i>u2x14.dat</i> will be saved after completion of the job.                                          |
| <b>run_marc -jid e2x14a -prog u2x14</b>            | Runs the job <i>e2x14a</i> using the executable produced by job <i>e2x14</i> .                                                                                                                                                              |
| <b>run_marc -jid e3x2a</b>                         | Runs the job <i>e3x2a</i> .                                                                                                                                                                                                                 |
| <b>run_marc -jid e3x2b -rid e3x2a</b>              | Performs a restart job using the results of the previous job <i>e3x2a</i> .                                                                                                                                                                 |
| <b>run_marc -jid e2x1 -nprocd 2</b>                | Runs a two processor job on a single parallel machine.                                                                                                                                                                                      |
| <b>run_marc -jid e2x1 -nprocd 2 -host hostfile</b> | Runs a two-processor job over a network. The hosts are specified in the file <i>hostfile</i> (refer to the <a href="#">Marc Parallel Network for Microsoft Windows Installation and Operations Guide</a> for runs on a network of machines. |

## Chapter 5: Running Mentat

This section describes the Mentat usage on Microsoft Windows machines. The Mentat program is started by a batch script called **mentat.bat** which is stored in the *parent\mentat2008r1\bin* directory. It may also be started by using the Mentat 2008 r1 menu item in the START menu in the MSC.Software folder or by selecting the Mentat 2008 r1 icon that the *Setup* program created on your desktop.

You do not need to start the batch script from a specific directory.

The Mentat program creates the default files in your current working directory; i.e. where you are located at the time of starting the Mentat program (if run from the command line), or the “Start in” directory specified for the shortcut if started from the Mentat 2008 r1 icon.

The batch script **mentat.bat** contains a number of arguments which are passed on to the Mentat program. [Table 11](#) gives the meaning of these input options. You are free to alter these commands to suit your preference.

Table 11 Mentat Input Options

| Keyword         | Option               | Description                                                                                                                                                                                                                      |
|-----------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>-ar</b>      | area_ratio           | This is similar to -sz, except it is a percentage of the default window size.                                                                                                                                                    |
| <b>-bp</b>      | \$ (DIR) /bin/       | Directory path name where the external Mentat programs and shell scripts are located.                                                                                                                                            |
| <b>-compile</b> | binary_menu_filename | This is used to compile ASCII menu files into a Binary menu file.                                                                                                                                                                |
| <b>-db</b>      | True/False           | Double buffering: a screen refresh is first assembled in a separate memory section and then displayed. This option results in a smooth appearance. The default is <i>True</i> or <i>On</i> .                                     |
| <b>-fn</b>      | 8x15                 | Default font type.                                                                                                                                                                                                               |
| <b>-gr</b>      |                      | This uses the gray scale color map.                                                                                                                                                                                              |
| <b>-ha</b>      | True/False           | This option enables the middle mouse button help windows to run the Adobe Acrobat reader using the PDF help files. <i>True</i> turns on using the PDF help, <i>false</i> turns it off. The default is <i>True</i> or <i>On</i> . |
| <b>-help</b>    |                      | All of the options.                                                                                                                                                                                                              |
| <b>-hp</b>      | \$ (DIR) /help/      | Directory path name where the help files are located.                                                                                                                                                                            |
| <b>-lf</b>      | filename             | Specify the Mentat logfile name.                                                                                                                                                                                                 |
| <b>-mf</b>      | main.ms              | The name of the startup menu file.                                                                                                                                                                                               |
| <b>-ml</b>      | \$ (DIR) /material/  | Directory path name where the material files are located.                                                                                                                                                                        |
| <b>-mp</b>      | \$ (DIR) /menus/     | Directory path name where the menu files are located.                                                                                                                                                                            |
| <b>-nh</b>      |                      | Not provided by default. For OpenGL versions of Mentat. The use of this switch reduces run time memory requirements at the expense of graphic speed.                                                                             |

Table 11 Mentat Input Options (continued)

| Keyword      | Option           | Description                                                                                                                                                                          |
|--------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>-path</b> | directory_name   | Provides a directory in which Mentat searches when opening an existing input file. Multiple directories can be specified as follows: <i>-path directory_1 -path directory_2</i> etc. |
| <b>-pr</b>   | <i>filename</i>  | Any additional set-up commands you wish to add. Store these in a procedure file containing the Mentat commands.                                                                      |
| <b>-ra</b>   |                  | This reads all of the ASCII Menu files.                                                                                                                                              |
| <b>-rf</b>   | <i>filename</i>  | Record the Mentat commands in the procedure file <i>filename</i> .                                                                                                                   |
| <b>-ss</b>   | True/False       | Graphic refresh to use snapshots. The default is <i>True</i> .                                                                                                                       |
| <b>-sz</b>   | width height     | Change the size (width and height in pixels) of the window.                                                                                                                          |
| <b>-ti</b>   | title            | Append <i>title</i> to the name of the window.                                                                                                                                       |
| <b>-xr</b>   | horizontal_ratio | This is similar to <i>-sz</i> , except it is a percentage of the default window size in the horizontal direction.                                                                    |
| <b>-yr</b>   | vertical_ratio   | This is similar to <i>-sz</i> , except it is a percentage of the default window size in the vertical direction.                                                                      |

## Chapter 6: Mentat Interfaces

### Mentat External Programs

Mentat supports a number of CAD interfaces: IGES, Patran, Ideas, VDA. These interfaces are programmed in external programs which are called from within Mentat. The interface programs are stored in the *parent* subdirectory `mentat2008r1\bin`. These programs read the data files in their native format and translate the contents into a Mentat model file. This file is subsequently read by Mentat. The external programs are called from within Mentat by means of the `FILE` submenu.

### Jobs

The subdirectory `bin` contains batch script files to start a Marc job using the following batch scripts:

**submit1.bat, submit2.bat, submit3.bat**

These batch scripts are called by means of the buttons in the *job* menu. You may alter these files to suit your environment.

### Plotter Interface

Because of the many variations in plotting environments, we have created plotting interfaces in the form of batch scripts that operate from within Mentat. Currently, Mentat recognizes the following plotting formats:

- PostScript
- WinDump (translated into Windows bitmap (.BMP) format)

This section describes a template batch script for each of the formats mentioned above. They are located in the `mentat2008r1\bin` directory and are named as follows:

**pscolor1.bat, pscolor2.bat, pscolor3.bat**  
**psgray1.bat, psgray2.bat, psgray3.bat**  
**xdump1.bat, xdump2.bat, xdump3.bat**

### PostScript

The PostScript function is activated by pressing the Gray or Color Print button from the UTILS menu on the POSTSCRIPT panel. The program captures the graphics portion of the screen into a file and sends this file to a PostScript printer using the `psgray` or `pscolor` batch scripts located in the `mentat2008 r1\bin` directory. In the example listed below, the file is sent to the printer `LPT1`. This can be a printer attached locally, or located somewhere on the network. After the file is sent, it is removed from disk automatically.

```
print /D:LPT1: %1
del %1
```

The argument `%1` is the filename handed to the batch script by Mentat. If there is more than one printer on-line, the **pscolor2.bat** and **pscolor3.bat** batch scripts may be used to address these other printers.

You can use the `setup_printer` program to configure a network printer. Run `setup_printer` for more details.

## Edit

The **`edit_window.bat`** batch script is used to control the editor associated with the EDIT commands. It is possible to change the type of editor, for example, from notepad to emacs.

## System Shell

The **`system_window.bat`** batch script is used to control the type of window opened with the `system_shell` command.

## AVI Playback

The **`avi_window.bat`** batch script is used to control the program opened with the `play_avi` command.

## MPEG Playback

The **`mpeg_window.bat`** batch script is used to control the program opened with the `play_mpeg` command.

# Chapter 7: Managing FLEXIm

## FLEXIm License File

FLEXIm is the network based licensing product from Macrovision used in MSC products.

The license file, license.dat, should be placed in the c:\msc.software\msc.licensing\10.8.6 directory once you receive your licenses from your nearest MSC.Software office. Everyone should have read permission to the file. The license file has the following format:

| Line       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SERVER     | This line specifies the license server. It has the format:<br><br>SERVER hostname hostid port                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| DAEMON     | This line specifies the name of the vendor daemon (marcd), and the path. It has the format:<br><br>DAEMON MSC c:\msc.software.msc.licensing\10.8.6\MSC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| FEATURE    | This line lists the feature, or license names. This line <u>cannot</u> be modified from what is sent to you. For your Marc license, it has the format:<br><br>FEATURE MARC MSC 2010.1231 (for single processor version)<br>FEATURE MARC_Parallel MSC 2010.1231 (for parallel version)<br><br>For your Mentat license, it has the format:<br><br>FEATURE MENTAT MSC 2010.1231<br><br>Each single-processor job is required to have a license name MARC for execution to proceed. To run a multiprocessor job, a corresponding number of multiple licenses with the feature name MARC_Parallel plus a license name MARC is required. For example, to run a job using four processors in parallel, one MARC license and four MARC_Parallel licenses are needed. |
| USE_SERVER | When used together with the SERVER line, this line is used on the licensed “client system” (as opposed to the license server), to specify that it should obtain a license from the specified license server. It has no options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| CAMPUS     | This line specifies that a pool of license tokens are used. When the MasterKey licensing system is used, the FEATURE line will have a specification for VENDOR_STRING containing GROUP: CAMPUS and BLV: nn, where nn is the number of tokens that is required in order to obtain a license. All MSC.Software products may obtain a license from a MasterKey license provided that a corresponding FEATURE line exists.                                                                                                                                                                                                                                                                                                                                       |

## FLEXIm License Manager

When you install Marc or Mentat, the FLEXIm License Manager is installed in the *msc.licensing\10.8.6* directory. Once **lmgrd.exe** is running, it will read the license file license.dat which is located in the *msc.licensing\10.8.6* directory. The license file contains the Marc and Mentat license (and other



MSC.Software product licenses, if necessary). In addition, **lmgrd.exe** will also start the MSC.Software vendor daemon **MSC.exe**. The path to **MSC.exe** is specified in the license file on the DAEMON line. These processes must be running on the license server for the MSC.Software security system to obtain a license. The only exception to this is for a “zero count” license. If the number of licenses for a feature (the number following the expiration date) is 0, then neither **lmgrd.exe** or **MSC.exe** are used. The license manager is only used to keep track of licenses that are checked in/out.

Marc contacts these daemons at regular intervals. If no contact is made after a specified time period, Marc terminates execution.

For the 2008 r1 version, the FLEXlm License Manager must be at version 10.8.6 or higher.

When you select the MSC.Licensing product, they will be upgraded to version 10.8.6. You should stop the FLEXlm License Manager before installing the product so that the programs can be updated (this is done automatically on Microsoft Windows). If your license server is a remote machine, then you need to update the FLEXlm programs on the server before attempting to run the product. If you do not have a CD-ROM for that platform, the programs may be downloaded from:

```
ftp://ftp.mscsoftware.com/pub/msc-products/system_util/flexlm/v10.8.6
```

There is a *readme* file which will tell you which zip file to download, and an *install* file which will provide instructions for installing the programs.

## Environment Variables

The environment variable **MSC\_LICENSE\_FILE** is used to specify the *license.dat* file. This environment variable can be set using the System applet in the Control Panel, and is a semicolon separated list of file pathnames or hosts. The default setting will be `c:\msc.software\msc.licensing\10.8.6\license.dat`. When Marc executes, it checks the list of license files specified by this environment variable. You may have it point to a license server using the syntax `port@host`, as follows:

Variable: **MSC\_LICENSE\_FILE**

Value: 10620@myserver

If you have other products that use FLEXlm and they are required to be available when Marc is running (such as a FORTRAN compiler license), then you should modify the **MSC\_LICENSE\_FILE** setting to point to the proper license file for that product.

You may instead want to combine the licenses into one file.

## Security Directory

The security directory must be writable by all Marc users since **lmgrd.exe** will write the logfile (*flexlm.log*) to that directory. If you do not wish to have the security directory writable by others, then you must update this location by starting the FLEXlm applet located in the Start menu. You may also want to monitor the size of the logfile, since all FLEXlm activity is recorded.

---

**Note:** The *flexlm.log* file contains important status information regarding the license manager daemon. Always check this file when you get a security error.

---

If you move the security directory to a different location, or more specifically if you move your `license.dat` file, then you *must* modify the `MSC_LICENSE_FILE` environment variable to specify the new path.

## Combining the Marc License with Other MSC Products

You can combine the Marc license with other MSC product licenses. To do this, add the Marc license to the license file for MSC.Nastran, MSC.Patran, or other MSC products. Then make sure that the `MSC_LICENSE_FILE` environment variable is set to the new location.

## Client/Server Licensing

The default installation assumes that the system in which Marc is installed will function as the *license server*. The term *license server* only refers to the fact that *lmgrd* and *MSC* will be running on that system, and will maintain the state of available licenses. Even if you have purchased a nodelocked license, the nodelocked system will function as the license server for that license. A nodelocked license can be distinguished from a floating license by the string `HOSTID=xxx` specified in the feature line.

If you have purchased a floating license, the system that is to be the license server must be determined before generating the system identification file (*sid001.dat*). You *must* generate the system identification file from the license server, since the `lmhostid` value of the server is needed to generate your passwords. The license file that is returned to you should be placed in the security directory. The client systems can use the same license file, or they can use a brief license file with just the `SERVER` and `USE_SERVER` lines.

## MasterKey Licensing

The MasterKey licensing option allows you to use a pool of licenses for all of the MSC.Software products. A MasterKey license is issued with a pool of “tokens”. Each MSC.Software product will attempt to retrieve a specified number of these tokens in order to be granted a license. If not enough tokens are available, then it will be queued. Programs that are queued will be granted a license in the order which they request a license. For example, if there are 100 tokens and a request is made for 60 tokens, that program will be granted a license. If another program makes a request for 60 tokens, it will be placed in the license queue. If yet another program makes a request for 40 tokens, it will be queued behind the requested 60 tokens. When the program that was using the 60 tokens exits and releases its tokens, the queued request for 60 tokens will then be granted a license. Then the queued request for 40 tokens will be granted a license.

The amount of minutes a program will wait for a license after it has been queued may be specified with the environment variable `MSC_AUTHQUE`. The default value is 5 minutes. It may be set as follows in a command prompt:

```
set MSC_AUTHQUE=20
```

## Chapter 8: Configuring the Marc DCOM Server

### Specifying the Logon User

The Marc DCOM Server allows you to run jobs on a remote Microsoft Windows machine without actually being logged into it. Unlike Marc Parallel, it will only run a single CPU job.

When you install Marc, the installation will initially setup the Marc DCOM Server. The server must be setup on both the client and the server machine. The user must specify a login user for the Marc DCOM Server using `Dcomcnfg` before attempting to run a job remotely.

To run `Dcomcnfg`, open up a console window and type `dcomcnfg` at the prompt, or select the Start->Run... menu and enter `dcomcnfg` and press OK. It will appear as shown in [Figure 2](#).

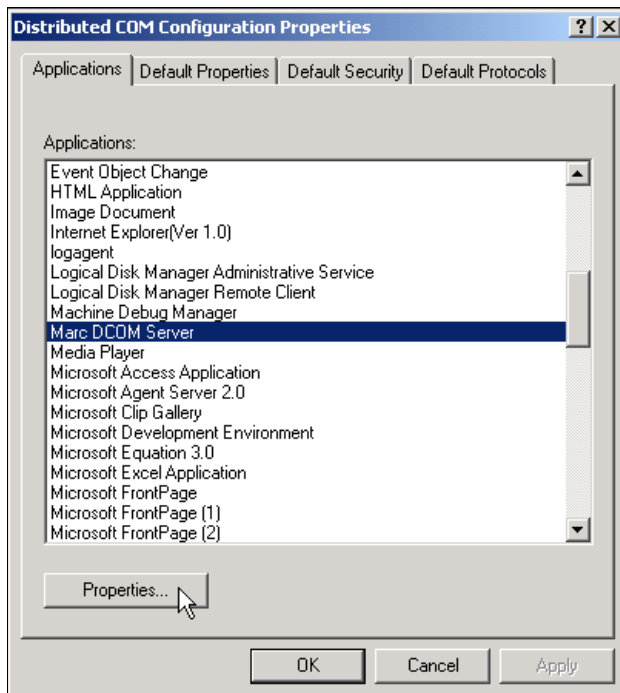


Figure 2 Dcomcnfg Displaying Marc DCOM Server

On Windows XP, a different interface appears. Select the *Component Services/Computers/My Computer/DCOM Config* option, and scroll down to the Marc DCOM Server item. Right click it and select *Properties*.

Select the *Properties* button for the Marc DCOM Server. A new window will appear showing the various properties. This is shown in [Figure 3](#).

The only property that needs adjusting is the *Identity* property. Select the Identity tab. `Dcomcnfg` will then display the identity view as shown in [Figure 4](#).

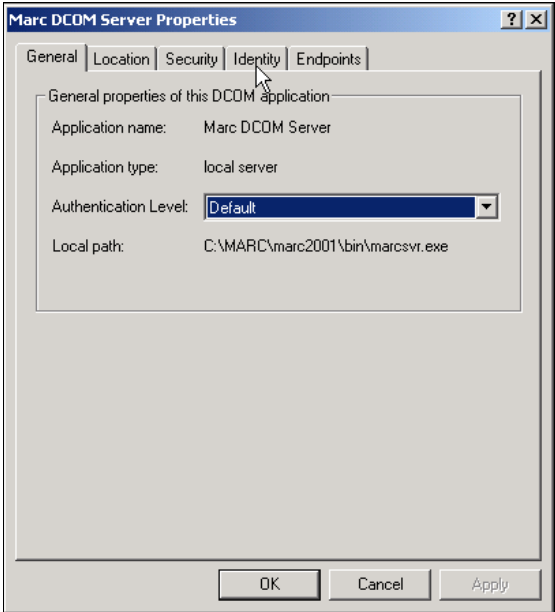


Figure 3 Dcomcnfg Displaying the Properties of the Marc DCOM Server

In the Identity view, select *This user*, and specify a user that has access rights to this machine. Select *Apply*, and then *OK* to close the window. Then select *OK* in the main view.

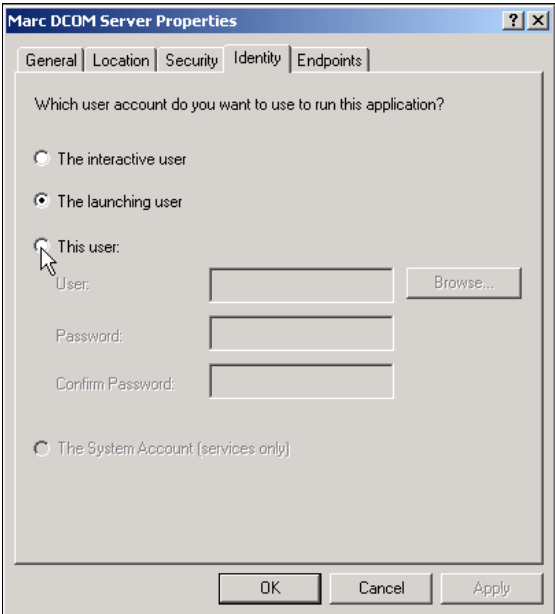


Figure 4 Dcomcnfg Displaying the Identity Properties of the Marc DCOM Server

The data files must be located in a shared directory. This is required so that the two machines can access the files. If the file is not located in a shared directory, Marc will issue an error message specifying that the file is not located in a shared directory. To share a disk or a directory, select *My Computer* from the desktop and select the disk or browse to the directory. Then select the disk or the directory by using the right mouse button, and select *Sharing*. In the Sharing view, select the *Share this folder* button and enter a name for the share.

## Testing the installation

You should first test the Marc DCOM Server on the server machine, and then test it on a client machine. First, copy a Marc data file to a shared directory. The file must be in a shared directory even if the job is to be run locally using the Marc DCOM Server. The data file `parent\marc2008r1\demo\e2x1.dat` will suffice. Run the job from any command prompt window using the `-pc` option:

```
<parent>\marc2008r1\tools\run_marc -pc <servername> -j e2x1
```

If it succeeds, then perform the same test on a client machine. If a failure occurs, see the section on the following page on *Troubleshooting*. Again, make sure the data file resides in a shared directory. When running the job, you may also use the UNC name in the path. If it is not specified, Marc will determine the UNC path and send it to the server.

## Mentat Support

Running the job remotely may also be done within Mentat, however the menu is not display by default. You must first rebuild the menu file using:

```
cd <parent>\mentat2008r1  
bin\mentat -compile menus\main.msb -df DCOM
```

In the JOBS-> RUN->ADVANCED JOB SUBMISSION menu, there is a button named DCOM as show in [Figure 5](#). Select the DCOM button and in the adjacent text area specify the name of the remote machine. Note that when you submit the job, you will NOT be able to do a `monitor_job` (MONITOR in the JOBS->RUN menu) because the standard output from Marc is not redirected to the log file. However, you will be able to do a `post_monitor` (MONITOR in the RESULTS menu).

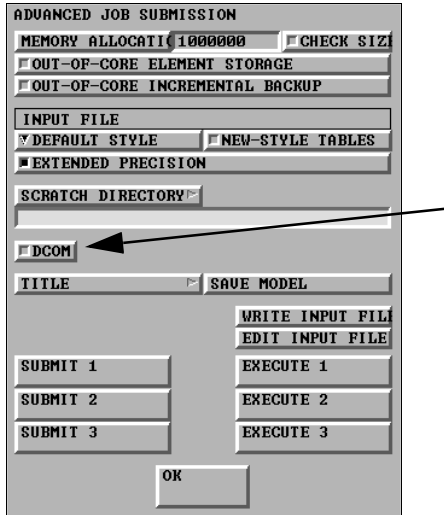


Figure 5 JOB RUN Menu Displaying the DCOM Button

## Troubleshooting

In the case of an error, try some of the following suggestions:

- Check that your user ID is valid on both the server and the client machines.
- Check that the user ID has read and write access to the directory where the job is to be run.
- Check that the directory that the data file resides in is a shared directory. Note that for Windows 2003 Server, you must also specify the user permissions using the `/GRANT` option for the `net share` command or by clicking the Permissions button under the Sharing tab in Explorer.
- Run the `run_marc` script using the `-it` option to print out debugging information. This will print out exactly what is being sent to the server:
 

```
<parent>\marc2008r1\tools\run_marc -pc <servername> -j e2x1 -it 0
```

 The pathnames displayed from the debug output should be displayed as a proper UNC name. If not, verify that the directory is shared.
- Start the Marc DCOM Server manually and connect to it. To do this, `cd` to the `marc2008r1\bin` directory and run the program `marcsvr.exe`. You may also supply the `-it` option to obtain what the server has received. Then open up another command prompt window and run the job. In the `marcsvr.exe` window, you should see the log file output from the job.

## Appendix A: Marc Subdirectories

The Marc version you have received contains a full set of subdirectories listed below. You can save disk space by removing the subsets that you do not need.

Table 12 Contents of the Marc Distribution DVD

| <b>Basic set:</b>            | <b>Contents: required as minimum</b>                                                                                                       |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>bin</b>                   | executable Marc programs                                                                                                                   |
| <b>tools</b>                 | batch scripts to run and maintain the Marc programs                                                                                        |
| <b>AF_flowmat</b>            | material data for database                                                                                                                 |
| <b>doc</b>                   | Installation Guide, Release Guide, and Marc Volumes A-E installed in this directory if Mentat is not installed                             |
| <b>Extended set:</b>         | <b>Contents: only for use with user subroutines</b>                                                                                        |
| <b>lib</b>                   | binary libraries with the compiled Marc routines                                                                                           |
| <b>common</b>                | insert files containing Marc common blocks                                                                                                 |
| <b>user</b>                  | templates for all available Marc user subroutines                                                                                          |
| <b>Examples:</b>             | <b>Contents: example files</b>                                                                                                             |
| <b>demo</b>                  | input files and user subroutines for the Marc Volume E: Demonstration Problems                                                             |
| <b>demo_ddm</b>              | input files and user subroutines for the single parallel machine as well as the network parallel version of Marc                           |
| <b>demo_table</b>            | input files and user subroutines for Marc Volume E: Demonstration Problems based upon Table driven input format                            |
| <b>benchmark</b>             | small set of demonstration examples for performance measurement                                                                            |
| <b>test_ddm</b>              | one, two, and four processor test examples for installation testing of the single parallel machine as well as the network parallel version |
| <b>Utilities:</b>            | <b>Contents:</b>                                                                                                                           |
| <b>pldump</b>                | source routines for the post-file conversion program pldump                                                                                |
| <b>pldump2000</b>            | source routines for the post-file conversion program pldump2000                                                                            |
| <b>intel_mpi,<br/>ms_mpi</b> | MPI libraries for network parallel version                                                                                                 |

## Appendix B: Mentat Files and Subdirectories

The Mentat version you have received contains a full set of subdirectories listed below. You can save disk space by removing the subsets that you do not need.

Table 13 Contents of the Mentat Directory Unloaded from DVD

| Basic set:    | Contents: required as minimum                           |
|---------------|---------------------------------------------------------|
| bin           | batch scripts and programs for Mentat                   |
| help          | Mentat online help files                                |
| materials     | Mentat material files                                   |
| menus         | Mentat menu files                                       |
| doc           | Installation Guide, Release Guide, and Marc Volumes A-E |
| Extended set: | Contents: example Mentat procedure files                |
| examples      | sample Mentat procedure files                           |

Table 14 Contents of the Security directory unloaded from DVD

| Program                                                    | Description                                                                 |
|------------------------------------------------------------|-----------------------------------------------------------------------------|
| lmutil.exe                                                 | the Flexlm utility program                                                  |
| lmgrd.exe                                                  | FLEXlm license manager                                                      |
| MSC.exe                                                    | the vendor daemon used to pass Marc specific licensing information to lmgrd |
| See the <i>FLEXlm End User Manual</i> for more information |                                                                             |



## Appendix C: Troubleshooting

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Access is denied</b>                | <p>This type of problem is caused by not having write permissions to the file or directories to which you are installing.</p> <p>To correct this problem, open up an MS-DOS Command Prompt window, <code>cd</code> to the directory in which you are installing Marc, and run the <b>attrib</b> program to remove the read-only attributes (with the <code>-R</code> option).</p> <p>You may also use the File Manager's <b>Security</b> menu to change <i>Ownership</i> of files and directories, and to change <i>Permissions</i> on them.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Error during move process</b>       | <p>This problem is caused by having an application or a file open during the installation process that the installation is trying to overwrite. Exit all applications and documents during installation and restart the installation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Security failed or Marc exit 67</b> | <ul style="list-style-type: none"> <li>• The environment settings are not set properly. If you have not already logged out and logged back in again, do so now and try again. Check that the environment variable <code>MSC_LICENSE_FILE</code> is set to a valid license file. If you have not installed your passwords yet, then you must do so before security will succeed.</li> <li>• Check that the FLEXlm license manager has been started from the FLEXlm Configuration Utility applet in the Start menu under MSC.Software-&gt;MSC.Licensing 10.8.6. This must be done AFTER you have saved your <b>license.dat</b> file in the <code>msc.software\msc.licensing\10.8.6</code> directory. Test that it is working by pressing the Status button in the Control menu.</li> <li>• You are attempting to run on a machine that according to the Marc password(s) you are not allowed to use.</li> <li>• Your license period has expired. Check the date on your machine.</li> <li>• Cannot access or read the file <b>license.dat</b> in the <code>msc.software\msc.licensing\10.8.6</code> subdirectory.</li> <li>• Every Marc user should have read and write rights for the <i>parent</i> subdirectory <code>10.8.6</code>.</li> </ul> |
| <b>License Manager will not start</b>  | <ul style="list-style-type: none"> <li>• If the license manager won't start, check that the hostname on the SERVER line is correct. Also check that the DAEMON line contains the correct path to the license daemon <b>MSC.exe</b>.</li> <li>• If you had an older version of the FLEXlm license manager installed, the new installation may replace it. If the Use NT Services button was previously checked, you should uncheck this button, start the license manager, and then select the Use NT Services button.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Link failed**

- Your user subroutine causes compiler errors.
- You have no Fortran compiler or Fortran libraries not available.
- Your PATH or LIB environment variables settings do not point to the proper location for your Fortran compiler.

**FORTTRAN files are not being compiled**

- The FORTRAN compiler is not in your search path, or the INCLUDE and LIB environment variables are not set. You can verify that your settings are correct with the **set** command. If you selected the default installation path, you should run the C:\Program Files\Intel\Compiler\Fortran\9.1\IA32\Bin\ifortvars.bat script (or substitute your installation directory). These items can be set from the System applet located in the Control Panel.
- The Intel Fortran compiler requires that the Microsoft .NET 2005 framework is installed and the LIB environment variable setting includes the required dependency libraries. The setting must include the following:

C:\Program Files\Microsoft Visual Studio 8\VC\LIB  
 C:\Program Files\Microsoft Visual Studio 8\VC\PlatformSDK\Lib  
 C:\Program Files\Intel\Compiler\Fortran\9.1\IA32\Lib

The following paths must also be included in the PATH environment variable to locate the linker and required runtime libraries:

C:\Program Files\Microsoft Visual Studio 8\VC\Bin

**User subroutines are not being called**

- With FORTRAN, the argument list for subroutines must match exactly. If the argument does not match exactly, your subroutine will not replace the existing subroutine in the Marc Library. The linker will continue to use the subroutine that is defined in the Marc Library, and since your routine will not be linked in, it will never be called.

# Marc Parallel Network for Microsoft Windows Installation and Operations Guide

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# Introduction

The current document is divided into three parts:

- Part I

provides the general description about the hardware and software requirements and definitions.
- Part II

provides a step-by-step approach to installation of the network version.
- Part III

provides miscellaneous information about executing a parallel job over a network and use of user subroutines.

The list of supported capabilities in parallel can be found in Section 7 of the Release Guide.

## Part 1 General Information

### Hardware and Software Requirements:

For 32-bit Windows platforms the Intel MPI 3.1 is supported.

To use the MPICH2 please observe the following:

Go into the intel\_mpi\bin directory and type

```
wmpiregister.exe
```

Enter your account and password in the popup dialog box and press the “Register” button.

The message “Password encrypted into the Registry” will show in at the bottom of the dialog box.

If you change your account and password you will need to repeat this step.

Press the “OK” button to continue.

For 64-bit Windows platforms the supported MPI versions are the Intel MPI 3.1 (default) and the Microsoft MS/MPI using the Microsoft CCS utilities.

To switch from the default Intel/MPI to MS/MPI, perform the following tasks:

- a. Go to the marc2008r1\bin directory and type

```
copy marc.exe_msmpi marc.exe
```

- b. Go to the marc2008r1\lib directory and type

```
copy mdsrc.lib_msmpi mdsrc.lib
```

- c. Go to the marc2008r1\tools directory and edit (using "write") the include.bat file.

change

```
set MPITYPE=intel-mpi
```

```
rem set MPITYPE=ms-mpi
```

to

```
rem set MPITYPE=intel-mpi
```

```
set MPITYPE=ms-mpi
```

All the required components as listed in the include.bat file in the marc tools directory need to be installed. Microsoft CCS SP1 (676 build) or above is required to run DMP.

In particular, as shown in the include file, the following is needed to run parallel jobs.

C:\Program Files\Microsoft Compute Cluster Pack\bin\mpiexec.exe

The mpiexec.exe and msmpi.dll are included in the Microsoft Compute Cluster Pack or CCP, a separate CD from the operating system. If the files do not exist in your system, go to <http://www.microsoft.com/hpc> and get information on how to download or order CDs (there is a link on the left called "How to Buy.")

Please turn off the Windows firewall in your cluster and shared the marc directory with a general permission to all users.

The host file for using the MS/MPI has a slightly different format than that for the Intel/MPI. A "headnode" field is added where the "headnode" is the UNC name of the node where the Microsoft Job Scheduler is installed.

```
host1    n1    workdir1    installdir1    headnode
host2    n2    workdir2
host3    n3    workdir3
```

For both "workdir" and "installdir", use the UNC directory names as echoed by typing "net share" on your system.

For example,

```
venus      2    \\venus\test1 \\venus\marc2008r1 \\earth
mars       2    \\mars\test2
```

The DMP job will be run using 2 processors on node venus in the shared directory test1 and 2 processors on node mars in the shared directory test2 and the Microsoft Job Scheduler is installed in the head node earth.

Note that the version of MS/MPI used to run the marc job requires that all processors within your cluster be allocated (done automatically by the run\_marc.bat script) even for running a job that requires less than the total number of processors in the system.

Although no specific hardware requirements exist to run a job in parallel, it is preferable that for distributed parallel processing to have fast network connections between the machines. It is recommended that the network should have a speed of at least 100 MBit per second. If only two machines are to be used, a hub or a cross-over cable can be used to connect them. If more than two machines are to be used, a switch is preferable. TCP/IP is used for communications. Refer to the include.bat file in the tools directory for requirements on O/S, compilers, etc. for more details regarding running on Microsoft Windows.

## Definitions

1. Root machine:

The machine on which the Marc job is started.

2. Remote machine:

Any machine other than the root machine which is part of a distributed Marc run on the network.

3. Shared installation:

Marc is installed in a UNC shared directory on one machine only. Other machines can access the Marc executable since the directory is shared.

4. Distributed installation:

Marc is installed on all machines. Each machine accesses its own Marc executable.

5. Distributed execution:

Marc is run on multiple machines which are connected with a network. Each machine loads the Marc executable either from a shared or a local directory and then executes the executable.

6. Shared I/O:

Marc reads and writes data in a UNC shared directory. Each Marc executable running on the network reads/writes to the same directory.

7. Distributed I/O:

Marc reads and writes data in a directory located on each machine. Transfer of data files and post files between the root machine and remote machines is done automatically by Marc.

8. UNC – Uniform Naming Convention.

## Network Configuration

Marc only needs to be installed on the root machine where the installation directory is UNC shared (shared installation). Marc can also be installed on the remote machines which then use their own executable (distributed installation). The root machine is the one on which the Marc job is started, typically from within Mentat. The remote machines can be located anywhere as long as they are connected to the network. The working directory on each machine can be a shared directory on any machine on the network (shared I/O) or it can be a local directory on the hard disk of each machine in the analysis (distributed I/O). The User Notes describes how to specify what working directory to use.

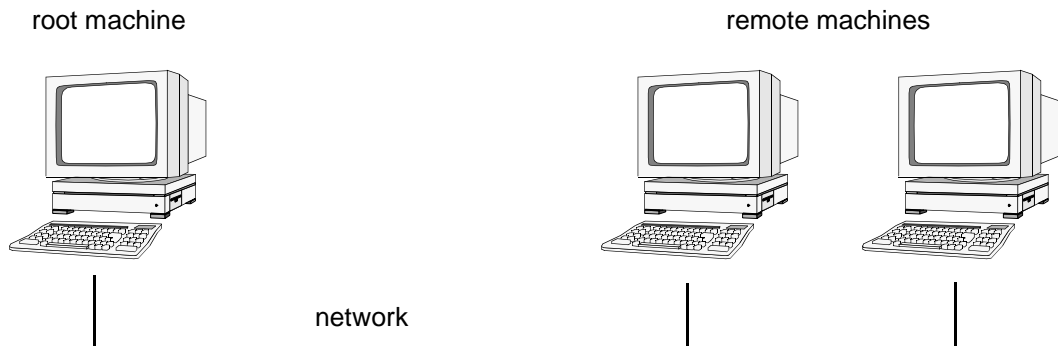


Figure 6 Network Configuration

## Part 2 Installation Notes

This part describes the specific steps needed to install and set up a network version of Marc. For general information on Marc installation, see [Marc and Mentat for Microsoft Windows Installation and Operations Guide](#).

**Steps 1–6:** Must be performed as Administrator.

**Step 1:** Install Marc on the root machine.

**Step 2:** Make sure that the installation directory on the root machine is properly shared, so that the remote machines can access it. Assuming that Marc is installed under `c:\MSC`, share this directory by associating a UNC sharename with it as follows. Use My Computer and locate the directory to be shared. Right click on the directory and choose Sharing, Choose Share As and give it a Share Name (this is the UNC name) and click OK.

Please note that Marc restricts the UNC name to have a maximum of 10 characters and the name of the shared directory to have a maximum of 30 characters. If necessary, a directory higher up in the path can be shared (for instance, `c:\` instead of `c:\MSC`). It is sufficient that either `c:\` or `c:\MSC` is shared.

**Step 3:** On the remote machines you can choose between a full Marc installation and an installation of the MPICH2 Process Manager service only. In the latter case, the remote machine will be using the Marc installation of the root machine via the UNC sharename.

The Process Manager service must be installed and running on all hosts involved a distributed job across the network. To install the Process Manager on a machine without a full Marc installation, copy the `smpd.exe` program from the `mpich2\bin` directory (on the root machine) to a local directory on the remote machine. Open a Command Prompt window on the remote machine, go into that directory and execute:

```
.\smpd -install
```

**Step 4:** Create a Marc file with the shared naming information. From the Command Prompt, change directory to the `tools` directory in the Marc installation directory (here assumed to be `c:\MSC`).

```
c:
cd \MSC\marc2008r1\tools
net share > marc.net
```

This file has to be recreated each time the shared name of the installation directory is changed. The file `marc.net` contains the connection between the path names on the root machine and the UNC names, and can be created only by the Administrator. If this file does not exist or contains outdated information, the remote machines will not be able to find the executable on the root machine.

**Step 5:** Test the Marc installation for single processor execution by typing from the root machine:

```
c:
cd \MSC\marc2008r1\test_ddm\exmpl2\exmpl2_1
run_marc -j cyl2
```

and Marc should exit in about three minutes if it is a successful run.



**Step 6:** Test the Marc installation for multi-processor, distributed execution. Assume the host name of the root machine is host1 and one of the remote machine is host2. Type from host1:

```
c:
cd \MSC\marc2008r1\test_ddm\exmpl2\exmpl2_2
```

and edit the file `hostfile` in this directory by replacing `workdir` with

```
c:\MSC\marc2008r1\test_ddm\exmpl2\exmpl2_2
```

The host names and directory names should be replaced with the names on the current system. Finally, type:

```
run_marc -j cyl2 -nproc 2 -host hostfile
```

and Marc should exit in about two minutes if it is a successful parallel run on host1 and host2 using one processor on each. If the job stalls or hangs at start-up time, exit it by typing `control-C` in the window in which it was started. See [Part 3 User Notes](#) in this section.

## Part 3 User Notes

This section assumes that the network version of Marc, including MP-MPICH, has been successfully installed on two machines that are to be used in a distributed analysis and that the appropriate Marc licenses are in order. Assume that `host1` is the host name of the machine on which Mentat is running and from which the job is to be started (the root machine). The host name of the other machine (the remote machine) is `host2`.

### How to run a network job

First make sure that the two machines are properly connected. From `host1`, access `host2` with Network Neighborhood. If this is not possible, a network run will not be possible. See [Part 3 User Notes](#) in this case.

In order to perform an analysis over a network, a special file called a *host file* needs to be created by the user. This file defines which machines are to be used, how many processes are to run on each, what working directory should be used, and where the Marc executable can be found on each machine. The host file can be selected and edited in Mentat and the Marc job started as usual from within Mentat (see the example below). If Marc is run from the command line, it is done as for a normal run using an additional command line option. For example:

```
run_marc -b no -jid test -nproc 2 -host hostfile1
```

will run the two-processor job `test.dat` using the specification in the file `hostfile1`. No specific name or extension is used for the host file except that the name *jobid.host* (in this example `test.host`) must be avoided since it is used internally by Marc.

### Specification of the host file

The host file has the following general format:

```
host1 n1
host2 n2 workdir2
host3 n3 workdir3
```

Each line must start at column 1 (no initial blanks). Blank lines and lines beginning with a `#` (number symbol) are ignored.

The first entry is the host name of a machine to be used in the analysis. The root machine must be listed first and each machine must only occur once.

The second entry specifies the number of processes to run on the machine specified in the first entry. The sum of the number of processes given in the host file must equal the number of domains used. In a five-domain job, it is required that  $n1+n2+n3=5$ .

The third entry specifies the working directory to use on this host. This is where the I/O for this host takes place. The Marc input files for this machine must be in this directory and the results files for this machine are created in this directory.

The different domains of the Marc job are associated with the different machines as follows. Suppose a five-domain job `test` is run using a host file defined as

```
host1 2
host2 1 workdir2
host3 2 workdir3
```

with appropriate definitions of the third entry, see below. There will be six Marc input files associated with this job: `test.dat`, `1test.dat`, ..., `5test.dat`. Domains 1 and 2 will be associated with `host1`, domain 3 with `host2` and domains 4 and 5 with `host3`.

## Shared I/O

Suppose a job is to be run on `host1` and `host2`. A shared directory on `host1` is to be used for I/O. The UNC sharename for this directory is assumed to be `dir7`. The host file for a two-processor job would simply be

```
host1 1
host2 1 \\host1\dir7
```

To verify the work directory given, enter Network Neighborhood from `host2` and click through `host1->dir7`. The directory seen should be the same one as the working directory on `host1`.

It is also possible to use only two entries for each host in the host file (host name and number of processes). This requires that the working directory is shared and that the sharing information is up to date in the file `tools\marc.net` in the Marc installation directory.

## Distributed I/O

If the user wants to have the I/O to be local on `host2`, specify the host file as

```
host1 1
host2 1 D:\users\dir5
```

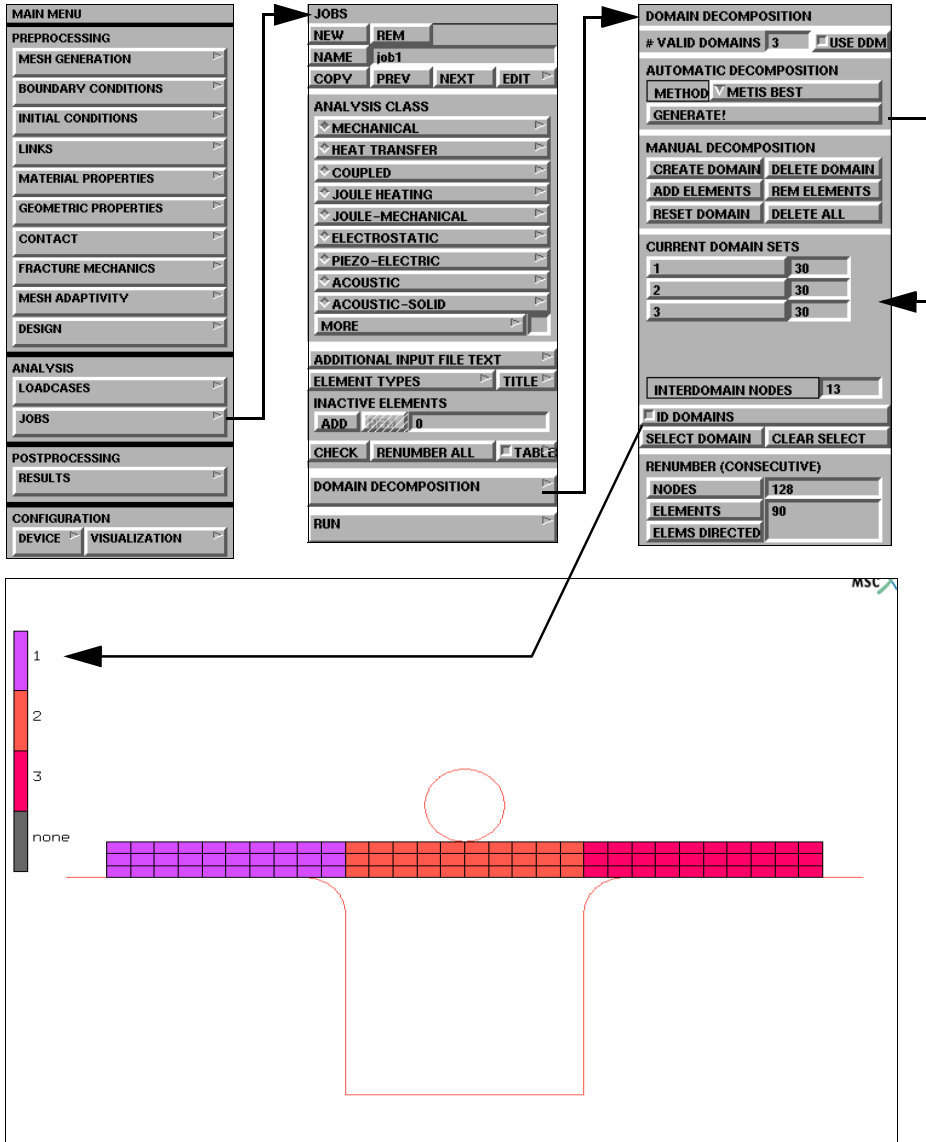
The I/O on `host2` will now take place in the directory `D:\users\dir5` on the hard disk of `host2`. For this case, the Marc input files are transferred to `D:\users\dir5` on `host2` before the job is started, and the results files are transferred back after the analysis for postprocessing. This transfer of files is done by Marc automatically.

## Example

The definitions for a network run with Mentat is demonstrated with a simple example. We assume the simplest case where both the working directory and installation directories are shared.

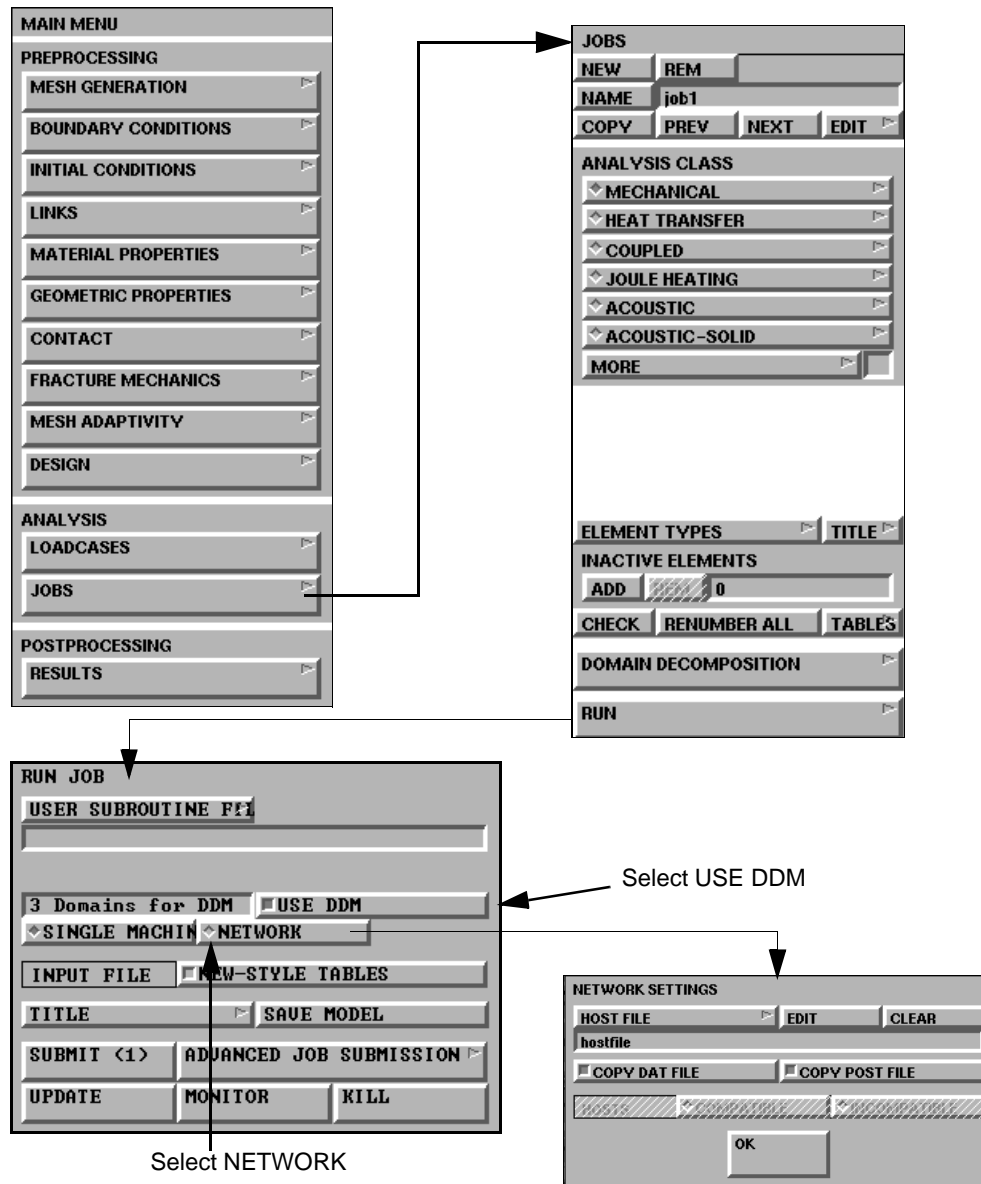
Enter the menu **HELP->RUN A DEMO PROBLEM** and select the example **CONTACT WITH DDM**. Select and confirm your three domains as shown below.

### Step 1



Activate DDM and enter the **NETWORK SETTINGS** menu.

## Step 2



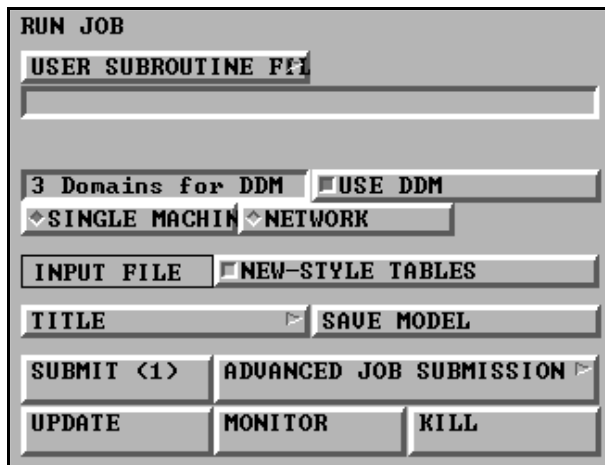
Click on the HOST FILE button and select the file called hostfile and modify it to contain:

```
host1 2
host2 1  \\host1\...
```

Set the working directory according to the share names on the current system. The host file places two domains on host1 and one domain on host2.

Run Marc from within Mentat using the SUBMIT 1 button.

### Step 3



The screenshot shows a 'RUN JOB' dialog box with the following elements:

- USER SUBROUTINE FILE**: A text input field.
- 3 Domains for DDM**: A text input field.
- USE DDM**: A checkbox.
- SINGLE MACHINE** and **NETWORK**: Two radio buttons, with 'NETWORK' selected.
- INPUT FILE**: A text input field.
- NEW-STYLE TABLES**: A checkbox.
- TITLE**: A text input field.
- SAVE MODEL**: A checkbox.
- SUBMIT <1>**: A button.
- ADVANCED JOB SUBMISSION**: A checkbox.
- UPDATE**, **MONITOR**, and **KILL**: Three buttons at the bottom.

Check your results.

Step 4

MAIN MENU

PREPROCESSING

MESH GENERATION

BOUNDARY CONDITIONS

INITIAL CONDITIONS

LINKS

MATERIAL PROPERTIES

GEOMETRIC PROPERTIES

CONTACT

FRACTURE MECHANICS

MESH ADAPTIVITY

DESIGN

ANALYSIS

LOADCASES

JOBS

POSTPROCESSING

RESULTS

POSTPROCESSING RESULTS

FILE

model1\_job1.t16

OPEN DEFAULT

OPEN

CLOSE

MONITOR

SCAN

REWIND

PREV

NEXT

LAST

SKIP TO INC

SKIP INCS

DEFORMED SHAPE

SETTINGS

OFF

DEF ONLY

DEF & ORIG

SCALAR PLOT

SETTINGS

OFF

CONTOUR BANDS

CONTOUR CENT

CONTOUR LINE

SYMBOLS

NUMERICS

ISO-SURFACES

CUTTING PLANE

BEAM CONTOUR

BEAM VALUES

SCALAR

Total Equivalent Plastic Strain

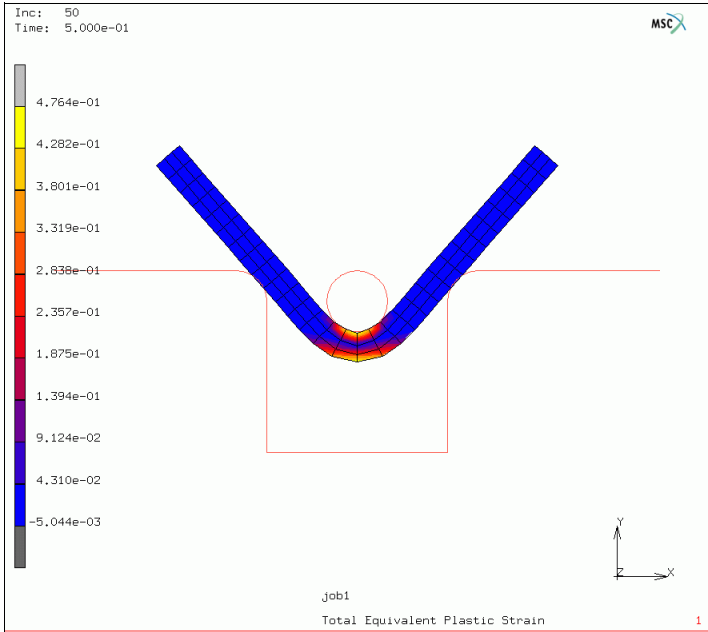
Open Default

Skip to Inc 50

Def Only

Contour Bands

Select "Total Equivalent Plastic Strain"



Marc creates a post file associated with each domain as well as a root post file associated with the job id. For the previous model, `1model1_job1.t19`, `2model1_job1.t19`, and `3model1_job1.t19` are the processor files, while `model1_job1.t19` is the root file.

To postprocess the entire model, select `model1_job1.t19` as the postprocess file. If the model is very large, it may be convenient to view only a portion of the model by selecting any one of the processor post files, such as `3model1_job1.t19`. This file contains only data associated with domain 3 as selected in the Domain Decomposition menu. As specified in the host file, this file was created by host2.

## Shared vs. Distributed I/O

For jobs with very large post or restart files, it is usually more efficient to use distributed I/O. With distributed I/O, the input files, and the post files are located on the host's local disks. Marc, by default, automatically transfers the input files and the post files to and from the remote host if needed. It is possible to suppress this transferring with two buttons in the Network settings in the JOBS menu in Mentat.

To run a job using distributed I/O, specify a local directory in the host file:

```
host1 2
host2 1    d:\workdir
```

## Jobs with User Subroutine

User subroutines can be used as usual. If local directories are used on remote hosts (distributed I/O), the new executable will be transferred automatically to the remote host if necessary.

## Solver

Solver type 6 (hardware provided sparse) is not available on the Microsoft Windows platform.

Solver types 0 (direct profile), 2 (sparse iterative), 4 (sparse direct), and 8 (multifrontal sparse) are supported in parallel.

Out-of-core solution is only supported in parallel for Solver 8.



# Troubleshooting

## General

Make sure that:

1. The user ID that was registered using the `wmpiregister.exe` utility exists on the root machine and all remote machines (see [Part 1 General Information](#)). Also check that the password you entered is the same on all machines.

Note that if you change your login password, you must register it again using `wmpiregister.exe`.

2. The remote machines have permission to read from the Marc installation on the root machine via the UNC sharename. For shared I/O, the remote machines also must have permission to read from and write to the shared (working) directory on the root host.
3. Your Marc and Marc Parallel licenses are valid.
4. The host names are valid.

5. The MPICH2 Process Manager service is installed and running on all hosts involved in the distributed job across the network. Select Start/Control Panel/Administrative Tools/Services and look for MPICH2 Process Manager, Argonne National Lab. Make sure that it has Status: Started.

The typical error message that appears if the Process Manager service is not running on or more hosts is:

```
abort: Unable to connect to 'hostname:8676'
sock error: generic socket failure, error stack:
...
```

Please refer to Step 3 of the installation instructions ([Part 2 Installation Notes](#)) on how to install the Process Manager on machines without a full Marc installation.

## Running a Parallel Job when not connected to the Network

If you disconnect your system from the network and want to run a parallel job on that system, you will have to install the Microsoft Loopback Adapter. Follow these steps:

**Go to Control Panel, Add/Remove Hardware.**

**Select the hardware task you want to perform:**

Add/Troubleshoot a device

**Choose a Hardware Device:**

Add a new device

**Do you want Microsoft Windows to search for your new hardware?**

No, I want to select the hardware from a list

**Select the type of hardware you want to install:**

Network adapters

**Select Network Adapter:**

Manufacturers: Microsoft  
 Network Adapter: Microsoft Loopback Adapter

It will now install the loopback adapter. You will have to enable/disable the loopback adapter as you remove/connect your machine to the network.

**Running a Parallel job on Windows XP System when not a member of a Domain**

If you will be running a parallel job on a Windows XP system that is not a member of a domain, you will have to modify a registry entry.

Using *regedt32*, look for the following key:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Lsa
    "forceguest" : REG_DWORD : 00000001
```

If you find this key, change the REG\_DWORD value to 0. The name may also appear as ForceGuest.

If you do not have this registry entry, your system will function properly.

**Running a Parallel Job on Windows XP SP2**

After you install or upgrade to Windows XP SP2, the RPC protocol does not permit anonymous requests to the RPC Endpoint Mapper but requires client requests be authenticated. This will cause an "Access is Denied" error when you attempt to run a Marc Parallel job.

---

**Note:** These settings are important to enable Microsoft Windows to run a parallel job. If they are not set properly, the error message "Host is unreachable (5)" or "Access is Denied (5)" will be issued.

---

To work around this problem, do the following:

From a command prompt, run **gpedit.msc**.

Select **Computer Configuration**,  
 expand **Administrative Templates**,  
 expand **System**,  
 click **Remote Procedure Call**,  
 double click **RPC Endpoint Mapper Client Authentication**.

Change the value to **Enabled**.

You will also need to check the Data Execution Prevention settings.

Right click **My Computer**  
 Go to **Properties**  
 Select the **Advanced** tab  
 Select the Performance **Settings** button  
 Select the **Data Execution Prevention** tab  
 Select the button for *Turn on DEP for essential Windows programs and services only*

## Required Privileges

Running a parallel job either locally or over a network requires certain user privileges. If the privileges are not sufficient, MPICH will print an error code of 1314.

You will need to check the following settings from the **Control Panel**:

Select **Administrative Tools**

Select **Local Security Policy**

Check the following items under **Local Policies->User Rights Assignment**.

Windows XP

"Adjust memory quotas for a process"

"Replace a process level token"

You can add usernames to these if needed by right clicking them and going to Properties.

Note that if they log in through a domain controller, the setting on the domain controller will also need to provide access to these settings for each username.

