
MLWorksTM

Version 2.0

Release Notes



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MLWorks™ Version 2.0 Release Notes

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Release Notes

1 Platforms

This section contains information that applies to both the UNIX and the Windows versions of MLWorks.

MLWorks 2.0 is supported on the following configurations of hardware and software. Please contact Harlequin if in any doubt about support for your platform.

- Intel x86 running Windows 95 or Windows NT 3.51 or 4.0
- Intel x86 running Linux version 2.0.30 or later, for example, Red Hat 4.x or 5.0.
- SGI MIPS R3000 running Irix 5.3
- SGI MIPS R4000 (revision 3.0 and higher) running Irix 5.3 or 6.2
- Sun SPARC running Solaris 2.4, 2.5, 2.5.1, or 2.6.

Sun Ultra machines must be running Solaris 2.5.1 or higher. If you are running Solaris 2.5.1, you also need kernel patch 103640-08 or a later revision, available from Sun to all service contract customers. This patch applies to all SPARC-based machines and has been integrated into future releases of Solaris.

If you use an earlier version of any of the above operating systems, please upgrade.

See also “Suggested minimum system configurations for MLWorks on Windows” on page 4 and “Suggested minimum system configurations for MLWorks on Linux and UNIX” on page 7 and “Suggested minimum system configurations for MLWorks on Linux and UNIX” on page 7.

2 How to reach Harlequin Support

The MLWorks 2.0 Installation Guide shows you how you can contact Harlequin Support.

3 Known problems

3.1 Windows object files need updating

Some object files created with the Windows version of MLWorks 1.0r2 do not work with MLWorks 2.0. You should delete your old object files and compile new ones.

3.2 The X keysym database in the MLWorks Linux runtime

You may have problems with the X keysym database if you are using the Linux version of MLWorks. It is possible that if your system’s `XKeysymDB` file is in an unusual place, you will see error messages such as the following:

```
Warning: translation table syntax error: Unknown keysym name:
osfActivate
```

```
Warning: ... found while parsing
'<Key>osfActivate:ManagerParentActivate()'
```

You can eliminate these problems by editing the `bin/mlworks` file and, before the `exec` statement, adding an entry for the `XKEYSYMDB` environment variable. For example:

```
XKEYSYMDB=/usr/lib/X11/XKeysymDB
export XKEYSYMDB
```

There may be an entry like this for `XKEYSYMDB` already, in which case you must edit that, or place your new entry after it. Substitute the correct path for your system's `XKEYSYMDB` file in the first line above. If you do not know where the file is located on your system, your systems administrator should be able to help. The following UNIX command may also locate the file for you:

```
find /usr -name XKeysymDB -print
```

3.3 Foreign interface library update at next MLWorks release

The next release of MLWorks will significantly rework the foreign interface library (FI). The new FI supports a wider range of datatypes, is more efficient, and is easier to use.

After the next version of MLWorks is released, Harlequin will offer support if you need to upgrade existing FI code to work with the new FI.

4 Features

4.1 The MLWorks implementation of Standard ML

The Definition of Standard ML (Milner, R.; Tofte, M.; Harper, R.; 1990; The MIT Press) was revised and simplified in 1996 by the original authors, and published in 1997. All major implementations of Standard ML are adapting to the revised definition, and MLWorks is no exception. By default, MLWorks uses the revised version of the language. Most existing code will compile unchanged. If the revisions to the Definition do cause you problems, MLWorks provides the option of using the previous definition. Select **Preferences > Options > SML '90**.

The full text of the revised Definition is now publicly available. We have permission from the authors to distribute selected pages that describe the changes to the language. See the file `sml_97.ps` in the distribution directory. This file is an excerpt from *The Definition of Standard ML (Revised)*, MIT Press, 1997, and is provided solely for use by the MLWorks license holder: it should not be distributed further.

4.2 The Standard ML Basis library

MLWorks also supports the Standard ML Basis Library. This library was developed by Harlequin in conjunction with the developers of Standard ML of New Jersey and the developers of Moscow ML. It provides a greatly expanded standard set of functions that are available in all up-to-date implementations of Standard ML. See the following URL for documentation:

<http://www.harlequin.com/devtools/ml/basis.htm>

MLWorks includes all the Basis library's required structures:

```
Array, BinIO, BinPrimIO, Bool, Byte, Char, CharArray, CharVector,  
Date, General, IEEE_Real, Int, IO, LargeInt, LargeReal,  
LargeWord, List, ListPair, Math, Old, OS, OS.FileSys, OS.IO,  
OS.Path, OS.Process, Position, Real, String, StringCvt,  
SubString, TextIO, TextPrimIO, Time, Timer, Vector, Word, Word8,  
Word8Array, Word8Vector
```

In addition, it includes the following optional structures:

```
Array2, CommandLine, Int8, Int16, Int32, Pack8Big, Pack8Little,  
Pack16Big, Pack16Little, Pack32Big, Pack32Little, RealArray,  
RealVector, RealArray2, SysWord, Windows, Word16, Word16Array,  
Word16Vector, Word32, Word32Array, Word32Vector
```

It also provides the optional `PrimIO` and `StreamIO` functors.

5 Windows platforms

This section discusses configuration and installation issues for the Windows 95 and Windows NT operating systems.

5.1 Suggested minimum system configurations for MLWorks on Windows

We recommend that you use an SGVA monitor with a resolution of 800x600 pixels or greater.

To run the Windows 95 version of MLWorks 2.0 we recommend at least 20 MB RAM. For running on Windows NT, we recommend at least 24 MB RAM.

The distribution directory for Windows 95 and Windows NT is 9 MB; the installed system takes up around 23 MB. Therefore, during installation you will need around 32 MB of free disk space.

The following notes present suitable system settings for running MLWorks on Windows. They should help you optimize the performance of MLWorks on your Windows system.

Ensure a reasonable amount of disk space. 64MB would be plenty for most applications.

You can control the memory usage by the `-limit n` option to the MLWorks runtime itself, and also by setting the swap characteristics of Windows. The settings depend on the sort of work you are doing, for example student work, running a medium-sized application, or large-scale software development (all figures in MB):

Table 1 Recommended Windows memory settings (in Megabytes)

	Personal	Professional (medium)	Professional (large)
~live data	16	24	32
~max. heap size	32	48	48 (no <code>-limit</code>)
suitable <code>-limit</code> value	32	48	64
~max. heap size	24	32	40 (with <code>-limit</code>)
suitable RAM	16	24	32
reserved swap	64	64	128
minimum swap	23	32	32

The `-limit` in Table 1 refers to the `-limit n` option to the MLWorks runtime, which specifies an advisory arena extent size in MB. The default is 100. If you have problems with memory usage, try this setting first, using the suggested *n* from the table above. To change it, edit the `mlworks` shortcut by choosing **Start > Settings > Taskbar**, then in the Taskbar properties dialog, choose **Start Menu Programs** and click on the **Advanced ...** button. This explores the start menu programs. Find and select the `mlworks` shortcut and choose **File > Prop-**

erties. Then choose **Shortcut**. The shortcut is presented in the Target text box, and can be edited there.

Reserved swap is how much disk space you should have available to your virtual memory system. This is what determines whether MLWorks will die from lack of memory.

Minimum swap is the smallest size you should allow your swap file to become. You can set this in the Control Panel under **System**. The operations necessary differ between Windows 95 and Windows NT.

On Windows 95, select the Performance page, then click on the **Virtual Memory...** button in the Advanced Settings pane. Then select the **Let me specify** radio button and fill out the fields appropriately.

On Windows NT, select the Performance page, then click on **Change...** in the Virtual Memory pane. Then fill out the fields appropriately.

If you still have trouble, we suggest using the Windows 95 System Monitor or Windows NT Performance Monitor.

In the Windows 95 System Monitor (**Start > Programs > Accessories > System Tools > System Monitor**), select **Edit > Add Item**. In the Category list, select Memory Manager, then from Items choose “Swapfile in use” and “Swapfile size”. Click **OK**.

In the Windows NT Performance Monitor (**Start > Programs > Administrative Tools [Common] > Performance Monitor**), select **Edit > Add to Chart**. Choose “Paging File” from the Object drop-down list and “%Usage” from the Counter drop-down list. Click **Add**.

The next thing to do is to monitor the chart while you are performing typical tasks in MLWorks. There is a danger that readings will disappear from the chart too quickly for you to interpret them. To avoid this, slow down the display by selecting **Options > Chart** and changing the “Update interval” slider setting (Windows 95) or Update Time interval setting (Windows NT).

Diagnosis again differs between Windows 95 and Windows NT. On Windows 95, if the swapfile size goes up and down a lot, the minimum swapfile size should be increased. If the swapfile size does not go up and down at all, the minimum swapfile size could be reduced. A suggested number in either case is 4/3 of the peak value of “Swapfile in use”.

On Windows NT, if the paging file usage stays very low, your PC is not paging very much and you need not make changes. If the usage gets very high, you need to reduce the value of `-limit` used by the MLWorks runtime, or reduce the maximum paging file size, or do fewer tasks at once.

Also of interest for monitoring on Windows NT is the “Memory” object and its “Page Faults/sec” counter. If this remains high (over 100, say; though the exact number depends on your PC) for a prolonged period, you are thrashing and need to reduce your `-limit`, get more physical memory, or do fewer tasks at once. Note that the Performance Monitor graphs are scaled independently of each other.

5.2 The MLWorks.Deliver.deliver function

When using `MLWorks.Deliver.deliver` on Windows, MLWorks exits after delivering the application executable.

5.3 New Start menu shortcuts require HTML browser

MLWorks 2.0 includes **Start**-menu shortcuts that invoke an HTML browser on HTML versions of the *MLWorks User Guide* and the *MLWorks Reference Manual*.

MLWorks does not include an HTML browser. If you do not have a browser installed, these shortcuts will have no effect.

6 Linux and UNIX platforms

This section contains information that applies only to the Linux and UNIX versions of MLWorks.

6.1 Suggested minimum system configurations for MLWorks on Linux and UNIX

To run the Irix version of MLWorks 2.0, we recommend at least 32 MB RAM. The distribution directory for Irix is around 13 MB; the installed system takes up around 18 MB. Therefore, during installation you will need around 31 MB of free disk space.

For running on Solaris, we recommend at least 32 MB RAM. The distribution directory for Solaris is around 11 MB; the installed system takes up around 18 MB. Therefore, during installation you will need around 29 MB of free disk space.

For running on Linux, we recommend at least 32 MB RAM, and Red Hat Linux version 4.0 or later. Although we do not support other versions of Linux, users have reported no problems. The installed system takes up around 15 MB without documentation, and 22 MB including documentation.

6.2 Window-system support

MLWorks 2.0 runs under the X Window System with Motif, and under Sun's OpenWindows for Solaris. MLWorks also supports the Common Desktop Environment (CDE).

MLWorks 2.0 for Linux runs under the X Window System with Motif. The Motif libraries are statically linked into the MLWorks runtime. You do not need to own Motif in order to run MLWorks.

6.3 Window manager window-closing operations

MLWorks ignores the UNIX window manager's window-closing operation. This operation has different names in different window managers; in TWM it is called `f.delete`, and in MWM, it is called `f.kill`.

The MLWorks debugger tool uses an event-handling sub loop, and exiting a parent tool while MLWorks is in such a loop can cause problems. Therefore, MLWorks ignores all attempts to exit tools by using the window-manager's window-closing operation.

6.4 Motif-based applications must run with MLWorks resources

You must run Motif applications in an environment in which the value of the `XUSERFILESEARCHPATH` environment variable includes the

```
app-defaults/MLWorks-mono
```

file distributed with MLWorks.

The following commands work in the bash shell. Replace *<MLWorks>* with the directory in which you installed MLWorks:

```
XUSERFILESEARCHPATH=<MLWorks>/lib/X11/app-
defaults/%N%C:$XUSERFILESEARCHPATH
export XUSERFILESEARCHPATH
```

6.5 The MLWorks runtime

The UNIX MLWorks runtime uses X Window System libraries and Motif libraries. On Solaris both statically and dynamically linked versions of the runtime are available. On Irix, only a dynamically linked runtime is available. On Linux, only a statically linked runtime is available.

This section lists shared library requirements for the dynamic version of the runtime on all platforms, and, for Solaris, how to install the static or dynamic runtime according to your preference. It also explains how to recover from problems with the X keysym database that you may have on Solaris if you use the static runtime (which is installed by default on those platforms).

6.5.1 Solaris

On Solaris 2.4 and Solaris 2.5, MLWorks expects to find the OpenWindows versions of X11 and Xt, as distributed with Solaris by Sun. To ensure this, the scripts that run MLWorks add `/usr/openwin/lib` to your `LD_LIBRARY_PATH` environment variable.

Dynamically linked runtimes for MLWorks are shipped in the MLWorks 2.0 distributions for Solaris. If you would prefer the dynamic runtime to be installed by default, you can edit the installation script to make that happen. The following shared libraries must be available on your system for the dynamically linked runtime to work:

Solaris	libm.so.1, libw.so.1, libXt.so.4, libX11.so.4, libXm.so.2.12, libsocket.so.1, libnsl.so.1, libintl.so.1, libelf.so.1, libdl.so.1, libc.so.1
---------	---

To install the dynamically linked version of `m1run` instead of the statically linked one, edit the `install-mlworks` script in the MLWorks distribution, and go to the line which reads:

```
RUNTIME=main-static
```

Change the line to read:

```
RUNTIME=main
```

Now follow the installation procedure normally.

6.5.2 Irix

The default installation procedure for Irix installs a version of the MLWorks runtime, `mlrun`, that is dynamically linked to X Window System libraries and Motif libraries. The following shared libraries must be available on your Irix system for the runtime to work:

Irix	libX11.so.1, libXext.so, libXm.so.1, libXmu.so, libXt.so, libc.so.1, libm.so
------	---

If you do not have access to these libraries on your system, please contact Harlequin MLWorks Support.

We do not distribute a statically linked Irix runtime.